
City of El Segundo



Municipal Greenhouse Gas Emissions Inventory Report

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City of El Segundo Emissions Inventory Report

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How to read this report:

The following emissions inventory report includes data for the years 1990, 2005, and 2007. It is organized however starting with the year 2005 because it is the baseline year that will be used to set emission goals. The next year discussed is 2007, an interim year that shows progress made since the baseline year. Lastly, 1990 data is included to review historical GHG levels. Emissions data located in the appendix D is organized in the same way to maintain consistency.

I. Executive Summary

A. Project Background

There are a number of actions taking place in the State of California with respect to climate change and the reduction of greenhouse gas emissions (GHG). With the passage of the California Global Warming Solutions Act of 2006 Assembly Bill (AB) 32 the State of California established a 'first-in-the-world' comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of GHG emissions. The legislation directs the California Air Resources Board (CARB) to oversee its implementation, requiring California to reduce its GHG emissions to 1990 levels by 2020. Local governments in the State of California have an important role to play in helping the State reach its reduction goals.

Since the passage of AB 32 the framework of emissions reduction strategies have been adopted in the AB 32 Scoping Plan. The Scoping Plan includes a range of actions both mandated and voluntary, providing the main strategies for California to meet its reduction goal. The plan encourages local governments to set a GHG reduction target and develop a plan of action for government and community-wide emissions. More recently, Senate Bill (SB) 375 provides a path to achieve AB 32 through transportation (one of the largest sources of GHG emissions) and land use strategies.¹ The bill takes a regional approach to achieving results and establishes a process for CARB to develop GHG emissions reduction targets for each region. While there is no specific number that a local government must reduce its emissions to, it is still crucial that local governments develop strategies to reduce their emissions and comply with regional targets as they develop.

The increasing interest in climate change has engendered South Bay communities to form active, involved citizen groups that have advocated that their cities begin the process of creating Climate Action Plans.² A number of South Bay cities signed the "Cool Cities" pledge³ including the City of El Segundo. By committing to reduce global warming emissions cities will be implementing solutions to make themselves more sustainable and energy efficient. In the spring of 2008 the South Bay Cities Council of Governments (SBCCOG) coordinated efforts to respond to AB 32 by assisting South Bay cities with the process of conducting a GHG emissions inventory. In this way, South Bay cities will be in a better position to respond to the challenges and impact legislation related to climate change. Additionally, GHG inventories will be a useful tool to help South Bay cities measure their progress to meet regional reduction goals.

South Bay cities began the process of assessing their GHG emissions by joining ICLEI—Local Governments for Sustainability, an international association of city and county governments that have made a commitment to sustainable development.⁴ Through ICLEI, South Bay cities gained access to tools and resources such as the Clean Air Climate Protection (CACP) software, which enables cities to quantify their emissions. By joining ICLEI and adopting a resolution, South Bay cities have committed to ICLEI's Five Milestone Climate Protection Methodology, which includes: conducting a baseline emissions inventory and forecast, adopting an emissions reduction target for the forecast year, developing a local Climate Action Plan, implementing the local Climate Action Plan, and monitoring and verifying results. These milestones are the five steps the City of El Segundo plans to take in order to reduce its

1 See appendix F for more information on Climate Change legislation.

2 ICLEI-Local Governments for Sustainability was formerly known as the International Council for Local Environmental Initiatives, defines a Climate Action Plan (CAP) as a set of policies and measures designed to meet emissions reduction targets by a designated target year. A CAP must include a timeline, breakdown of actions and estimated benefits of each action compared to the baseline, a description of financing mechanisms, and an assignment of responsibility to departments and staff, and should incorporate public awareness and education efforts.

3 The Cool Cities Pledge was developed to encourage cities to endorse the U.S. Mayors Climate Protection Agreement and create their own greenhouse gas reduction activities.

4 Visit the ICLEI website to learn more about the organization at http://www.icleiusa.org/about-iclei/iclei-by_region/california-region

impact on the environment and promote change within the community.

Another resource utilized to conduct the municipal inventory was the Local Government Operations Protocol (LGOP).⁵ The protocol was developed in partnership by ICLEI, the California Air Resources Board (CARB), the California Climate Action Registry (CCAR), and The Climate Registry (TCR) to enable local governments to measure and report emissions in a consistent and transparent way. The protocol is a program neutral guide that was developed so that cities can follow internationally recognized GHG accounting and reporting principles.

B. Purpose of Conducting a GHG Emissions Inventory

One of the first steps a city takes towards protecting the environment from global warming and promoting environmental stewardship is to identify and account for the sources of emissions in its own backyard including municipal and community-wide emissions. Conducting an emissions inventory creates a pathway for cities to develop emissions documentation to better manage foreseeable regulatory programs at the Federal, State or regional levels. By being proactive and creating this documentation cities can begin to refine the collection and management of emissions data thereby improving the quality of future inventories. A municipal inventory allows a city to quantify the emissions it is responsible for from individual buildings and facilities, vehicle fleet, transit, waste, etc., giving the City insight into the relationship between improving efficiency and reducing emissions. Once a municipal inventory has been completed a city can identify and evaluate specific areas within municipal operations that are inefficient to then target. Utilizing the inventory to document and formulate a plan of action to address these inefficiencies gives the City an opportunity to lead by example, and promote education and outreach within the community.

C. Scope of the GHG Emissions Inventory

To create an inventory, data was gathered for the years 1990, 2005, and 2007. The year 2005 was selected as the baseline year and will serve as a reference year to measure future progress and establish short-term and long-term reduction target years. Although an estimate of 1990 data is shown to capture historical GHG emissions, and where possible, to be used for the purpose of comparing data between years, a reduction target should be set from the baseline year. The year 2005 was chosen because it allowed the City to gather the earliest, most accurate and reliable data. Data was also collected for the year 2007. This year is considered an interim year to monitor energy use changes that may have occurred since the baseline year 2005. It is useful to review data from this year because it shows progress made that will count towards any reduction goal set. Additionally and where available, data was also collected from the year 1990 to estimate the City's historical GHG emissions at that time. The year 1990 is significant in that it represents a reference year for several key pieces of climate change legislation such as the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol agreement, and the U.S. Mayors' Climate Protection Agreement.⁶ However, it was difficult to find accurate data going back as far as 1990 and so comparisons have been made in areas where data is reliable. The precise emissions emitted in 1990 were unable to be determined, thus the decision was made to use the baseline year 2005 data as the benchmark for setting targets.

Following the LGOP guidance for local governments, the City selected an operational control approach to define its organizational boundaries. What this means is that the City identified what emissions it should account for in its municipal inventory based on what facilities and operations it owns or controls. The City's operational boundaries are used to establish and organize its emissions by "scopes."⁷ In this way, a city can separately account for its direct and

⁵The Local Government Operations Protocol can be viewed with this link http://www.climateregistry.org/resources/docs/protocols/industry/local-gov/lgo_protocol_september2008.pdf

⁶ See appendix F for descriptions on climate change legislation.

⁷ See section 3, Inventory Results Introductions for more information on scopes of emissions.

indirect emissions in a tiered fashion. It also establishes a foundation for following reporting standards in the LGOP.

The City gathered information from a variety of sources, including consumption data from utility companies, fuel data from internal city records, data on waste and other services from contract service providers. A characterization study from the California Integrated Waste Management Board was utilized to capture waste composition and employee commute surveys were administered to capture emissions data from vehicle miles traveled⁸ where no records were available. This data was then utilized to quantify GHG emissions. Following ICLEI program-specific requirements, this report is considered to be a Quick Action Report⁹ which entails reporting on 3 of the 6 internationally-recognized GHGs regulated under the Kyoto Protocol.¹⁰ The benefit of this reporting option is that it allows a city to capture the majority of its emissions while familiarizing staff with the process of conducting an inventory so that in the future a more detailed level of reporting can be accomplished. The more comprehensive report entails accounting for all 6 Kyoto Protocol Gases. When the City conducts its re-inventory to ensure that it is inline with its emission reduction goals, the City will be able to consider producing a comprehensive report by adding data on the additional gases.

D. Inventory Methodology

This Quick Action report includes municipal results for the three years inventoried; including detailed reports, located in appendix A, for each year, which shows the GHGs separately as prescribed by ICLEI in the LGOP. As a framework for this report, the LGOP was utilized as a resource as was the Local Government Operations Standard Inventory Report Template. ICLEI provided the technical assistance and the software to accomplish the municipal inventory. The CACP 2009 software is consistent with LGOP standards with respect to the emission coefficients¹¹ and methodology employed by the software to calculate the equivalent GHGs. It is important to note that GHG emissions with different global warming potential are shown as one roll-up number known as a carbon dioxide equivalent unit (CO₂e).¹² It helps to simplify by looking at just one number for climate action planning; however, ICLEI believes that the most accurate description of emissions requires separate accounting by scope,¹³ which can be found in appendix A of this report.

The inventory results should be thought of as an approximation of the GHG emissions emitted in the years inventoried. The results should be used as a policy and planning tool rather than a precise measurement of GHGs. All the data sources used to capture the equivalent emissions emitted, also referred to as activity data, have been noted in the appendix B. This shows transparency when accounting for emissions. Similarly, appendix C discloses the formulas and emissions factors used to arrive at the equivalent GHG emissions. To the extent possible, recommended data and methods in the LGOP were used, but in some cases the suggested alternative methods were necessary to use when recommended data could not be found, appendices B and C give a description of the data and methodologies used.

E. Key Highlights and Findings

- The City of El Segundo generated approximately 4,070 metric tons of CO₂e in the baseline year, 2005; this is

⁸ See Appendices B and C for a description of data sources and methodologies used.

⁹ To read more about ICLEI's Quick Action Report see Appendix C in the Local Government Operations Protocol. The Quick Action Report entails reporting only on Carbon dioxide (CO₂); Methane (CH₄); Nitrous oxide (N₂O).

¹⁰ The internationally-recognized greenhouse gases regulated under the Kyoto Protocol are Carbon dioxide (CO₂); Methane (CH₄); Nitrous oxide (N₂O); Hydrofluorocarbons (HFCs); Perfluorocarbons (PFCs); and Sulfur hexafluoride (SF₆), Local Government Operations Protocol, page 11.

¹¹ Coefficients or emissions factors as they are known are multiplied by the data in order to arrive at an equivalent GHG emissions number.

¹² Equivalent Carbon Dioxide (CO₂e) the universal unit for comparing emissions of different GHGs expressed in terms of the GWP of one unit of carbon dioxide, Local Government Operation Protocol, Glossary.

¹³ See ICLEI Reporting Requirements, Appendix C, Local Government Operations Protocol.

equivalent to the GHG emissions generated by electricity use of 564 homes for one year.¹⁴

- There was an overall 3.6% decrease in GHG emissions between the baseline year 2005 and the interim year 2007. This was largely due to a decrease in scope 2 emissions from electricity use.
- There was a 8.4% decrease in emissions related to electricity use and a 7.1% decrease in emissions related to natural gas use between the years 2005 to 2007.
- Results from the employee commute survey indicate 44.8% of respondents are interested in participating in a ridesharing program.
- Under a business-as-usual forecast, the City can expect emissions to rise to 4,231 metric tons of CO₂e by 2012 that is equivalent to the annual GHG emissions from 775 passenger vehicles; and 4,400 metric tons of CO₂e by 2015, equivalent to the annual GHG emissions from 806 passenger vehicles if the City does nothing to reduce its emissions.

E. Future Steps

The next step will be to conduct a community-scale inventory to assess GHG emissions related to residential, commercial, industrial, transportation, and waste sectors. Once completed, these inventories provide the basis for the creation of a Climate Action Plan, which will include measures and policies to reduce emissions in both municipal operations and through community actions.

Climate action work is important and with the municipal inventory complete, the City can select a short and long-term reduction target for municipal operations. Before deciding on a target, the City should review the business-as-usual forecast graph, located in section three, to see what its emissions will look like in the years 2012 and 2015. The City will also want to think about measures and policies that might be included in the climate action plan to reach an adopted goal. Located in section four, is a summary of the City's existing and planned efforts to get the process started. It is important to anticipate and leave enough time to achieve whatever goal is set. An example of a short-term reduction target might be 20% below 2005 baseline levels by the year 2012. In general, ICLEI recommends the further away a target year the more emissions the City will want to reduce. A good example of an end date of a long-term target that is in-line with the State's AB 32 target would be 2020. How the City goes about adopting a reduction target depends on what works best for the City.

Being proactive is the best way to curb GHG emissions and positively influence change within the community. The Climate Action Plan development requires several steps and may include creating a review committee, defining current measures, developing new measures, developing an implementation plan, community outreach strategies, and developing ongoing tracking. Now is a good time to consider what municipal measures and policies planned or existing should be included in the climate action plan. It is important to consider time, resources, cost, and the possible GHGs reduction scenario of each individual measure, as they will all be factors in the decision-making process for the City to reach its goals. The Environmental Advisory Committee is a good place to get the development of this process started.

Now that the first step has been taken, it is vital to continue to develop inventory reporting skills. It is up to the City how often they re-inventory GHG emissions, but ICLEI recommends doing so every few years to make sure the City stays on target to reach short and long-term goals. Refining the gathering and management of data for the next inventory should start with good internal communication between departments working together to ensure that the appropriate records are set aside or entered into the new ICLEI data collection forms. Working together is the best way to fine tune reporting skills and work towards creating a comprehensive report as outlined in the LGOP under ICLEI program requirements.

¹⁴ The EPA Greenhouse Gas Equivalencies Calculator was utilized to help visualize and understand GHG emission results.

II. Local Government Profile Information

A. Local Government Description

The City's General Plan includes goals to 1) Beach Preservation-to ensure long-term public access to a safe, clean beach environment within and adjacent to the City; 2) Water Supply-Assist in the maintenance of a safe and sufficient water supply and distribution system that provides for all the water needs within the community; 3) Groundwater contamination-Protect groundwater and coastal waters from contamination; 4) El Segundo Blue Butterfly-Protect the rare and endangered El Segundo Blue Butterfly; 5) Urban Landscape-Develop programs to protect, enhance, and increase the amount and quality of the urban landscape to maximize aesthetic and environmental benefits.

Local Government History

The City of El Segundo is home to approximately 17,000 people (over 7,000 families), bounded on the north by Los Angeles International Airport, on the south by the Chevron El Segundo refinery, and on the west by the Pacific Ocean. The five-square-mile community also boasts a variety of businesses that include Fortune 500 firms Chevron, The Boeing Company/Satellite Systems, Mattel, NCR, Xerox, Northrop Grumman, Raytheon, DirecTV, EDS, Oracle, SAIC, Sun Microsystems, Time Warner Cable, and Computer Sciences Corporation. It is also home to thousands of smaller businesses, and has a thriving retail sector. The work-day population of El Segundo has been estimated at more than 80,000. In 2006, El Segundo won an Eddy award for being the most business friendly city in Los Angeles county.

Primary Services

Department	Primary Services
Administration	General Administration –City Clerk, City Manager, City Council , Human Resources and Finance.
El Segundo Police Department	Police Administration consists of the following Divisions and Sections: Administrative Division, Personnel Division, Support Services Division, Professional Standards Division, Records Section, Communications Section, Community Relations Section, Information Technology Section, and the Purchasing and Budget section provides safety and security within the community.
Fire Services	The Administration Division's function is to administer all Fire Department operations, which include: Fire Suppression, Paramedic/Emergency Medical Service, Fire Prevention, Emergency Services, Hazardous Materials Management/Environmental Safety, Training, and Public Education Programs.
Streets	The Street Maintenance Division is responsible for: the repair of streets and alleys and weed abatement in the street right-of-way and on private property inspected by the Fire Department; repair and/or replace curb and concrete sidewalks as well as asphalt road surfaces; cleaning spills of various materials, except hazardous waste, in the public right-of-way; responding to emergencies with lighted barricades and signs. The Division shares responsibility with the Engineering Division for Public Works permit inspections.
Planning	The Planning Division's primary responsibility is planning the future land use for the city. This division analyzes data and makes recommendations to the Planning Commission and City Council. Planning is responsible for the development and implementation of the General Plan, land use regulations through zoning and subdivision codes, and environmental impact assessment. The Planning Division also administers the Community Development Block Grant Program (CDBG) and the Air Pollution Reduction Fund. The Code Compliance program is administered jointly with the Building Safety Division. Division services include Amplified Noise Permits, Animal Permits, Alcohol Beverage Permits, Conditional Use Permits, Variances, Environmental Assessments, Minor Home Repair Program, Senior In-Home Care Program, Juvenile Diversion Program, Census information,

	Zoning and street maps.
Building & Safety	<p>The Building Safety Division is responsible for the health, safety and welfare of the public as it relates to buildings and structures on private property. Through the enforcement of adopted codes, the Building Safety Division enforces building, plumbing, mechanical, electrical installations and accessibility and energy compliance. In addition, field inspections of existing structures are made for unsafe, unsanitary and/or dilapidated conditions. A team approach to the design, plan review, and construction process has been implemented in cooperation with the Planning Division, Economic Development, other City Departments and Public agencies. The Building Safety Division plan checks for code compliance and performs field inspections to ensure conformity with City and State regulations. Staff performs plan review, permitting, and inspections.</p>
Public Works/Engineering	<p>The Engineering Division is one of several divisions in the Public Works Department. The Division, headed by the Director of Public Works/City Engineer, oversees 1) public and private improvements in the public right-of-way; 2) the development and implementation of the Capital Improvement Program by providing staff support to the Capital Improvement Program Advisory Committee (CIPAC) relative to City streets, sanitary sewer, storm drains, water system facilities, traffic signals, park and recreational facilities; and 3) the maintenance/upgrade of public infrastructure. The Division also provides services related to traffic issues, monitors the street lighting system maintained by Southern California Edison Company, keeps and maintains record drawings of City-owned infrastructure, conducts traffic committee meetings with the Police Department, and provides engineering support to other City Departments and other Divisions within the Public Works Department.</p>
Recreation & Parks	<p>The Recreation and Parks Administrative Division's function is to facilitate problem solving and identify critical community issues. El Segundo is an engaging community, and as such, our residents come together to interact socially, recreationally, culturally, and competitively; we provide opportunities for these types of interactions.</p> <p>We also promote safety and security through safe environments to play and socialize, and by offering programs that reduce criminal or anti-social behavior. We provide administrative oversight for all recreation and parks activities including parks, recreation, transportation, cable television, golf operations, youth counseling and senior housing.</p>

III. Municipal Emissions Inventory Results

A. Inventory Introduction and Results

Depicted in this section are tables and graphs that represent and illustrate an approximation of the GHG emissions levels for the three years of data collected. As mentioned in the executive summary, the data findings are expressed in CO₂-equivalent, which is an estimated sum or roll-up number for GHGs with different global warming potential,¹⁵ to make it easier to review, plan, and set targets. Appendix A gives a detailed account of individual GHGs separately, by scope, for the purpose of establishing good reporting habits. Based on LGOP reporting standards, GHG emissions are organized according to their scope.¹⁶ Scopes are determined based on what control approach¹⁷ a local government chooses to define its boundaries. The LGOP recommends an operational approach for local governments wherein a city defines its scopes by what they own and operate. In this way, the City can account for direct and indirect emissions separately.

Direct emissions are associated with scope 1 and are deemed within the City's control. They are generated by fixed equipment used to produce heat or power from the stationary combustion process and mobile combustion of fuels from city fleet vehicles.

Cities also have a level of control over activities that are associated with indirect emissions, known as scope 2. These emissions are associated with the consumption of purchased electricity, steam, heating, or cooling.¹⁸ The difference between the scopes is that these sources are owned or controlled by another entity. Still, a city will want to develop measures to reduce emissions within this scope. Indirect emissions are also associated with scope 3, however scope 3 emissions are related to activities that the City does not own or operate, such as emissions from contracted services, employee commuting, or waste disposal. As an ICLEI member, scope 3 reporting is considered optional, but good to include, as it may be policy relevant. City staff decided what data to include for contract providers (Scope 3 emissions) based on whether the information was obtainable, reliable, and relevant.

Tables 1 through 3 are organized by scope, sector, and source of emissions. The data is shown in metric tons of CO₂-equivalent, adjacent is the percentage represented by each sector, source of emissions, energy use in one million British thermal units, and the cost where applicable. This information is shown for the purpose of targeting, planning, and then tracking energy and cost-saving measures. To learn where specific data was obtained and how it was computed, refer to the appendices sections B and C.

2005

Baseline Year

Results from the 2005 municipal inventory represent the year chosen as a baseline year, which will serve as a foundation for setting short and long-term emissions reduction targets. For this year, there was adequate data available to conduct an accurate inventory. It is important to keep in mind that scope 3 emissions included in the baseline year are estimates based upon information provided by contract service providers and from surveying employees and should not be thought of as a precise measurement of GHGs, but rather as policy relevant information that the City may want to consider when developing or evaluating measures or policies.

¹⁵ Each greenhouse gas has a different global warming potential based on its ability to trap heat in the atmosphere, CO₂e is the universal unit for comparing emissions of different GHGs global warming potential, see LGOP appendix E, page 166 for more details.

¹⁶ The Local Government Operations Protocol follows categorization standards developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD).

¹⁷ Definitions of inventory approaches are discussed in the LGOP, page 14.

¹⁸ See Local Government Operations Protocol for details, page 22.

In 2005, the City of El Segundo GHG emissions totaled 4,070 metric tons of CO_{2e}. This number includes both direct and indirect sources of emissions, as shown in Table 1. This total is equivalent to the GHG emissions emitted from the electricity use of 564 homes for one year. Looking at the scopes within the table, the second largest portion 32.4% (scope 1 total) were emissions generated from a combination of natural gas use for buildings and facilities, water delivery, and fuel for City vehicles. Approximately 139 vehicles, non-highway vehicles, and equipment from 18 departments were included in the make up of this total.¹⁹ Electricity usage accounted for 44.3% (scope 2 total) of the total emissions. The smallest portion 23.3% (scope 3 total) were emissions due to a combination employee commute (see appendix E for employee commuting details) and waste (refuse collected from City bins).

Energy/Fuel use and cost information has been listed for the purpose of planning and tracking energy measures' cost effectiveness. During 2005, the City of El Segundo used 5,929,134 kWh of electricity at a cost of \$708,093. In this same year, the City consumed 103,414 therms of natural gas costing \$104,553.

Table 1. Municipal Inventory Summary 2005 ²⁰

El Segundo Municipal GHG Emissions 2005						
Sector	MT CO _{2e}	Percent CO _{2e} (% CO _{2e})	Source	Energy/Fuel Use	Energy/Fuel Use Cost	Energy Equivalent (MMBtu)
Scope 1 Emissions						
Buildings & Facilities						
Buildings & Facilities	550	13.5%	Natural Gas	103,414 therms	\$104,553	10,341
City Vehicle Fleet						
City Vehicle Fleet ²¹	758	18.6%		-	\$179,197	10,477
	589		Gasoline	65,327 gallons	\$142,055	8,127
	130		Diesel	12,674 gallons	\$26,803	1,759
	39		Propane	6,452 gallons	\$10,339	591
Water Delivery						
Pump Stations	11	0.3%	Natural Gas	2,043 therms	\$2,658	204
Total Scope 1 Emissions	1,319	32.4%	-	-	\$286,408	21,022
Scope 2 Emissions						
Buildings & Facilities						
Buildings & Facilities	827	20.3%	Electricity	2,722,360 kWh	\$310,677	9,291
Streetlights & Traffic Signals						
Traffic Signals/Controllers	120	2.9%	Electricity	394,419 kWh	\$46,931	1,346
Streetlights ²²	480	11.8%	Electricity	1,578,255 kWh	\$226,594	5,387
Park Lighting	110	2.7%	Electricity	360,789 kWh	\$20,680	1,231
Other Outdoor Lighting ²³	68	1.7%	Electricity	224,049 kWh	\$16,112	765
Water Delivery						
Sprinkler/Irrigation Control	7	0.2%	Electricity	22,925 kWh	\$5,699	78

¹⁹ Fuel data was unknown for approximately seven vehicles and four pieces of equipment therefore these items were excluded from the 2005 inventory.

²⁰ See appendix D, Emissions Data, to review individual energy use and cost per item.

²¹ See appendix D, Emissions Data, to review fuel emissions per department; both highway vehicles, non-highway vehicles, agricultural and/or construction equipment have been included in the City Fleet category.

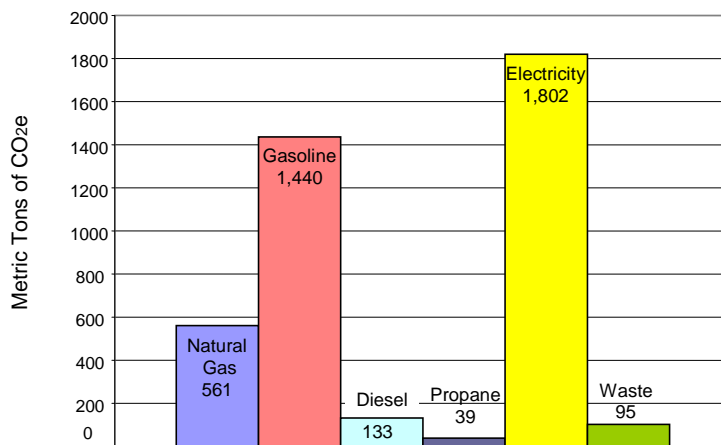
²² City owned streetlights and Southern California Edison owned streetlights have been combined in the total shown here. See appendix D, Emissions Data, to review individual emissions in the Streetlights and Traffic Signals category.

²³ Tree Wells-up lighting, Field lighting, City Parking Lot Lighting/Misc., and Decorative Lighting have been combined in the total shown here. See appendix D, Emissions Data, to review individual emissions in the Streetlights and Traffic Signals category.

Water Delivery Facilities ²⁴	187	4.6%	Electricity	614,863 kWh	\$78,626	2,098
Park Irrigation	3	0.1%	Electricity	11,474 kWh	\$2,774	39
Total Scope 2 Emissions	1,802	44.3%	-	5,929,134 kWh	\$708,093	20,235
Scope 3 Emissions						
Employee Commute						
Employee Commute	854	21%	-	1,653,428 VMT	n/a	11,776
	851		Gasoline	1,647,163 VMT		11,727
	3		Diesel	6,265 VMT		49
Solid Waste						
Waste	95	2.3%		375 tons	n/a	n/a
Total Scope 3 Emissions	949	23.3%	-	-		11,776
Total Emissions	4,070	100%	-	-	\$994,501	53,033

Figure 1 illustrates emissions by source. The highest sources of emissions were from electricity use followed by gasoline and natural gas. Propane was the lowest source of emissions. Waste resulted in the fifth lowest source of emissions. It was estimated that 375 tons of waste generated by city operated and owned facilities was sent to a landfill. A breakdown of the waste composition can be found in appendix D, based on a solid waste characterization study for public administration from the California Integrated Waste Management Board website.

Figure 1. Emissions by Source 2005
(including all direct and indirect sources)



Figures 2 and 3 illustrate a percentage breakdown of each sector from Table 1. ICLEI asks its members to report on scopes 1 and 2 where scope 3 is optional; therefore, data below is organized to reflect this criteria. Figure 2 shows all scopes, where as Figure 3 concentrates only on scopes 1 and 2 – functions that a city has more influence on. Figure 2 shows all scopes, where as Figure 3 concentrates only on scopes 1 and 2 – functions that a city has more influence on. Figure 2 indicates 2.3% of emissions are from waste and 21% are the result of employee commuting. While a city may not have the same degree of control over this source, there is still an opportunity to create initiative programs or policies that will engender climate-friendly practices. Figure 3 is comprised of natural gas, fuels, and electricity generated emissions. Electricity in scope 2 accounts for 57.9% of emissions and scope 1 emissions from fuel and natural gas sources accounts for the remaining 42.1% of emissions.

²⁴ The Hydroelectric Station and Pumping Stations have been combined in the total shown here. See appendix D, Emissions Data, to review individual emissions in the Water Delivery category.

Figure 2. Emissions by Sector 2005
(including all direct and indirect sources from scopes 1, 2, & 3)

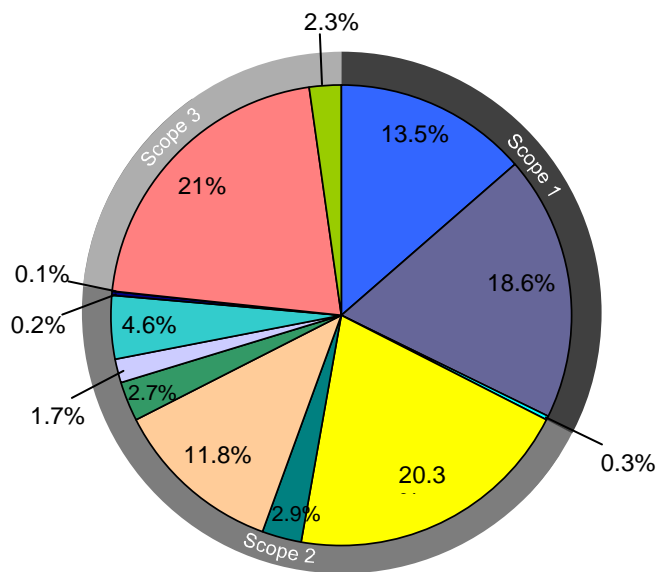
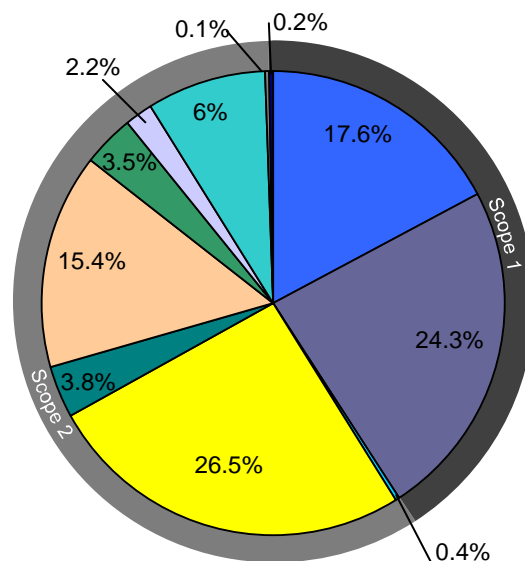


Figure 3. Emissions by Sector 2005
(including only direct and indirect sources from scopes 1 and 2)



Buildings & Facilities (natural gas)	City Vehicle Fleet	Park Irrigation	Buildings & Facilities (electricity)
Traffic Signals & Controls	Employee Commute	Park Lighting	Other Outdoor Lighting
Water Delivery (electricity)	Streetlights	Water Delivery (natural gas)	Sprinkler/Irrigation Control
			Waste

2007

Interim Year

The year 2007 was chosen as an interim year to review any energy use changes that may have occurred since the baseline year. ICLEI recommends cities re-inventory every year or two (or as often as possible) to ensure the City is keeping on track with its target. As with the data in 2005, the table below is organized by scope, sector, source of emissions, energy use, and the cost to capture a broad picture of the data.

In 2007, the City of El Segundo GHG emissions totaled 3,923 metric tons of CO₂e including both direct and indirect sources of emissions—this total is equivalent to the emissions produced from 445,289 gallons of gasoline consumed. The year 2007 represents an overall 3.6% decrease in emissions from the baseline year. Looking at the scopes within the table, emissions generated from natural gas and fuel sources accounted for 34.3% (scope 1 total) of the emissions inventoried in 2007. The City consumed 97,513 therms of natural gas costing \$91,040. Emissions from scope 1 rose from the baseline year due to an increase in fuel use. Approximately 155 vehicles, non-highway vehicles, and equipment from 18 departments make up this total.²⁵ Emissions from electricity use decreased from the baseline year contributing 42.1% (scope 2 total) to the total emissions. The smallest portion of emissions came from the employee commute and waste categories at 23.7% (scope 3 total).

Table 1. Municipal Inventory Summary 2007

²⁵ Fuel data was unknown for approximately twenty-two vehicles and three pieces of equipment therefore these items were excluded from the 2007 inventory.

El Segundo Municipal GHG Emissions 2007						
Sector	MT CO _{2e}	Percent CO _{2e} (% CO _{2e})	Source	Energy/Fuel Use	Energy/Fuel Use Cost	Energy Equivalent (MMBtu)
Scope 1 Emissions						
Buildings & Facilities						
Buildings & Facilities	519	13.2%	Natural Gas	97,513 therms	\$91,040	9,751
City Vehicle Fleet						
City Vehicle Fleet ²⁶	822	21%		-	\$232,432	11,400
	609		Gasoline	67,618 gallons	\$175,885	8,399
	150		Diesel	14,825 gallons	\$36,671	2,057
	63		Propane	10,308 gallons	\$19,876	944
Water Delivery						
Water Delivery Facilities	2	0.1%	Natural Gas	362 therms	\$1,079	36
Total Scope 1 Emissions	1,343	34.3%	-	-	\$324,551	21,187
Scope 2 Emissions						
Buildings & Facilities						
Buildings & Facilities	776	19.8%	Electricity	2,651,973 kWh	\$344,020	9,051
Streetlights & Traffic Signals						
Traffic Signals/Controllers	97	2.5%	Electricity	331,898 kWh	\$44,525	1,133
Streetlights ²⁷	468	11.9%	Electricity	1,598,956 kWh	\$282,154	5,457
Park Lighting	108	2.8%	Electricity	368,915 kWh	\$82,058	1,259
Other Outdoor Lighting ²⁸	24	0.6%	Electricity	328,565 kWh	\$40,402	275
Water Delivery						
Sprinkler/Irrigation Control	4	0.1%	Electricity	12,971 kWh	\$4,638	44
Water Delivery Facilities ²⁹	169	4.3%	Electricity	577,955 kWh	\$86,510	1,972
Park Irrigation	4	0.1%	Electricity	12,147 kWh	\$3,024	41
Total Scope 2 Emissions	1,650	42.1%	-	5,883,380 kWh	\$887,331	19,232
Scope 3 Emissions						
Employee Commute						
Employee Commute	833	21.2%	-	1,652,093 VMT	n/a	11,518
	831		Gasoline	1,647,651 VMT		11,481
	2		Diesel	4,442 VMT		37
Solid Waste						
Waste	97	2.5%	-	382 tons	n/a	n/a
Total Scope 3 Emissions	930	23.7%	-	-		11,518
Total Emissions	3,923	100%	-	-	\$1,211,882	51,937

Figure 4 shows an increase in emissions from fleet sources and waste while emissions from electricity and natural

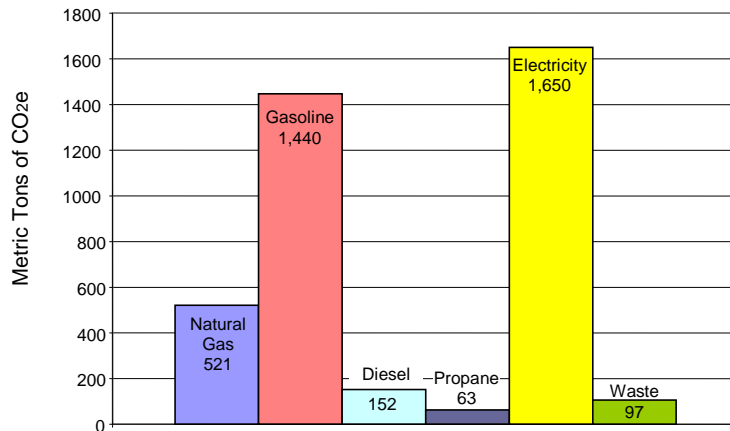
26 See appendix D, Emissions Data, to review fuel emissions per department; both highway vehicles, non-highway vehicles, agricultural and/or construction equipment have been included in the City Fleet category.

27 City owned streetlights and Southern California Edison (SCE) streetlights have been included in the Streetlights category. See appendix D, Emissions Data, to review individual emissions in the Streetlights and Traffic Signals category.

28 Tree Wells-up lighting, Field lighting, City Parking Lot Lighting/Misc., and Decorative Lighting have been combined in the total shown here. See appendix D, Emissions Data, to review individual emissions in the Streetlights and Traffic Signals category.

29 The Hydroelectric Station and Pumping Stations have been combined in the total shown here. See appendix D, Emissions Data, to review individual emissions in the Water Delivery category.

gas sources decreased. It was estimated that 382 tons of waste generated by city operated and owned facilities was sent to a landfill.



Similar to 2005, Figures 5 and 6 illustrate a percentage breakdown of each sector from Table 2. Figure 5 indicates 2.5% of emissions are from waste and 21.2% resulted from employee commuting. Figure 6 shows electricity in scope 2 accounts for 55.1% of emissions and fuels and natural gas from scope 1 contributed to the remaining 44.9% of emissions.

Figure 5. Emissions by Sector 2007
(including all direct and indirect sources from scopes 1, 2, & 3)

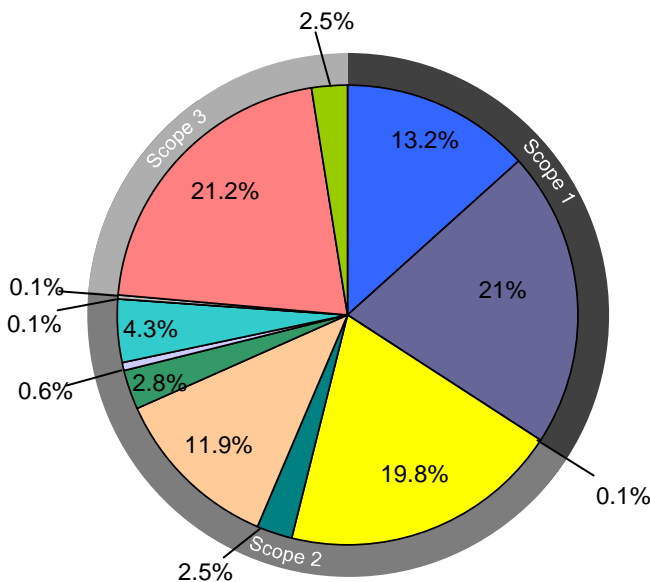
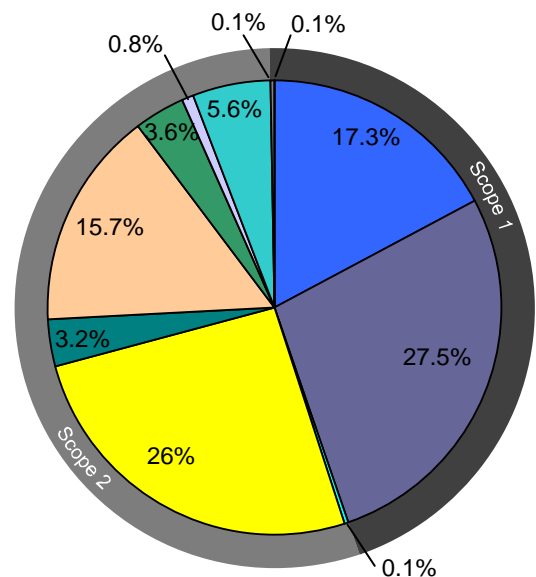


Figure 6. Emissions by Sector 2007
(including only direct and indirect sources from scopes 1 and 2)



1990

Historical Year

Looking back to 1990, this year is a benchmark for several key pieces of climate change legislation, such as the Kyoto Protocol as mentioned in the executive summary. Located in appendix F are brief descriptions pertaining to some of the historical policies that have set 1990 as a benchmark for reducing GHG emissions. Data was collected for this year to review, where possible, the historical GHG levels; however, it was difficult to find accurate data, with the exception of electricity, and “back-casting” or creating a rough estimate of emissions is not recommended in the LGOP.³⁰ Therefore comparisons have been made in areas where data is reliable. As suggested in the protocol, it is better to concentrate on developing a high-quality, comprehensive inventory with reliable data rather than back-casting to 1990 and therefore the reduction target should be set from 2005 levels.

Based on the data that was available for 1990, the GHG emissions identified totaled 2,496 metric tons of CO₂e, as shown in Table 3. Scope 2 totaled 2,493 metric tons of CO₂e, this amount is equivalent to the annual GHG emissions from 457 passenger vehicles. Electricity emissions from buildings and facilities were the highest equal to 1,907 metric tons of CO₂e. Only partial records were found for natural gas, 3.03 metric tons of CO₂e reflects the emissions based on casual records from the Southern California Gas Company.

Table 3. Municipal Inventory Summary 1990

El Segundo Municipal GHG Emissions 1990						
Sector	MT CO ₂ e	Percent CO ₂ e (% CO ₂ e)	Source	Energy/Fuel Use	Energy/Fuel Use Cost	Energy Equivalent (MMBtu)
Scope 1 Emissions						
Buildings & Facilities						
Buildings & Facilities ³¹	3	0.1%	Natural Gas	570 therms	n/a	34
Water Delivery						
Water Delivery Facilities	.03	0%	Natural Gas	6 therms	n/a	1
Total Scope 1 Emissions	3.03	0.1%	-	576 therms	-	35
Scope 2 Emissions						
Buildings & Facilities						
Buildings & Facilities	1,097	44%	Electricity	2,334,555 kWh	\$231,826	7,968
Streetlights & Traffic Signals						
Traffic Signals/Controllers	375	15%	Electricity	798,548 kWh	\$80,553	2,725
Streetlights ³²	739	30%	Electricity	1,573,017 kWh	\$225,535	5,369
Other Outdoor Lighting ³³	0	0%	Electricity	107 kWh	\$360	1
Water Delivery						
Sprinkler/Irrigation Control	25	1%	Electricity	53,701 kWh	\$7,257	183
Water Delivery Facilities ³⁴	253	10.1%	Electricity	537,034 kWh	\$60,154	1,833
Park Irrigation	4	0%	Electricity	8,925 kWh	\$1,313	30
Total Scope 2 Emissions	2,493		-	5,305,887 kWh	\$606,998	18,109
Total Emissions³⁵	2,496	100%	-	-	\$606,998	18,144

30 See LGOP inventory guidelines, page 12.

31 Due to Southern California Gas Company document retention policies official 1990 customer records are no longer available only casual records were located.

32 City owned streetlights and Southern California Edison owned streetlights have been combined in the total shown here.

33 City Parking Lot Lighting/Misc. and Decorative Lighting have been combined in the total shown here.

34 The Hydroelectric Station and pumping stations have been combined in the total shown here.

35 The summed totals shown here do not reflect the total emissions emitted in the year 1990 as not all of the data from that year was available.

B. Emissions Trends

Represented in Table 4 are the emissions trends from 1990 to 2005 (where reliable data existed) and emissions trends from 2005 to 2007 organized by source of emission.

Between a 15-year span from 1990 to 2005 electricity emissions have decreased by 27.7%. Improvements shown in buildings and facilities may be the result of energy efficiency technology upgrades. For natural gas, since only casual records were found for 1990 it was difficult to compare with 2005 where complete records could be found, therefore the percentage change was not listed.

Overall emissions from electricity use decreased 8.4% from 2005 to 2007. Emissions from natural gas use decreased by 7.1% (refer to appendix D, to review energy use per building). Fleet vehicle emissions from gasoline, diesel, and propane sources increased. Fuel sources related to employee commute vehicles decreased by 2.3% and 33.3% respectively. Emissions from waste increased 2.1% (refer to appendices C & D, for additional information).

Table 4. Emissions Trends 1990-2005 and 2005-2007

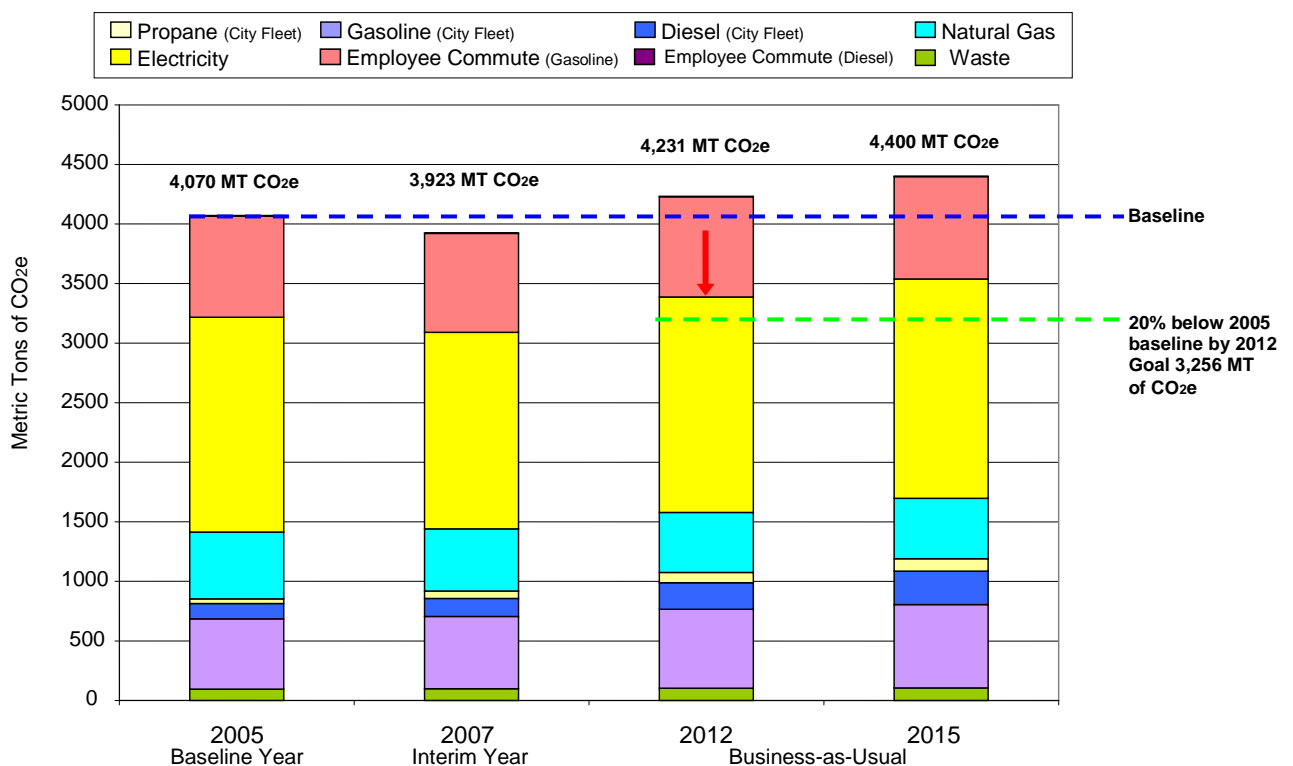
Electricity	MTCO ₂ e 1990	MT CO ₂ e 2005	Percentage Change	MT CO ₂ e 2005	MT CO ₂ e 2007	Percentage Change
Buildings & Facilities	1,097	827	-3.8%	827	776	-6.1%
Traffic Signals & Controllers	375	120	-68%	120	97	-19.1%
Streetlights	739	480	-35%	480	468	-2.5%
Park Lighting	-	110	-	110	108	-1.8%
Other Outdoor Lighting	-	68	-	68	24	-64.7%
Water Delivery Facilities	253	187	-26%	187	169	-9.6%
Sprinkler/Irrigation Control	25	7	-72%	7	4	-42.8%
Park Irrigation	4	3	-25%	3	4	+33.3%
Total	2,493	1,802	-27.7%	1,802	1,650	-8.4%
Natural Gas						
Buildings & Facilities	3	550	-	550	519	-5.6%
Water Delivery Facilities	.03	11	-	11	2	-81.8%
Total		561	-	561	521	-7.1%
Fuel						
Gasoline, City Vehicle Fleet	-	589	-	589	609	+3.3%
Diesel, City Vehicle Fleet	-	130	-	130	150	+15.3%
Propane, City Vehicle Fleet	-	39	-	39	63	+61.5%
Gasoline, Employee Commute		851	-	851	831	-2.3%
Diesel, Employee Commute	-	3	-	3	2	-33.3%
Waste						
Solid Waste	-	95	-	95	97	+2.1%

B. Forecasting and Setting GHG Emissions Reduction Targets

The business-as-usual forecast shown in Figure 7 is a prediction of the likely increase in GHG emissions from municipal operations and services. The emissions shown here represent the business-as-usual forecast for the years 2012 and 2015 if the City does nothing to decrease its GHG emissions. The City can expect GHG emissions levels to increase to 4,231 metric tons of CO₂e by 2012 and 4,400 metric tons of CO₂e by 2015. Several indicators are taken into consideration for predicting anticipated emissions growth, such as, energy usage trends between the baseline year and the interim year (where possible historical year data is taken into account), assumptions about future energy consumption based on the expansion of municipal facilities and operations, new programs that may increase the use of energy, and any anticipated increase in municipal staff. By developing a business-as-usual forecast of emissions, the City can identify a target year to reduce emissions and develop the appropriate measures and policies to target specific areas.

Before deciding on an emissions target it may be helpful to look at individual measures that are planned for implementation and quantify those measures in order to see how much of a reduction can be expected from a given measure. Figure 7 illustrates a possible reduction scenario if the City were to set a reduction goal of 20% below the 2005 baseline levels by 2012. ICLEI recommends setting a long-term target (15-20 years) from the baseline year and a short-term or interim target every 2-3 years to help ensure the City continues to reduce its emissions. The further away the goal, the larger amount of reductions should be targeted. The blue line represents the baseline year 2005 calculations from which a reduction target can be determined. The green line represents a possible reduction scenario. If the City were to set an emission target 20% below 2005 levels the goal would be to reduce emissions to 3,256 metric tons of CO₂e.

Figure 7. Business-as-Usual Forecast³⁶



³⁶ The Business-as-Usual (BAU) forecast includes emissions from scopes 1, 2, and 3. A compound annual growth rate formula and the weighted averages between data sets were used to forecast municipal operation growth. Emission factors from 2007 were used to determine the equivalent CO₂e emissions. The metric tons of CO₂e totals listed here are summed totals of the estimated emissions of each gas based on their global warming potential.

IV. Summary of Measures and Policies

There are a variety of ways in which the City of El Segundo is moving towards becoming a more sustainable city. Policies, measures and plans the City is currently working on will help the City reach its adopted emissions reduction goals. Below is a summary of historic and current measures organized into categories to help with the planning of the climate action document.

A. Energy Efficiency

Energy Efficiency Project: In 1998, the City and Siemens entered into an innovative energy services performance contract to retrofit the City's facilities with energy efficient fixtures and systems. Over the first eight year's term of the agreement, the City reduced its energy consumption by over 20%; amounting to a savings of \$2 million, energy savings of 10,558,433 kWh.

LED Holiday Lights: The City of El Segundo demonstrated energy efficiency by lighting up its historic water tower with strings of blue LED holiday lights.

Traffic Signal Retrofit: In 2007/2008 the City had a traffic signal retrofit and upgraded to LED lights.

Athletic Field Lighting Project: Current plans to replace athletic field lighting with state-of-the-art high efficiency lighting systems (latest generation T8, replacing incandescent; halogen).

Building Upgrades: In 2008, a new "Cool Roof" was installed on top of City Hall which reflects light and heat rather than absorbing it.

Compressed Workweek Schedule: City hall is closed on alternative Friday's to contribute to energy conservation and cost savings at facilities.

B. Solid Waste and Recycling

Recycling Program: Residents can drop off fluorescent light bulbs and batteries at City Hall to be recycled.

Public Beverage Container Recycling Bins: Placed at most City parks and many transit stops—separate beverage recycling collection containers along with trash cans.

Reuse It Program: The ReUselt Network is an on-line forum that serves as a tool to make connections between community members who want to help each other, themselves, and their environment. The program is entirely Web-based – it's a free service based on a Yahoo group.

No Drugs Down the Drain: In October 2008, the City hosted its first annual No Drugs down the Drain event where residents could disposed of their unused and expired non-controlled substances.

Backyard Composting: The City holds two compost and water-wise gardening workshops a year. In 2009, the City implemented a recycling and composting program at Center Street Elementary School.

C. Sustainable Development

Environmental Committee: El Segundo developed an Environmental Committee to establish and review the City's current environmental practices, identify new environmental goals and objectives, and develop a framework for protecting the City's quality of life. To address these goals and objectives the committee has created an environmental work plan that will guide the City towards sustainability.

D. Urban Forests

Trees to the Sea Project: To beautify Imperial Highway and put trees to work to change the course of global warming.

Arbor Day Event: March 7, 2009 to plant trees to beautify Hughes Way and put more trees to work to change the course of global warming.

E. Water Usage and Conservation

Water Conservation Ordinance: In the 1990's, the City adopted a Water Conservation Ordinance. The ordinance places restrictions, such as limited watering hours, on residents and businesses, as well as additional restrictions for different drought response levels. It also requires the retrofit of old fixtures, such as toilets and showerheads, with new water efficient models when a property is sold or undergoes significant improvements.

Building and Landscaping Upgrades: Water saving toilets and urinals were installed in City Hall and the Community Center gymnasium. A smart irrigation controller was installed at City Hall to allow the City to be more precise with the watering schedule and many of the City's newly re-landscaped areas, such as the Rossick Plaza Project, utilize drought tolerant plants to save water.

Recycled Water: The City of El Segundo made a commitment to purchase recycled water from West Basin Municipal Water District recycling facility in El Segundo for irrigation and other non-potable needs. Today over 50% of the water used by the City of El Segundo is recycled, and we effectively saved over 22,000,000 kWh of electricity over the period July 1 2007 through June 30, 2008. In 2009, the City of El Segundo was recognized by the State of California, Flex Your Power with an honorable mention for recycling 50% of its water.

F. Storm Water Management

National Pollutant Discharge Elimination System (NPDES): The City actively participates in the National Pollutant Discharge Elimination System (NPDES) requirements. In addition, the Planning Department has been working with developers on reducing impervious surface area on construction projects throughout the City.

G. Vehicle Fleet

Fuel-Efficient Vehicles: El Segundo has a five hybrid vehicles; two electric vehicles; one natural gas vehicle and five propane vehicles.

H. Community Involvement

Outreach: The City actively participates in promoting water conservation programs offered by West Basin and Metropolitan Water District of Southern California, including high efficiency toilet exchanges, free landscape audits and irrigation controllers, and free water brooms. The City also partners with Northrop Grumman and Whole Foods Market, Plaza El Segundo to hold annual E-Waste events.

I. Education and Outreach

Education and Outreach: July 3rd 2008 - The City hosted the first annual “Environmental Expo” which featured a Christmas in July promotion allowing citizens to trade in old Christmas lights for LED energy efficient ones, recycled bags, and waste information and education.

City staff has attended and assisted in the coordination of various green workshops to better understand the different approaches to green building. The Environmental Committee working with the South Bay Environmental services Center will develop and hold green building workshops for El Segundo residents and business in the fall of 2009 early spring 2010. Furthermore, we have two staff members that are actively involved in the South Bay Green Task Force.

The City works closely with the South Bay Environmental Services Center to increase the City's energy efficiency by promoting educational outreach and introducing energy efficient technologies for businesses and residents.

In 2009, the City was awarded a \$58,000 grant from Metropolitan Water District and West Basin Municipal Water District for the “It's Time to Get Serious” Water Conservation Banner campaign. The campaign focuses on indoor/outdoor water conservation through creative signage (banners). For a period of six months, 110 banners will be displayed along Sepulveda Blvd to reinforce simple behaviors that residents and business owners in El Segundo can adopt to reduce the amount of water they use.

Appendix A—Greenhouse Gas Municipal Inventory Details

A. Greenhouse Gas Report 2005—Baseline Year

The year 2005 represents the baseline year for the GHG inventory and will be used to set an emissions reduction target and track progress of emissions goals. Below are the GHG inventory details. This level of reporting is referred to as a quick action report wherein three of the six internationally-recognized GHGs regulated under the Kyoto Protocol (carbon dioxide, methane, and nitrous oxide) are reported separately in metric tons and aggregated with other gases not listed here to show the CO₂e summed totals of the estimated emissions of gases with different global warming potentials (see appendix E of LGOP). The control approach was utilized to define the City's scopes of emissions.

Reporting year: 2005

Protocol Used Local: Government Operation Protocol, version 1.0

Control Approach: Operational Control

GHG Emissions Summary (All Units in Metric Tons)

Buildings & Other Facilities					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	550	548	0.05170	0.00103
Scope 2	Purchased Electricity	827	822	0.03581	0.01358

Streetlights and Traffic Signals					
Scope 2		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Purchased Electricity	778	772	0.03364	0.01276

Water Delivery					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	11	10	0.00102	0.00002
Scope 2	Purchased Electricity	197	196	0.00854	0.00324

Vehicle Fleet					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Mobile Combustion	758	742	0.03757	0.04991

Solid Waste					
Scope 3		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Contract Services				
	Consolidated Disposal Service	95	95	4.52875	--

Employee Commute					
Scope 3		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Employee Commute	854	834	0.05109	0.06017

Total Emissions					
		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Scope 1	1319	1300	0.09030	0.05097
	Scope 2	1802	1876	0.07799	0.02958
	Scope 3	949	929	4.5798	0.06017

B. Greenhouse Gas Report 2007— Interim Year

The year 2007 represents data collected from an interim year to review any changes in GHG emissions that may have occurred since the baseline year. The recommended operational control approach was used to define the City’s boundaries. Below are the GHG inventory details. This level of reporting is referred to as a quick action report wherein three of the six internationally-recognized GHGs regulated under the Kyoto Protocol (carbon dioxide, methane, and nitrous oxide) are reported separately in metric tons and aggregated with other gases not listed here to show the CO₂e summed totals of the estimated emissions of gases with different global warming potentials (see appendix E of LGOP). The control approach was utilized to define the City’s scopes of emissions.

Reporting year: 2007

Protocol Used Local: Government Operation Protocol, version 1.0

Control Approach: Operational Control

GHG Emissions Summary (All Units in Metric Tons)

Buildings & Other Facilities					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	519	517	0.04875	0.00097
Scope 2	Purchased Electricity	776	771	0.03488	0.01323

Streetlights and Traffic Signals					
Scope 2		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Purchased Electricity	697	692	0.03131	0.01187

Water Delivery					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	2	2	0.00018	0.000003
Scope 2	Purchased Electricity	177	175	0.00793	0.00300

Vehicle Fleet					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Mobile Combustion	822	805	0.03849	0.05055

Solid Waste					
Scope 3		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Contract Services				
	Consolidated Disposal Service	97	97	4.613295	--

Employee Commute					
Scope 3		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Employee Commute	833	816	0.04727	0.05184

Total Emissions					
		CO ₂ e	CO ₂	CH ₄	N ₂ O
Scope 1		1343	1324	0.08742	0.05153
Scope 2		1650	1639	0.07412	0.02811
Scope 3		930	913	4.6606	0.05184

C. Greenhouse Gas Report 1990—Historical Year

The year 1990 represents a reference year for several key pieces of climate change legislation such as the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol agreement, and the U.S. Mayors' Climate Protection Agreement. Where available and reliable information could be found historical GHG emissions have been recorded below. Carbon dioxide, methane, and nitrous oxide are reported separately in metric tons and aggregated with other gases not listed here to show the CO₂e summed totals of the estimated emissions of gases with different global warming potentials (see appendix E of LGOP). The control approach was utilized to define the City's scopes of emissions.

Reporting year: 1990

Protocol Used Local: Government Operation Protocol, version 1.0

Control Approach: Operational Control

GHG Emissions Summary (All Units in Metric Tons)

Buildings & Other Facilities					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	3	3	0.00028	0.000005
Scope 2	Purchased Electricity	1097	1091	0.04235	0.01482

Streetlights and Traffic Signals					
Scope 2		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Purchased Electricity	1114	1109	0.04303	0.01506

Water Delivery					
Scope 1		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Stationary Combustion	0.03	0.03183	0.000003	0.00000006
Scope 2	Purchased Electricity	282	280	0.01088	0.00380

Total Emissions					
		CO ₂ e	CO ₂	CH ₄	N ₂ O
	Scope 1	3.03	3.03	0.00028	0.000005
	Scope 2	2494	2482	0.096270	0.03369
	Scope 3	-	-	-	-

Appendix B—Activity Data Disclosure

Listed below are the data sources. Activity data refers to consumption data such as fuel or electricity used which results in GHG emissions. In an effort to establish good reporting habits, improve the quality of future inventories, and to comply with the overarching reporting principles mentioned in the LGOP - relevance, completeness, consistency, transparency, and accuracy - this information has been recorded. This information is grouped by scope and source of emission. Descriptions of data sources and the methodology used to obtain information are listed here. Indicated in the upper right-hand corner is the methodology used and whether or not it is a recommended or alternative method as prescribed by the LGOP. In this way, the City will be able to improve its data collection process if an alternative method is listed. It is important to note that scope 3 emissions are considered optional reporting.

A. Buildings & Other Facilities

Scope 1 Stationary Combustion

<p>Description: Consumption data was obtained from Southern California Gas Company.</p> <p>Southern California Gas no longer possesses official customer records going back to 1990 due to document retention policies. SoCalGas located some casual records that go back to 1990 which was the basis for the gas information provided for 1990.</p>	<p>Recommended Method Known Natural Gas use</p>
<p>Reference: Chauncy Tou, Energy Programs Advisor Customer Programs, Southern California Gas Company, 213-244-2833, ctou@semprautilities.com</p>	

Scope 2 Purchased Electricity

<p>Description: Consumption data was obtained from Southern California Edison.</p>	<p>Recommended Method Known electricity use</p>
<p>Reference: Larry Sutton, Account Executive, Southern California Edison, 714-973-5660 PAX 52660 Maya R. Aubrey, Analyst-Program/Project, Southern California Edison, (909) 357-6536 PAX 16036, Maya.Aubrey@sce.com</p>	

B. Street Lighting and Traffic Signals

Scope 2 Purchased Electricity

<p>Description: Consumption data was obtained from Southern California Edison.</p> <p>Note: Accounts owned by SCE were included but recorded separately.</p>	<p>Recommended Method Known electricity use</p>
<p>Reference: Larry Sutton, Account Executive, Southern California Edison, 714-973-5660 PAX 52660 Maya R. Aubrey, Analyst-Program/Project, Southern California Edison, (909) 357-6536 PAX 16036, Maya.Aubrey@sce.com</p>	

C. Water Delivery

Scope 2 Purchased Electricity

<p>Description: Consumption data was obtained from Southern California Edison.</p>	<p>Recommended Method Known electricity use</p>
<p>Reference: Larry Sutton, Account Executive, Southern California Edison, 714-973-5660 PAX 52660 Maya R. Aubrey, Analyst-Program/Project, Southern California Edison, (909) 357-6536 PAX 16036, Maya.Aubrey@sce.com</p>	

D. Vehicle Fleet

Scope 1 Mobile Combustion

<p>Description: City staff provided cost and quantity of fuel based on fuel tracking system information.</p>	<p>Recommend Method Fuel tracking system records</p>
<p>Reference: Data was provided by Lauren Mahakian, Senior Administrative Analyst, 310-524-2359</p>	

Scope 3 Employee Commute

<p>Description: Employee commute results were determined by conducting a survey of employee commute distance, mode and frequency for the years 2007 and 2005. The online website Survey Monkey was utilized to conduct the survey www.surveymonkey.com</p>
<p>Reference: Data was provided by Lauren Mahakian, Senior Administrative Analyst, 310-524-2359</p>

E. Solid Waste Facilities

Scope 3 Waste Related

<p>Description: Refuse estimates were based on City waste information provided by Public Works, Facilities Division. No records could be found for 1990 City operated and owned facilities. Solid Waste Characterization was obtain from the California Integrated Waste Management Board http://www.ciwmb.ca.gov/wastechar/BizGrpCp.asp</p>
<p>Reference: Lauren Mahakian, Senior Administrative Analyst, 310-524-2359</p>

Appendix C—Methodology/Emissions Factors Disclosure

It is considered good practice to disclose all methodologies employed to calculate emissions. Listed below are the formulas used to determine the equivalent emissions. Emissions factors refer to a unique value used to determine the amount of a GHG emitted on a per unit activity basis. They are used to convert activity data, like energy usage, into the associated GHG emissions.³⁷ In compliance with the LGOP and ICLEI program reporting requirements listed below and organized by scope are descriptions of computational methods and emission factors used to arrive at the equivalent GHG emissions. Indicated in the top right corner is the method used and whether it is considered to be a recommended or alternate method based on the LGOP standards. In this way, the City will be able to improve its data collection where an alternative method is listed. It is important to note that scope 3 emissions are considered optional reporting.

A. Scope 1 Stationary Combustion

<p>Description of Computational Method: Table G.1 of the LGOP, Default factors for CO2 emissions, pg. 170 and Table G.3 of the LGOP, Default CH4 and N2O emissions factors by fuel type and sector, pg. 172.</p>	<p>Recommended Method Default emission factors, Table G.1 and Table G.3 of the LGOP</p>
<p>Criteria Air Pollutants, Table 3. NERC Western Systems Coordinating Council/CNV 1990- 2005 2007 inventory-2005 CAP emissions factors 2005 inventory-2005 CAP emissions factors 1990 inventory-1990-2003 emissions factors</p>	
<p>Reference: Data was provided by Chauncy Tou, Energy Programs Advisor Customer Programs, Southern California Gas Company, 213-244-2833, ctou@semprautilities.com</p>	

B. Scope 1 Mobile Combustion

<p>Description of Computational Method: City fleet fuel consumption and cost were obtained from fuel tracking system records.</p>	<p>Alternative Method Alternative emissions factors, Table G.13 of the LGOP</p>
<p>Alternate Emissions Factors were used based on Table G.13 of the LGOP, Alternate Methodology for Highway Vehicles by Inventory Year, pg. 180.</p>	
<p>Reference: Data was provided by Lauren Mahakian, Senior Administrative Analyst, 310-524-2359</p>	

C. Scope 2 Purchased Electricity

<p>Description of Computational Method: Table G.5 Utility-Specific Verified Electricity CO2 Emissions Factors (2000-2006), LGOP pg. 174.</p>	<p>Recommended Method Utility-Specific verified emission factors used</p>
<p>For 2005 inventory Southern California Edison, 2005 emission factors were used; For 2007, inventory Southern California Edison, 2006 emissions factors were used.</p>	
<p>Table G.6 California Grid Average Electricity Emissions Factors (1990-2004) emissions factors from the year 2004 was used for both 2005 and 2007.</p>	
<p>The year 1990 emissions factors from Table G.6 were used for the 1990 inventory.</p>	

³⁷ A full description of emissions factor can be found on page 27 of the Local Government Operations Protocol. Emission factors are determined by means of direct measurement, laboratory analyses or calculations based on representative heat content and carbon content.

Reference: Data was provided by Larry Sutton, Account Executive, Southern California Edison, 714-973-5660 PAX 52660 Maya R. Aubrey, Analyst-Program/Project, Southern California Edison, (909) 357-6536 PAX 16036, Maya.Aubrey@sce.com

D. Scope 3 Waste Related Emissions

Description of Computational Method:
 Refuse estimates were based on City waste information provided by Public Works, Facilities Division. For both years, waste estimates were based on the volume and frequency of waste collected from city building/facility bins. It was assumed containers were 100% full at time of pick-up. For 2007, municipal employee growth rates were utilized to estimate changes in waste generated from city operated buildings.

A 75% methane recovery default was used for CACP software.

2007 Tons estimated = 382
 2005 Tons estimated = 375
 For 2007, employee growth rates were used to estimate the tons of waste. No records could be found for 1990 City operated and owned facilities.

Solid Waste Characterization for public administration was obtain from the California Integrated Waste Management Board <http://www.ciwmb.ca.gov/wastechar/BizGrpCp.asp>

Reference: Lauren Mahakian, Senior Administrative Analyst, 310-524-2359

E. Scope 3 Employee Commute

<p>Description of Computational Method:</p> <p>The online website Survey Monkey was utilized to conduct an employee commute the survey http://www.surveymonkey.com</p>	<p>Alternative Method Alternative emissions factors, Table G.13, LGOP</p>
<p>Utilizing employee benefits information, it was estimated that on average employees worked 46.5 weeks, which means 28 days were deducted from the 260 possible working days in a year. It was assumed that these absences were due to vacation, sick, personal, and holiday.</p> <p>Respondents who drove city vehicles, or were not employed by the City in the years surveyed, walked, bicycled, or used another form of transportation were excluded from the emissions inventory.</p> <p>VMT calculations for public transit were based on information from Scott Greene of LA County Metropolitan Transportation Authority (Metro). In 2005 and 2007 the standard transit bus had 40 seats per bus. The standard for the Green Line is 76 seats per rail car.</p> <p>Alternate Emissions Factors were used based on Table G.13 of the LGOP, Alternate Methodology for Highway Vehicles by Inventory Year, pg. 180.</p> <p>2007--359 employees with 165 responses is a 46% response rate. The remaining 54% of VMT was estimated based on survey responses for a total VMT of 1,652,093. Assumptions: gasoline, drove alone, passenger vehicle (2.1 x 786,711=1,652,093 Total VMT)</p> <p>2005--352 employees with 158 responses is a 45% response rate. The remaining 55% of VMT was estimated based on survey responses for a total VMT of 1,653,428. Assumptions: gasoline, drove alone, passenger vehicle (2.2 x 751,558=1,653,428 Total VMT)</p>	
<p>Reference: Lauren Mahakian, Senior Administrative Analyst, 310-524-2359</p>	

Appendix D—Emissions Data

The municipal inventory report was based on data collected from electricity, natural gas consumption, fuels, and other sources listed in the tables below as reference. Information is organized to be consistent with the order of the report, e.g., baseline year, interim year, and historical year. Emissions sources are organized according to source, equivalent metric tons of carbon dioxide emissions, energy equivalent in MMBtu, energy/fuel use, and cost where known.³⁸

Sources of Emissions 2005	Source	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (MMBtu)	Energy/Fuel Use	Cost (\$)
Buildings and Facilities						
City Hall	Electricity	459	11.3	5155	1,510,322kWh	\$ 157,616
Police Department	Natural Gas	168	4.1	3162	31,615 therms	\$ 31,540
Fire Station 1	Natural Gas	10	0.2	185	1,848 therms	\$ 2,251
Fire Station 2	Electricity	19	0.5	214	62,680 kWh	\$ 8,760
	Natural Gas	6	0.1	114	1,139 therms	\$ 1,472
Library:						
Main Library	Electricity	135	3.3	1519	445,060 kWh	\$ 55,994
	Natural Gas	36	0.9	668	6,675 therms	\$ 6,926
Library Annex	Electricity	20	0.5	227	62,680 kWh	\$ 9,153
Parks & Recreations:						
Teen Center	Electricity	10	0.2	111	32,634 kWh	\$ 4,616
	Natural Gas	6	0.1	109	1,086 therms	\$ 1,307
Clubhouse	Electricity	17	0.4	187	54,920 kWh	\$ 12,842
	Natural Gas	1	0	25	250 therms	\$ 424
Recreation Park, Joslyn	Electricity	44	1.1	496	145,440 kWh	\$ 8,359
	Natural Gas	6	0.2	119	1,189 therms	\$ 1,500
Check Out Building	Natural Gas	2	0	32	324 therms	\$ 480
Hilltop Park	Natural Gas	5	0.1	95	948 therms	\$ 1,076
Acacia Park	Natural Gas	11	0.3	210	2,097 therms	\$ 2,119
Hardball Concession Stand	Natural Gas	0	0	9	86 therms	\$ 216
Softball Concession Stand	Natural Gas	0	0	4	42 therms	\$ 167
Camp Eucalyptus	Electricity	1	0	8	2,240 kWh	\$ 439
Urho Saari Swim Stadium (The Plunge)	Natural Gas	253	6.2	4761	47,606 therms	\$ 46,317
Public Works:						
Public Works Yard	Electricity	56	1.4	627	183,720 kWh	\$ 21,948

³⁸ Source of data CACP software output.

	Natural Gas	21	0.5	389	3,892 therms	\$ 4,156
Demo House Sound Proofing	Electricity	0	0	3	894 kWh	\$ 116

The Lakes Golf Course:

Golf Driving Range	Electricity	40	1	453	132,696 kWh	\$ 16,925
Pro Shop at Golf Course	Electricity	6	0.2	72	21,078 kWh	\$ 3,109
Golf Course Main Building	Electricity	2	0	23	6,597kWh	\$ 1,091
	Natural Gas	23	0.6	437	4,374 therms	\$ 4,204

Water Department:

Water Yard	Electricity	17	0.4	187	54,800 kWh	\$ 8,856
	Natural Gas	1	0	24	243 therms	\$ 398

Metering Stations:

Imperial Metering Station	Electricity	0	0	2	483 kWh	\$ 373
Sandhill Metering Station	Electricity	1	0	8	2,254 kWh	\$ 480

Streetlights & Traffic Signals

Traffic Signals/Controllers	Electricity	120	2.9	1346	394,419 kWh	\$ 46,931
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Streetlights:

Streetlight	Electricity	76	1.9	853	249,892 kWh	\$ 19,546
Streetlight SCE Owned	Electricity	404	9.9	4534	1,328,363 kWh	\$ 207,049

Park Lighting:

Park Lighting	Electricity	110	2.7	1231	360,789 kWh	\$ 20,680
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Other Outdoor Lighting:

Tree Wells-Up Lighting	Electricity	5	0.1	52	15,098 kWh	\$ 3,156
Field Lighting	Electricity	63	1.6	711	208,320 kWh	\$ 12,182
City Parking Lot Lighting/Misc.	Electricity	0	0	0	0 kWh	\$ 354
Decorative Lighting	Electricity	0	0	2	631 kWh	\$ 420

Water Delivery

Pumping Stations	Electricity	187	4.6	2098	614,789 kWh	\$ 78,419
	Natural Gas	11	0.3	204	2,043 therms	\$ 2,658
Hydroelectric Station	Electricity	0	0	0	207 kWh	\$ 207
Sprinkler/Irrigation Control	Electricity	7	0.2	78	22,925 kWh	\$ 5,699
Park Irrigation	Electricity	3	0.1	39	11,474 kWh	\$ 2,774

Vehicle Fleet

Dept. 2402 Planning/Bldg Safety	Gasoline	0	0	5	43 gal	\$ 89
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Dept. 2403 Bldg Safety	Gasoline	17	0.5	231	1,862 gal	\$ 4,100
Dept. 2501 Finance Admin	Gasoline	0	0	2	16 gal	\$ 30
Dept. 2601 PW Gov Bldgs	Gasoline	8	0.2	107	865 gal	\$ 1,901
2901 Non departmental	Gasoline	0	0	7	53 gal	\$ 113
Dept. 3101 Police Admin	Gasoline	312	7.5	4298	34,597 gal	\$ 74,275
Dept. 3105 Police Community Relations	Gasoline	12	0.3	163	1,316 gal	\$ 2,727
Dept. 3202 Fire Suppression	Diesel	93	2.2	1269	9,148	\$ 19,315
	Gasoline	29	0.7	403	3,244 gal	\$ 7,197
Dept. 4101 PW Engineering	Gasoline	1	0	17	139 gal	\$ 308
Dept. 4202 PW Street Maintenance	Diesel	13	0.3	176	1268 gal	\$ 2,669
	Gasoline	28	0.7	383	3,084 gal	\$ 6,631
	Propane (LPG)	0	0	3	31 gal	\$ 55
	Diesel (OFF ROAD)	0	0	3	19 gal	\$ 35
Dept. 4205 PW Traffic Safety	Gasoline	11	0.3	147	1180 gal	\$ 2,602
	Propane (LPG)	5	0.1	78	853 gal	\$ 1,406
	Diesel (OFF ROAD)	1	0	8	55 gal	\$ 112
	Gasoline (OFF ROAD)	0	0	4	29 gal	\$ 66
Dept. 4301 PW Wastewater	Diesel	10	0.2	142	1027 gal	\$ 2,223
	Gasoline	19	0.5	260	2,097 gal	\$ 4,715
	Diesel (OFF ROAD)	0	0	0	2 gal	\$ 6
Dept. 4601 PW Equipment Main	Gasoline	11	0.3	155	1,247 gal	\$ 2,831
Dept. 5102 Parks operations	Diesel	6	0.2	86	620 gal	\$ 1,301
	Gasoline	42	1	581	4,673 gal	\$ 10,270
	Propane (LPG)	5	0.1	79	859 gal	\$ 1,428
	Diesel (OFF ROAD)	3	0.1	44	315 gal	\$ 673
Dept. 5201 Parks operations	Gasoline	1	0	12	100 gal	\$ 200
Dept. 5292 Recreation Prop A "Dial A Ride"	Gasoline	62	1.5	851	6,851 gal	\$ 15,297
	Propane (LPG)	29	0.7	430	4,698 gal	\$ 7,434
Dept. 6601 Community Cable Div	Gasoline	0	0	6	51 gal	\$ 100
Dept. 7102 Water Div	Diesel	2	0	22	160 gal	\$ 344
	Gasoline	36	0.9	495	3986 gal	\$ 8,832
	Propane (LPG)	0	0	1	11 gal	\$ 16
	Diesel (OFF ROAD)	1	0	8	60 gal	\$ 127

Employee Commute

Drove Alone	Diesel	3	0.1	45	6,045 VMT	n/a
	Gasoline	829	20.4	11,422	1,600,616 VMT	n/a
	Gasoline(OFF ROAD)	9	0.2	129	22,948 VMT	n/a
Carpool	Gasoline	13	0.3	176	23,598 VMT	n/a
Public Transportation	Diesel	0	0	4	161 VMT	n/a
	Electricity	0	0	0	60 VMT	n/a

Waste						
Consolidated Disposal Service, LLC/Allied Waste, LLC	Carbon Dioxide	95				n/a
Sources:	Food Waste	10				n/a
	Paper Products	72				n/a
	Plant Debris	10				n/a
	Wood/Textiles	3				n/a

Sources of Emissions 2007	Source	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (MMBtu)	Energy/ Fuel Use	Cost (\$)
Buildings and Facilities						
City Hall	Electricity	414	10.5	4823	1,413,034 kWh	\$ 176,837
Police Department	Natural Gas	128	3.3	2404	24,037 therms	\$ 21,879
Fire Station 1	Natural Gas	10	0.3	196	1,955 therms	\$ 2,255
Fire Station 2	Electricity	19	0.5	219	64,200 kWh	\$ 9,128
	Natural Gas	7	0.2	129	1,288 therms	\$ 1,582
Library:						
Main Library	Electricity	122	3.1	1422	416,554 kWh	\$ 54,145
	Natural Gas	35	0.9	663	6,627 therms	\$ 6,404
Library Annex	Electricity	20	0.5	238	69,720 kWh	\$ 9,650
Parks & Receptions:						
Teen Center	Electricity	11	0.3	127	37,069 kWh	\$ 5,965
	Natural Gas	16	0.4	295	2,947 therms	\$ 3,103
Clubhouse	Electricity	28	0.8	325	95,310 kWh	\$ 14,367
	Natural Gas	2	0	33	334 therms	\$ 492
Recreation Park, Joslyn	Electricity	41	1.0	476	139,360 kWh	\$ 18,264
	Natural Gas	10	0.3	197	1,966 therms	\$ 2,224
Check Out Building	Natural Gas	2	0	36	362 therms	\$ 531
Hilltop Park	Natural Gas	6	0.1	104	1,038 therms	\$ 1,114
Acacia Park	Natural Gas	10	0.3	185	1,854 therms	\$ 1,853

Hardball Concession Stand	Natural Gas	0	0	8	84 therms	\$ 230
Softball Concession Stand	Natural Gas	0	0	5	47 therms	\$ 178
Camp Eucalyptus	Electricity	1	0	7	1,960 kWh	\$ 490
Urho Saari Swim Stadium (The Plunge)	Natural Gas	261	6.7	4916	49,155 therms	\$ 43,037
Public Works:						
Public Works Yard	Electricity	52	1.3	607	177,780 kWh	\$ 21,926
	Natural Gas	25	0.6	479	4,787 therms	\$ 4,792
The Lakes Golf Course:						
Golf Driving Range	Electricity	44	1.1	513	150,210 kWh	\$ 19,682
Pro Shop at Golf Course	Electricity	7	0.2	81	23,738 kWh	\$ 3,929
Golf Course Main Building	Electricity	2	0.1	26	7,542 kWh	\$ 1,405
	Natural Gas	4	0.1	83	827 therms	\$ 1,016
Water Department:						
Water Yard	Electricity	15	0.4	180	52,800 kWh	\$ 7,439
	Natural Gas	1	0	21	205 therms	\$ 350
Metering Stations:						
Imperial Metering Station	Electricity	0	0	2	525 kWh	\$ 269
Sandhill Metering Station	Electricity	1	0	7	2,171 kWh	\$ 525
Streetlights & Traffic Signals						
Traffic Signals/Controllers	Electricity	97	2.5	1133	331,898 kWh	\$ 44,525
Streetlights:						
Streetlight	Electricity	69	1.7	799	234,252 kWh	\$ 22,711
Streetlight SCE Owned	Electricity	399	10.2	4658	1,364,704 kWh	\$ 259,443
Park Lighting:						
Park Lighting	Electricity	108	2.8	1259	368,915 kWh	\$ 82,058
Other Outdoor Lighting:						
Tree Wells-Up Lighting	Electricity	2	0.0	21	6,118 kWh	\$ 2,074
Field Lighting	Electricity	22	0.5	251	73,522 kWh	\$ 18,571
City Parking Lot Lighting/Misc.	Electricity	0	0.0	1	205 kWh	\$ 405
Decorative Lighting	Electricity	0	0.0	2	720 kWh	\$ 486
Water Delivery Facilities						
Pumping Stations	Electricity	169	4.3	1970	577,235 kWh	\$ 86,166
	Natural Gas	2	0.0	36	362 therms	\$ 1,079
Hydroelectric Station	Electricity	0	0.0	2	720 kWh	\$ 343

Sprinkler/Irrigation Control	Electricity	4	0.1	44	12971 kWh	\$	4,638
Park Irrigation	Electricity	4	0.1	41	12,147 kWh	\$	3,024
Vehicle Fleet							
Dept. 2402 Planning/Bldg Safety	Gasoline	2	0.1	28	222 gal	\$	576
Dept. 2403 Bldg Safety	Gasoline	13	0.3	181	1455 gal	\$	3,695
Dept. 2501 Finance Admin	Gasoline	0	0	5	40 gal	\$	104
Dept. 2601 PW Gov Bldgs	Gasoline	8	0.2	111	896 gal	\$	2,307
2901 Non departmental	Gasoline	1	0	20	160 gal	\$	396
Dept. 3101 Police Admin	Gasoline	337	8.6	4656	37,481 gal	\$	98,663
Dept. 3105 Police Community Relations	Gasoline	4	0.1	50	403 gal	\$	1,026
Dept. 3202 Fire Suppression	Diesel	100	2.5	1371	9,889 gal	\$	24,581
	Gasoline	39	1	535	4,307 gal	\$	11,123
Dept. 4101 PW Engineering	Gasoline	2	0	22	176 gal	\$	442
Dept. 4202 PW Street Maintenance	Diesel	16	0.4	214	1,541 gal	\$	3,747
	Gasoline	28	0.7	380	3,061 gal	\$	7,867
	Propane (LPG)	1	0	8	90 gal	\$	180
	Diesel (OFF ROAD)	2	0	22	160 gal	\$	403
	Gasoline (OFF ROAD)	0	0	0	.5 gal	\$	1
Dept. 4205 PW Traffic Safety	Gasoline	10	0.3	144	1,160 gal	\$	3,062
	Propane (LPG)	6	0.2	92	1,009 gal	\$	1,953
	Diesel(OFF ROAD)	0	0	5	36 gal	\$	88
	Gasoline (OFF ROAD)	0	0	2	17 gal	\$	43
Dept. 4301 PW Wastewater	Diesel	23	0.6	320	2306 gal	\$	5,672
	Gasoline	23	0.6	313	2,523 gal	\$	6,394
	Diesel (OFF ROAD)				None		None
Dept. 4601 PW Equipment Main	Gasoline	8	0.2	111	892 gal	\$	2,336
Dept. 5102 Parks operations	Diesel	4	0.1	56	406 gal	\$	971
	Gasoline	45	1.1	614	4,947 gal	\$	12,777
	Propane (LPG)	6	0.2	90	983 gal	\$	1,854
	Diesel (OFF ROAD)	2	0.1	34	242 gal	\$	596
Dept. 5201 Parks operations	Gasoline	1	0	8	68 gal	\$	173
Dept. 5292 Recreation Prop A "Dial A Ride"	Gasoline	48	1.2	661	5,320 gal	\$	13,505
	Propane (LPG)	50	1.3	754	8,226 gal	\$	15,889
Dept. 6601 Community Cable Div	Gasoline	0	0	2	20 gal	\$	52

Dept. 7102 Water Div	Diesel	2	0	25	179 gal	\$ 450
	Gasoline	40	1	556	4472 gal	\$ 11,342
	Diesel (OFF ROAD)	1	0	9	66 gal	\$ 163

Employee Commute

Drove Alone	Diesel	2	0.1	31	4185 VMT	n/a
	Gasoline	800	20.3	11,050	1,582,729 VMT	n/a
	Gasoline	9	0.2	129	22,948 VMT	n/a
Carpool	Gasoline	22	0.6	302	41,976 VMT	n/a
Public Transportation	Diesel	0	0	4	198 VMT	n/a
	Electricity	0	0	1	60 VMT	n/a

Waste

Consolidated Disposal Service, LLC/Allied Waste, LLC	Carbon Dioxide	97				n/a
Sources:	Food Waste	10				
	Paper Products	73				
	Plant Debris	10				
	Wood/Textiles	4				

Sources of Emissions 1990	Source	Equiv CO ₂ (tonnes)	Equiv CO ₂ (%)	Energy (MMBtu)	Energy/Fuel Use	Cost (\$)
Buildings and Facilities						
City Hall	Electricity	630	25.2	4578	13,41,240 kWh	\$ 122,107
Police Department	Natural Gas	1	0	15	146 therms	n/a
Fire Station 1	Natural Gas	0	0	3	26 therms	n/a
Fire Station 2	Electricity	18	0.7	131	38,320 kWh	\$ 4,627
	Natural Gas	0	0	1	13 therms	n/a
Library:						
Main Library	Electricity	31	1.3	229	66.980 kWh	\$ 6,004
	Natural Gas	0	0	4	42 therms	n/a
Library Annex	Electricity	20	0.8	144	42,060 kWh	\$ 5,032
Parks & Recreations:						
Teen Center	Electricity	12	0.5	84	24,640 kWh	\$ 3,262
	Natural Gas	0	0	0	3 therms	n/a

Clubhouse	Electricity	52	2.1	376	110,040 kWh	\$ 12,772
	Natural Gas	0	0	1	10 therms	n/a
Recreation Park, Joslyn	Electricity	244	9.8	1771	519,040 kWh	\$ 58,016
	Natural Gas	0	0	1	13 therms	n/a
Check Out Building	Natural Gas	0	0	2	21 therms	n/a
Hilltop Park	Natural Gas	0	0	2	15 therms	n/a
Acacia Park	Natural Gas	0	0	1	12 therms	n/a
Hardball Concession Stand	Natural Gas	0	0	0	1 therm	n/a
Softball Concession Stand	Natural Gas	0	0	0	1 therm	n/a
Urho Saari Swim Stadium (The Plunge)	Natural Gas	1	0.1	23	229 therms	n/a
Public Works:						
Public Works Yard	Electricity	62	2.5	450	131,820 kWh	\$ 13,322
	Natural Gas	0	0	3	31 therms	n/a
Water Department:						
Water Yard	Electricity	27	1.1	198	58,120 kWh	\$ 6,157
	Natural Gas	0	0	1	7 therms	n/a
Metering Stations:						
Imperial Metering Station	Electricity	0	0.0	1	433 kWh	\$ 209
Sandhill Metering Station	Electricity	1	0.0	6	1,862 kWh	\$ 317
Streetlights & Traffic Signals						
Traffic Signals/Controllers	Electricity	375	15.0	2725	798,548 kWh	\$ 80,553
Streetlights:						
Streetlight	Electricity	115	4.6	835	244,654 kWh	\$ 18,486
Streetlight SCE Owned	Electricity	624	25.0	4534	1,328,363 kWh	\$ 207,049
Other Outdoor Lighting:						
Misc. Outdoor Lighting	Electricity	0	0.0	1	107 kWh	\$ 360
Water Delivery Facilities						
Pumping Stations	Electricity	252	10.1	1826	535,114 kWh	\$ 59,509
	Natural Gas	0.03	0	1	6 therms	n/a
Hydroelectric Station	Electricity	1	0	7	1,920 kWh	\$ 645
Sprinkler/Irrigation Control	Electricity	25	1.0	183	53,701 kWh	\$ 7,257
Park Irrigation	Electricity	4	0.2	30	8,925 kWh	\$ 1,313

Criteria Air Pollutants³⁹

Municipal operations are also responsible for emitting criteria air pollutants which have been linked to various environmental and public health problems. The CACP software generates data on these emissions as shown in the tables below.⁴⁰ Actions taken to reduce emissions will also reduce criteria air pollutants as well.

Criteria Air Pollutants 2005	NOx (lbs)	SOx (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)
Building and Facilities	4,151	1,679	1,977	267	1,382
Vehicle Fleet	5,713	290	41,388	4,497	167
Employee Commute	5,324	301	57,900	5,949	123
Streetlights & Traffic Signals	2,267	1,513	1,436	161	1,248
Water Delivery	610	385	373	43	318
Total	18,066	4,168	103,073	10,918	3,238

Criteria Air Pollutants 2007	NOx (lbs)	SOx (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)
Building and Facilities	3,989	1,634	1,912	258	1,345
Vehicle Fleet	6,212	307	44,141	4,786	169
Employee Commute	5,021	289	57,622	5,812	120
Streetlights & Traffic Signals	2,110	1,408	1,336	150	1,162
Water Delivery	541	357	340	38	295
Total	17,873	3,995	105,351	11,045	3,090

Criteria Air Pollutants 1990	NOx (lbs)	SOx (lbs)	CO (lbs)	VOC (lbs)	PM10 (lbs)
Building and Facilities	2,012	1,624	1,293	147	1,223
Streetlights & Traffic Signals	2,034	1,649	1,311	149	1,243
Water Delivery	514	417	331	38	314
Total	4,561	3,690	2,935	334	2,780

³⁹ To review definitions and acronyms for criteria air pollutants refer to appendices sections G and H.

⁴⁰ Source of data CACP software output.

Indicator Inputs

Indicator inputs is a term used by ICLEI to describe statistics such as the number of employees that work in a building or how many streetlights are in the City. The CACP software is able to provide an additional analysis based on the statistics entered such as energy use per square foot. These statistics are not necessary to calculate GHGs but they are able to provide additional information which can be useful for tracking progress over time.⁴¹

Sources of Emissions 2005		Equiv CO ₂ (tonnes)	Energy (MMBtu)	Cost (\$)
Buildings and Facilities				
City Hall – Electricity				
	Per 1000 sq. ft.	0	0.2	\$5.3
	Per hour of operation	0.2	2	\$60.6
	Per occupant	5.8	65.2	\$1,995.1
Police Department – Natural Gas				
	Per 1000 sq. ft.	0	0.1	\$1.2
	Per hour of operation	0	0.4	\$3.6
	Per occupant	4.2	79.0	\$788.5
Fire Station 1– Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0.2	0	\$0.3
	Per occupant	0.4	8.4	\$102.3
Fire Station 2– Electricity				
	Per 1000 sq. ft.	0	0	\$1.8
	Per hour of operation	0	0	\$2.0
	Per occupant	2.4	26.7	\$1095
Fire Station 2 – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$0.3
	Per occupant	0.8	14.2	\$1184
Teen Center – Electricity				
	Per 1000 sq. ft.	0	0	\$0.8
	Per hour of operation	0	0	\$2.0
	Per occupant	9.9	111.4	\$4616
Teen Center – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0	\$0.6
	Per occupant	5.8	108.6	\$1307
Clubhouse – Electricity				
	Per 1000 sq. ft.	0	0	\$1.1
	Per hour of operation	0	0	\$2.9
	Per occupant	8.3	93.7	\$6421
Clubhouse – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.1
	Per occupant	0.7	12.5	\$212
Recreation Park, Joslyn – Electricity				
	Per 1000 sq. ft.	0	0.1	\$1.1
	Per hour of operation	0	0.1	\$1.6
	Per occupant	14.7	165.5	\$2786.3

⁴¹ Source of data CACP software output.

Recreation Park, Joslyn – Natural Gas				
Per 1000 sq. ft.	0	0	\$0.2	
Per hour of operation	0	0.1	\$0.3	
Per occupant	2.1	39.6	\$500	
Check Out Building – Natural Gas				
Per 1000 sq. ft.	0	0	\$0.1	
Per hour of operation	0	0.1	\$0.1	
Per occupant	0.3	6.5	\$96	
Hilltop Park – Natural Gas				
Per 1000 sq. ft.	0	0.1	\$1.7	
Per hour of operation	0	0.0	\$0.2	
Acacia Park– Natural Gas				
Per 1000 sq. ft.	0.1	1.4	\$14.4	
Per hour of operation	0.8	15.0	\$151.4	
Hardball Concession Stand – Natural Gas				
Per 1000 sq. ft.	0	0	\$0.2	
Per hour of operation	0	0	\$0.1	
Per occupant	0.2	4.3	\$108	
Softball Concession Stand – Natural Gas				
Per 1000 sq. ft.	0	0	\$0.3	
Per hour of operation	0	0	\$0.0	
Per occupant	0.1	2.1	\$83.5	
Main Library – Electricity				
Per 1000 sq. ft.	0	0.1	\$3.8	
Per hour of operation	0	0.3	\$12.8	
Per occupant	11.3	126.6	\$466.2	
Main Library – Natural Gas				
Per 1000 sq. ft.	0	0	\$0.5	
Per hour of operation	0	0.2	\$1.6	
Per occupant	3.0	55.6	\$577.2	
Annex – Electricity				
Per 1000 sq. ft.	0	0	\$0.6	
Per hour of operation	0	0.1	\$2.1	
Per occupant	6.7	75.7	\$3051	
Public Works Yard – Electricity				
Per 1000 sq. ft.	0	0.1	\$4.2	
Per hour of operation	0	0.2	\$7.8	
Per occupant	1.9	21.6	\$756.8	
Public Works Yard – Natural Gas				
Per 1000 sq. ft.	0	0.1	\$0.8	
Per hour of operation	0	0.1	\$1.5	
Per occupant	0.7	13.4	\$143.3	
Pro Shop at Golf Course – Electricity				
Per 1000 sq. ft.	0	0	\$0.6	
Per occupant	2.1	24	\$1036.3	
Golf Course Main Building – Electricity				
Per 1000 sq. ft.	0	0	\$0.2	
Per occupant	0.3	3.8	\$181.8	
Golf Course Main Building – Natural Gas				
Per 1000 sq. ft.	0	0.1	\$0.8	
Per occupant	3.9	72.9	\$700.7	
Water Yard – Electricity				
Per 1000 sq. ft.	0	0	\$1.6	

	Per hour of operation	0	0.1	\$3.2
	Per occupant	1.7	18.7	\$885.6
Water Yard – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.1
	Per hour of operation	0	0	\$0.1
	Per occupant	0.1	2.4	\$39.8
Demo House Sound Proofing – Electricity				
	Per 1000 sq. ft.	0	0	\$0.1
Camp Eucalyptus – Electricity				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0	\$0.3
Urho Saari Swim Stadium (The Plunge) – Natural Gas				
	Per 1000 sq. ft.	0	0.7	\$7.1
	Per hour of operation	0	0.6	\$6.3
	Per occupant	42.2	793.4	\$7719.5
Sector Average				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0.1	\$0.5
	Per occupant	5.2	19.8	\$156.7
Streetlights & Traffic Signals				
Traffic Signals/Controllers				
	Per streetlight account	3	33.7	\$1,173.3
Streetlight				
	Per streetlight account	2	22.4	\$514.4
Streetlight SCE Owned				
	Per streetlight account	403.5	4533.7	\$207,049.0
Park Lighting				
	Per streetlight account	54.8	615.7	\$10,340.0
Tree Wells-Up Lighting				
	Per streetlight account	0.8	8.6	\$526.0
Field Lighting				
	Per streetlight account	31.6	355.5	\$6,091.0
City Parking Lot Lighting/Misc.				
	Per streetlight account	0	0	\$354.0
Decorative Lighting				
	Per streetlight account	0.1	1.1	\$210.0
Sector Lighting				
	Per streetlight account	8.4	94.9	\$3,373.0
Vehicle Fleet				
Dept. 2402 Planning/Bldg Safety				
	Per vehicle	0.4	5.3	\$89.4
Dept. 2403 Bldg Safety				
	Per vehicle	2.8	38.6	\$683.3
Dept. 2501 Finance Admin				
	Per vehicle	0.1	2	\$30.3
Dept. 2601 PW Gov Bldgs				
	Per vehicle	2.6	35.8	\$633.5
2901 Non departmental				
	Per vehicle	0.5	6.6	\$113.2
Dept. 3101 Police Admin				

	Per vehicle	8.7	119.4	\$2,063.2
Dept. 3105 Police Community Relations				
	Per vehicle	1.5	20.4	\$340.9
Dept. 3202 Fire Suppression				
	Per vehicle	6.4	88	\$1,395.3
Dept. 4101 PW Engineering				
	Per vehicle	0.6	8.6	\$153.9
Dept. 4202 PW Street Maintenance				
	Per vehicle	3.7	51.3	\$853.6
Dept. 4205 PW Traffic Safety				
	Per vehicle	3.3	47.2	\$838.3
Dept. 4301 PW Wastewater				
	Per vehicle	4.9	67.2	\$1,157.2
Dept. 4601 PW Equipment Main				
	Per vehicle	2.2	31	\$566.1
Dept. 5102 Parks operations				
	Per vehicle	4.1	56.3	\$976.5
Dept. 5201 Parks operations				
	Per vehicle	0.9	12.4	\$200.4
Dept. 5292 Recreation Prop A "Dial A Ride"				
	Per vehicle	12.9	183.1	\$3,247.2
Dept. 6601 Community Cable Div				
	Per vehicle	0.5	6.3	\$99.9
Dept. 7102 Water Div				
	Per vehicle	3.2	43.9	\$776.6
Sector Average				
	Per vehicle	5.5	75.4	\$1,290.9
Employee Commute				
Carpool Group				
	Per vehicle	1.5	20.6	n/a
Drove Alone				
	Per vehicle	2.5	34.6	n/a
Public Transportation				
	Per vehicle	0.1	1.0	n/a
Sector Average				
	Per vehicle	2.4	33.2	n/a
Solid Waste				
El Segundo Refuse				
	Per employee	0.3	0	0
Sector Average				
	Per employee	0.5	0.3	0

Sources of Emissions 2007		Equiv CO₂ (tonnes)	Energy (MMBtu)	Cost (\$)
Buildings and Facilities				
City Hall – Electricity				
	Per 1000 sq. ft.	0	0.2	\$6.0
	Per hour of operation	0.2	1.9	\$68.0
	Per occupant	0.2	61.0	\$2238.4
Police Department – Natural Gas				
	Per 1000 sq. ft.	0	0.1	\$0.8
	Per hour of operation	0	0.3	\$2.5
	Per occupant	3.2	61.1	\$547
Fire Station 1– Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$0.3
	Per occupant	0.5	8.9	\$102.5
Fire Station 2– Electricity				
	Per 1000 sq. ft.	0	0	\$1.8
	Per hour of operation	0	0	\$1.0
	Per occupant	2.3	27.4	\$1141
Fire Station 2 – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$0.2
Teen Center – Electricity				
	Per 1000 sq. ft.	0	0	\$1.1
	Per hour of operation	0	0.1	\$2.6
	Per occupant	10.8	126.5	\$5965
Teen Center – Natural Gas				
	Per 1000 sq. ft.	0	0.1	\$0.6
	Per hour of operation	0	0.1	\$1.4
	Per occupant	15.7	294.7	\$3103
Clubhouse – Electricity				
	Per 1000 sq. ft.	0	0	\$1.2
	Per hour of operation	0	0.1	\$3.3
	Per occupant	13.9	162.6	\$7183.5
Clubhouse – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0
	Per hour of operation	0	0.1	\$0.1
	Per occupant	0.9	16.7	\$246
Recreation Park, Joslyn – Electricity				
	Per 1000 sq. ft.	0	0.1	\$2.5
	Per hour of operation	0	0.1	\$3.6
	Per occupant	13.6	158.5	\$6088
Recreation Park, Joslyn – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$0.4
	Per occupant	3.5	65.5	\$741.3
Check Out Building – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.1
	Per hour of operation	0	0	\$0.1
	Per occupant	0.4	7.2	\$106.2
Hilltop Park – Natural Gas				
	Per 1000 sq. ft.	0	0.2	\$1.7

	Per hour of operation	0	0	\$0.2
Acacia Park– Natural Gas				
	Per 1000 sq. ft.	0.1	1.3	\$12.6
	Per hour of operation	0	0	\$0.4
Hardball Concession Stand – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0	\$0.1
	Per occupant	0.2	4.2	\$115
Softball Concession Stand – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$0
	Per occupant	0.1	2.4	\$89
Main Library – Electricity				
	Per 1000 sq. ft.	0	0.1	\$3.7
	Per hour of operation	0	0.3	\$12.4
	Per occupant	10.2	118.5	\$4,512.1
Main Library – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.4
	Per hour of operation	0	0.2	\$1.5
	Per occupant	2.9	55.2	\$533.7
Annex – Electricity				
	Per 1000 sq. ft.	0	0	\$0.6
	Per hour of operation	0	0.1	\$2.2
	Per occupant	6.8	79.3	\$3,216.7
Public Works Yard – Electricity				
	Per 1000 sq. ft.	0	0.1	\$4.2
	Per hour of operation	0	0.2	\$7.8
	Per occupant	1.8	20.9	\$756.1
Public Works Yard – Natural Gas				
	Per 1000 sq. ft.	0	0.1	\$0.9
	Per hour of operation	0	0.2	\$1.7
	Per occupant	0.9	16.5	\$165.2
Pro Shop at Golf Course – Electricity				
	Per 1000 sq. ft.	0	0	\$0.8
	Per hour of operation	2.3	27	\$1309.7
Golf Course Main Building – Electricity				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0.4	4.3	\$234.2
Golf Course Main Building – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0.7	13.8	\$169.3
Water Yard – Electricity				
	Per 1000 sq. ft.	0	0	\$1.4
	Per hour of operation	0	0.1	\$2.6
	Per occupant	1.5	18	\$743.9
Water Yard – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.1
	Per hour of operation	0	0	\$0.1
	Per occupant	0.1	2.0	\$35
Camp Eucalyptus – Electricity				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0	\$0.3
Urho Saari Swim Stadium (The Plunge) – Natural Gas				

	Per 1000 sq. ft.	0	0.8	\$6.6
	Per hour of operation	0	0.7	\$5.8
	Per occupant	43.6	819.3	\$7172.8
Sector Average				
	Per 1000 sq. ft.	0	0	\$0.2
	Per hour of operation	0	0.1	\$0.4
	Per occupant	5.0	20.5	\$149.5
Streetlights & Traffic Signals				
Traffic Signals/Controllers				
	Per streetlight account	2.5	29	\$1,141.7
Streetlight				
	Per streetlight account	1.8	21	\$597.7
Streetlight SCE Owned				
	Per streetlight account	399.5	4657.7	\$259,443.0
Park Lighting				
	Per streetlight account	54	629.5	\$41,029.0
Tree Wells-Up Lighting				
	Per streetlight account	0.3	3.5	\$345.7
Field Lighting				
	Per streetlight account	5.4	62.7	\$4,642.8
City Parking Lot Lighting/Misc.				
	Per streetlight account	0.1	0.7	\$405.0
Decorative Lighting				
	Per streetlight account	0.1	1.2	\$243.0
Sector Average				
	Per streetlight account	7.5	87.4	\$4,626.6
Vehicle Fleet				
Dept. 2402 Planning/Bldg Safety				
	Per vehicle	2	27.5	\$576.0
Dept. 2403 Bldg Safety				
	Per vehicle	2.2	30.1	\$615.9
Dept. 2501 Finance Admin				
	Per vehicle	0.4	5	\$103.7
Dept. 2601 PW Gov Bldgs				
	Per vehicle	1.6	22.3	\$461.4
2901 Non departmental				
	Per vehicle	0.7	9.9	\$198.0
Dept. 3101 Police Admin				
	Per vehicle	7	97	\$2,055.5
Dept. 3105 Police Community Relations				
	Per vehicle	3.6	50.1	\$1,026.2
Dept. 3202 Fire Suppression				
	Per vehicle	7	95.3	\$1,785.2
Dept. 4101 PW Engineering				
	Per vehicle	1.6	21.9	\$441.7
Dept. 4202 PW Street Maintenance				
	Per vehicle	3	41.6	\$813.2
Dept. 4205 PW Traffic Safety				
	Per vehicle	3.4	48.7	\$1,029.0
Dept. 4301 PW Wastewater				

	Per vehicle	9.2	126.6	\$2,413.4
Dept. 4601 PW Equipment Main				
	Per vehicle	2	27.7	\$584.0
Dept. 5102 Parks operations				
	Per vehicle	3.8	53	\$1,079.9
Dept. 5201 Parks operations				
	Per vehicle	0.6	8.4	\$173.1
Dept. 5292 Recreation Prop A "Dial A Ride"				
	Per vehicle	14	202.1	\$4,199.3
Dept. 6601 Community Cable Div				
	Per vehicle	0.2	2.4	\$51.5
Dept. 7102 Water Div				
	Per vehicle	3.9	53.6	\$1,086.8
Sector Average				
	Per vehicle	5.5	76.5	\$1,559.9

Employee Commute

Employee Commute				
Carpool Group				
	Per vehicle	1.7	22.9	n/a
Drove Alone				
	Per vehicle	2.4	33	n/a
Public Transportation				
	Per vehicle	0.1	1.2	n/a
Sector Average				
	Per vehicle	2.3	31.7	n/a

Solid Waste

Solid Waste				
El Segundo Refuse				
	Per employee	0.3	0	0
Sector Average				
	Per employee	0.5	0.3	0

Sources of Emissions 1990

		Equiv CO ₂ (tonnes)	Energy (MMBtu)	Cost (\$)
Buildings and Facilities				
City Hall – Electricity				
	Per 1000 sq. ft.	0	0.2	\$4.1
	Per hour of operation	0.2	1.8	\$47.0
	Per occupant	8.0	57.9	\$1545.7
Police Department – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0	0.4	\$0.0
Fire Station 1– Natural Gas				
	Per 1000 sq. ft.	0	0.1	\$0.0
Fire Station 2– Electricity				
	Per 1000 sq. ft.	0	0	\$0.9
	Per hour of operation	0	0	\$1.1
	Per occupant	2.3	16.3	\$578.4
Fire Station 2 – Natural Gas				

	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0	0.2	\$0.0
Teen Center – Electricity				
	Per 1000 sq. ft.	0	0	\$0.6
	Per hour of operation	0	0	\$1.4
	Per occupant	11.6	84.1	\$3262
Teen Center – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0	0.2	\$0.0
Clubhouse – Electricity				
	Per 1000 sq. ft.	0	0	\$1.1
	Per hour of operation	0	0.1	\$2.9
	Per occupant	51.7	375.6	\$0.0
Clubhouse – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0.1	1.0	\$0.0
Recreation Park, Joslyn – Electricity				
	Per 1000 sq. ft.	0	0.2	\$7.9
	Per hour of operation	0	0.3	\$11.4
	Per occupant	81.3	590.5	\$19,338.7
Recreation Park, Joslyn – Natural Gas				
	Per occupant	0	0.4	\$0.0
Check Out Building – Natural Gas				
	Per occupant	0	0.4	\$0.0
Softball Concession Stand – Natural Gas				
	Per occupant	0	0.1	\$0.0
Main Library – Electricity				
	Per 1000 sq. ft.	0	0	\$0.4
	Per hour of operation	0	0.1	\$1.4
	Per occupant	2.6	19.1	\$500.3
Main Library – Natural Gas				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0	0.4	\$0.0
Annex – Electricity				
	Per 1000 sq. ft.	0	0	\$0.3
	Per hour of operation	0	0	\$1.2
	Per occupant	6.6	47.8	\$1677.3
Public Works Yard – Electricity				
	Per occupant	0	0.1	\$2.6
	Per hour of operation	0	0.2	\$4.7
	Per occupant	2.1	15.5	\$459.4
Public Works Yard – Natural Gas				
	Per occupant	0	0	\$0.0
	Per hour of operation	0	0	\$0.0
	Per occupant	0	0.1	\$0.0
Water Yard – Electricity				
	Per 1000 sq. ft.	0	0	\$1.1
	Per hour of operation	0	0.1	\$2.2
	Per occupant	2.7	19.8	\$615.7

Water Yard – Natural Gas				
	Per occupant	0	0.1	\$0.0
Urho Saari Swim Stadium (The Plunge) – Natural Gas				
	Per occupant	0.2	3.8	\$0.0
Sector Average				
	Per 1000 sq. ft.	0	0	\$0.0
	Per hour of operation	0	0.2	\$0.0
	Per occupant	3.8	3.7	\$3.8
Streetlights & Traffic Signals				
Traffic Signals/Controllers				
	Per streetlight account	9.6	69.9	\$2,065.5
Streetlight				
	Per streetlight account	3.1	22.6	\$499.6
Streetlight SCE Owned				
	Per streetlight account	624.4	4533.7	\$207,049.0

Appendix E—Results from Employee Commute Survey

An employee commute survey was conducted for the years 2007 and 2005 in order to gather scope 3 GHG emissions based on vehicle miles traveled by employees. In 2007, there were approximately 308 full-time and 50.95 full-time equivalent employees; however, there were 165 employees that took the survey resulting in a 46% response rate. For 2005, there were 299 full-time and 52.6 full-time equivalent employees; however, there were only 158 employees that took the survey who worked for the City in 2005 resulting in a 45% response rate. To capture the remaining VMT for the total number of employees that worked in those years, estimates were derived from the survey responses. Assumptions for the estimated portion include: employees drove alone in gasoline run passenger vehicles.⁴²

Employee commute information is considered policy relevant and may be utilized to reduce GHG emissions through potential measures captured in the climate action plan. Additionally, this information may be useful for planning strategies to comply with SB 375.⁴³ For questions 4 and 14, the miles were grouped to identify individuals that were potential walkers, cyclists, carpools, public transit users, and vanpoolers: 0-1.9 (potential walkers), 2-3.9 miles (potential bicyclists); 4-8.9 miles (potential transit users); 9-19.9 (potential carpools); and 20-40 miles and above (long distance carpools and vanpools).

Based on information provided by respondents in the year 2007, 46% of employees traveled 786,711 vehicle miles to the worksite. Within this response rate, 8.5% of employees carpooled to the worksite; 78.6% of them were two-person carpools; 22% of employees lived within a range of 0 to 1.9 miles from the worksite (potential walkers). Results from question 10 indicate 44.8% of respondents are interested in participating in a ridesharing program.

In the year 2005, 45% of employees traveled 751,558 vehicle miles to the worksite. Within this response rate, 1.9% of employees carpooled to the worksite; 100% of them were two-person carpools; 25.3% of employees lived within a range of 0 to 1.9 miles from the worksite.

A. 2007 Survey Results⁴⁴

1. Employee Information		
	Response Percent	Response Count
Name: <input type="text"/>	100.0%	165
Dept: <input type="text"/>	100.0%	165
	<i>answered question</i>	165
	<i>skipped question</i>	0

⁴² See appendix C for a description of the computational method.

⁴³ See appendix F for description of the legislation.

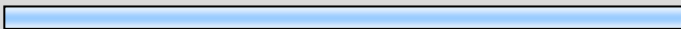

⁴⁴ Survey Monkey, an online survey website was utilized to conduct the survey and generate graphs www.surveymonkey.com

2. What city did you live in?		
	Response Percent	Response Count
City: <input type="text"/>	100.0%	165
ZIP Code: <input type="text"/>	100.0%	165
	<i>answered question</i>	165
Cities Listed in Survey:	<i>skipped question</i>	0
Agoura Hills, Altadena, Brea, Carson, Castaic, Chino Hills, Corona, Costa Mesa, Culver City, Dana point, Del Aire, Downey, El Segundo, Fountain Valley, Garden Grove, Gardena, Hawthorne, Huntington Beach, Inglewood, Irvine, La Mirada, La Verne, Laguna Hills, Laguna Niguel, Lakewood, Lawndale, Lomita, Long Beach, Los Alamitos, Los Angeles, Manhattan Beach, Marina del Rey, Mission Viejo, Murrieta, Newbury Park, Norwalk, Orange County, Palos Verdes, Playa Del Rey, Rancho Palos Verdes, Rancho Santa Margarita, Redondo Beach, San Gabriel, San Pedro, Santa Monica, Saugus, Seal Beach, Surfside, Thousand Oaks, Torrance, Trabuco Canyon, Upland, Valencia, Victorville, Westchester, Wildomar, Yorba Linda.		

3. What was your workweek schedule?		
	Response Percent	Response Count
3/36 work week (2 days off) <input type="checkbox"/>	9.6%	16
4/40 work week (1 day off) <input type="checkbox"/>	20%	33
9/80 work week (1 day off every other week) <input type="checkbox"/>	51%	84
Regular work week <input type="checkbox"/>	8.0%	13
Other (skipped question) <input type="checkbox"/>	12%	20
	<i>answered question</i>	165

4. On average, how many miles did you travel to work round trip each day?		
786,711 vehicle miles traveled represents a 46% response rate (1,652,093 estimated total VMT based on number of full-time and full-time equivalent employees)		
Commute distance range from worksite (one way)	Response Percent	Response Count
0-1.9 miles <input type="checkbox"/>	22%	36
2-3.9 miles <input type="checkbox"/>	8.5%	14
4-8.9 miles <input type="checkbox"/>	20%	33
9-19.9 miles <input type="checkbox"/>	17.5%	29
20-40.9 miles <input type="checkbox"/>	17.5%	29
40 miles and above <input type="checkbox"/>	14.5%	24
	<i>Number of respondents that worked for the city in 2007</i>	165

5. On average, how many days a week did you...								
Day(s) a week								
	1	2	3	4	5	6	7	Response Count
Drive alone to work?	8.8% (13)	11.5% (17)	7.4% (11)	25.0% (37)	45.3% (67)	0.7% (1)	1.4% (2)	148
Carpool/Vanpool to work?	7.7% (1)	30.8% (4)	0.0% (0)	15.4% (2)	46.2% (6)	0.0% (0)	0.0% (0)	13
Take public transportation to work?	0.0% (0)	66.7% (2)	0.0% (0)	0.0% (0)	33.3% (1)	0.0% (0)	0.0% (0)	3
Bicycle to work?	66.7% (4)	0.0% (0)	0.0% (0)	33.3% (2)	0.0% (0)	0.0% (0)	0.0% (0)	6
Walk to work?	25.0% (3)	0.0% (0)	33.3% (4)	16.7% (2)	25.0% (3)	0.0% (0)	0.0% (0)	12
Use another form of transportation to get to work?	60.0% (3)	40.0% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	5
<i>answered question</i>								165
<i>skipped question</i>								0

6. If you carpooled/vanpooled, how many other people traveled with you on average?			
8.5 % of respondents who worked for the city in 2007 participated in carpooling		Response Percent	Response Count
2 people		78.6%	11
3 people		21.4%	3
<i>answered question</i>			14
<i>skipped question</i>			151



7. If you used Public Transportation, what is the name of the public transit system?		
	Response Count	
Beach City Transit, Los Angeles MTA, Metro Greenline	5	
	5	
<i>skipped question</i>		160

8. If you drove, what type of vehicle did you drive most often?		
	Response Frequency	Response Count
Auto-full size (e.g., Ford Taurus, Lincoln Town Car)	12.7%	21
Auto-mid size (e.g., Honda Accord, Toyota Camry)	27.3%	45
Auto-compact (e.g., Honda Civic, Toyota Corolla)	15.2%	25
Light truck/SUV (e.g., Chevy Suburban, Ford Expedition)	38.2%	63
Heavy truck (e.g., Tractor-trailer truck)	0.6%	1
Motorcycle	4.8%	8
Van	1.2%	2
City Vehicle	6.1%	10
<i>answered question</i>		165
<i>skipped question</i>		0


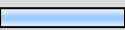

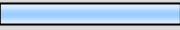
9. For the vehicle you drove most often, what type of fuel does it use?		
	Response Percent	Response Count
Gasoline	96.9%	160
Diesel	1.2%	2
Ultra-low sulfur diesel	0.6%	1
Bio-diesel	0.0%	0
Hybrid	1.8%	1
ethanol	0.0%	0
electric	0.0%	0
LPG	0.0%	0
CNG	0.0%	0
<i>answered question</i>		165
<i>skipped question</i>		0

10. Would you be interested in participating in a ridesharing program i.e., carpooling, vanpooling, walking, bicycling, or using public transit to commute to work?		
	Response Percent	Response Count
Yes	44.8%	74
No	55.2%	91
<i>answered question</i>		165
<i>skipped question</i>		0

B. 2005 Survey Results




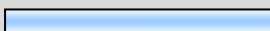


11. If you worked for the city in 2005, would you say your travel to work was about the same as 2007?		
	Response Percent	Response Count
Yes--Skip the 2005 section and go to the end and hit done. 	81.2%	134
No--Click next and complete information for 2005. 	3.3%	31
<i>answered question</i>		165
<i>skipped question</i>		0

12. What city did you live in?		
	Response Percent	Response Count
City: 	100.0%	43
ZIP Code: 	97.7%	42
<i>answered question</i>		43
<i>skipped question</i>		122
Cities Listed in Survey:		
Agoura Hills, Altadena, Brea, Carson, Castaic, Chino Hills, Corona, Costa Mesa, Culver City, Dana point, Del Aire, Downey, El Segundo, Fountain Valley, Fullerton, Garden Grove, Gardena, Glendora, Hawthorne, Huntington Beach, Inglewood, Irvine, La Mirada, La Verne, Laguna Hills, Laguna Niguel, Lakewood, Lawndale, Lomita, Long Beach, Los Alamitos, Los Angeles, Manhattan Beach, Marina del Rey, Mission Viejo, Murrieta, Newbury Park, Norwalk, Orange County, Palos Verdes, Playa Del Rey, Rancho Palos Verdes, Rancho Santa Margarita, Redondo Beach, San Gabriel, San Pedro, Santa Monica, Saugus, Seal Beach, Surfside, Thousand Oaks, Torrance, Trabuco Canyon, Upland, Valencia, Van Nuys, Victorville, Westchester, Wildomar, Yorba Linda		

13. What was your workweek schedule?		
	Response Percent	Response Count
3/36 work week (2 days off) 	2.8%	1
4/40 work week (1 day off) 	16.7%	6
9/80 work week (1 day off every other week) 	52.8%	19
Regular work week 	27.8%	10
<i>answered question</i>		36
<i>skipped question</i>		129

14. On average, how many miles did you travel to work round trip each day?

751,558 vehicle miles traveled represents a 45% response rate
(1,653,428 estimated total VMT based on number of employees)


Commute distance range from worksite (one way)		Response Percent	Response Count
0-1.9 miles		25.3%	40
2-3.9 miles		7%	11
4-8.9 miles		18.3%	29
9-19.9 miles		18.3%	29
20-40.9 miles		22%	34
40 miles and above		9.4%	15
<i>Number of respondents that worked for the city in 2005</i>			158

15. On average, how many days a week did you...

Day(s) a week	Day(s) a week							Response Count
	1	2	3	4	5	6	7	
Drive alone to work?	11.8% (4)	2.9% (1)	2.9% (1)	20.6% (7)	58.8% (20)	2.9% (1)	0.0% (0)	34
Carpool/Vanpool to work?	50.0% (1)	0.0% (0)	0.0% (0)	50.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)	2
Take public transportation to work?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	100.0% (2)	0.0% (0)	0.0% (0)	2
Bicycle to work?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0
Walk to work?	0.0% (0)	0.0% (0)	0.0% (0)	50.0% (2)	50.0% (2)	0.0% (0)	0.0% (0)	4
Use another form of transportation to get to work?	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	0
<i>answered question</i>								39
<i>skipped question</i>								126

16. If you carpooled/vanpooled, how many other people traveled with you on average?

Out 158 respondents who worked for the city in 2005 1.9% participated in carpooling

		Response Percent	Response Count
2 people		100%	3
3 people		0.0%	0
<i>answered question</i>			3
<i>skipped question</i>			162

17. If you used Public Transportation, what is the name of the public transit system?	
MTA, Metro Greenline	Response Count 2
<i>answered question</i> 2	
<i>skipped question</i> 162	

18. If you drove, what type of vehicle did you drive most often?		
	Response Percent	Response Count
Auto-full size (e.g., Ford Taurus, Lincoln Town Car) <input type="checkbox"/>	5.4%	2
Auto-mid size (e.g., Honda Accord, Toyota Camry) <input type="checkbox"/>	29.7%	11
Auto-compact (e.g., Honda Civic, Toyota Corolla) <input type="checkbox"/>	13.5%	5
Light truck/SUV (e.g., Chevy Suburban, Ford Expedition) <input type="checkbox"/>	35.1%	13
Heavy truck (e.g., Tractor-trailer truck)	0.0%	0
Motorcycle <input type="checkbox"/>	2.7%	1
Van <input type="checkbox"/>	2.7%	1
City Vehicle <input type="checkbox"/>	10.8%	4
<i>answered question</i>		37
<i>skipped question</i>		128

20. For the vehicle you drove most often, what type of fuel does it use?		
	Response Percent	Response Count
Gasoline <input type="checkbox"/>	100.0%	36
Diesel	25.0%	1
Ultra-low sulfur diesel	25.0%	1
Bio-diesel	0.0%	0
Hybrid	0.0%	0
ethanol	0.0%	0
electric	0.0%	0
LPG	0.0%	0
CNG	0.0%	0
<i>answered question</i>		36
<i>skipped question</i>		129

Appendix F—Climate Change Action

For reference, listed below are some of the key climate change policies that have been adopted at an international level as well as at State and Regional levels.⁴⁵

AB 811, 2008—Gives counties and local governments authority to create benefit assessment districts which allow property owners to finance energy efficiency upgrades, such as solar panels, efficient air conditioning and ventilation systems, and tankless water heating equipment. Owners may enter a loan contract with a local government and pay it back through their property-tax bill. This legislation will help to reduce GHG emissions and stimulate energy efficiency upgrades.

SB 375 Steinberg, 2008—Advances the State's efforts to achieve the global warming goals consistent with AB 32. It aligns three critical policy areas of importance to local government: (1) regional long-range transportation plans and investments; (2) regional allocation of the obligation for cities and counties to zone for housing; and (3) a process to achieve greenhouse gas emissions reductions targets for the transportation sector.

SB 97 Dutton, 2007—States that GHGs and their effects are subject to the California Environmental Quality Act (CEQA). CEQA requires that agencies identify a given project's potentially significant effects on the environment and mitigate those significant effects whenever feasible. Public agencies such as local governments are therefore obligated to determine whether a given project's climate change-related impacts are significant and to mitigate any significant effects. CARB is responsible for recommending where the threshold of "significance" lies.

SB 107 Simitian, 2006—Requires investor-owned utilities (IOUs) to increase the share of renewable energy sources (e.g., wind, solar, geothermal) in their electricity mix to 20 percent by 2010. Known as the Renewables Portfolio Standard (RPS), the law is intended to decrease California's reliance on fossil fuel and reduce GHG emissions from the electricity sector. As of 2008, about 12 percent of California's electricity demand is met with renewable resources. Governor Schwarzenegger has since called for 33 percent of California's electricity to be provided by renewable sources by 2020.

AB 32 Nunez & Pavley, 2006—Institutes a mandatory limit on greenhouse gas emissions -- reducing emissions in California to 1990 levels by the year 2020 below forecasted levels. The bill also directs the California Air Resources Board (CARB) to establish a mandatory reporting system to track and monitor emission levels and requires CARB to develop various compliance options and enforcement mechanisms.

U.S. Mayors' Climate Protection Agreement, 2005—Creates a commitment to strive to meet or beat, by 2012, the Kyoto Protocol target of a seven percent reduction in greenhouse gas emissions below 1990 levels. The agreement was initiated by Seattle Mayor Greg Nickels.

AB 1493 Pavley, 2002—Requires the State Air Resources Board to develop and adopt regulations that achieve the maximum feasible reduction of greenhouse gases from vehicles primarily used for non-commercial transportation by January 2005.

⁴⁵ The California Air Resources Board website was a source of information for the legislation listed above. To find more information on the legislation visit the website at <http://www.arb.ca.gov/cc/cc.htm>. For more information on the U.S. Mayors' Climate Protection Agreement visit their website at <http://usmayors.org/climateprotection/agreement.htm>. To learn more about AB 811 visit the Los Angeles County website at <http://portal.lacounty.gov/wps/portal/lac/home>.

Kyoto Protocol 1997—A protocol to the United Nations Framework Convention on Climate Change (UNFCCC) requiring industrialized nations to reduce their collective greenhouse gas emissions 5.2% below 1990 levels. As of January 2007, 162 countries have ratified the Protocol, with the United States and Australia most notably absent from the list.

Rio Earth Summit in 1992—Created the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is a milestone treaty on Climate Change that provides an overall framework for international efforts to mitigate climate change.

Appendix G—Abbreviations and Acronyms⁴⁶

Btu	British thermal unit
CH4	methane
CO	carbon monoxide
CO2	carbon dioxide
CO2e	carbon dioxide equivalent
FE	Fuel Economy
GHG	greenhouse gas
HFC	hydrofluorocarbon
MMBtu	1 million British thermal unit
NOx	oxides of nitrogen
N2O	nitrous oxide
PFC	perfluorocarbon
PM10	particulate matter smaller than ten microns in diameter
SF6	sulfur hexafluoride
SOx	sulfur oxides
VOC	volatile organic compounds

Appendix H—Glossary of Terms⁴⁷

Activity data	Data on the magnitude of a human activity resulting in emissions taking place during a given period of time. Data on energy use, fuel used, miles traveled, input material flow, and product output are all examples of activity data that might be used to compute GHG emissions.
Base year	A specific year against which an entity's emissions are tracked over time.
Base year emissions	GHG emissions in the base year.
Boundaries	GHG accounting and reporting boundaries can have several dimensions, i.e., organizational, operational and geographic. These boundaries determine which emissions are accounted for and reported by the entity.
Biogenic emissions from combustion	CO2 emissions produced from combusting a variety of biofuels and biomass, such as biodiesel, ethanol, wood, wood waste and landfill gas.
Calendar year	The time period from January 1 through December 31.
Carbon dioxide (CO2)	The most common of the six primary GHGs, consisting of a single carbon atom and two oxygen atoms, and providing the reference point for the GWP of other gases. (Thus, the GWP of CO2 is equal to 1.)

⁴⁶ Abbreviations and acronyms are from the Local Government Operations Protocol, version 1.0

⁴⁷ Definition are from the Local Government Operations Protocol, version 1.0 and ICLEI's Cities for Climate Protection Milestone Guide.

CO2 equivalent (CO _{2e})	The universal unit for comparing emissions of different GHGs expressed in terms of the GWP of one unit of carbon dioxide.
Control approach	An emissions accounting approach for defining organizational boundaries in which an entity reports 100 percent of the GHG emissions from operations under its financial or operational control.
Criteria Air Pollutants	The term criteria air pollutants refers to pollutants that are regulated under the U.S. Clean Air Act. As with carbon dioxide, the major sources of these pollutants are fossil fuels. Most measures that reduce carbon dioxide emissions also reduce criteria air pollutants. Criteria air pollutants include nitrogen oxides (NO _x), volatile organic compounds (VOCs), carbon monoxide (CO), sulfur oxides (SO _x), and particulate matter smaller than ten microns in diameter (PM-10). The CACP software provides estimated emissions of CAPs as well as GHGs for emissions analyses and reduction benefits of measures.
Direct emissions	Emissions from sources within the reporting entity's organizational boundaries that are owned or controlled by the reporting entity, including stationary combustion emissions, mobile combustion emissions, process emissions, and fugitive emissions. All direct emissions are Scope 1 emissions, with the exception of biogenic CO ₂ emissions from biomass combustion.
Emission factor	A unique value for determining an amount of a GHG emitted on a per unit activity basis (for example, metric tons of CO ₂ emitted per million Btus of coal combusted, or metric tons of CO ₂ emitted per kWh of electricity consumed).
Facility	Any property, plant, building, structure, stationary source, stationary equipment or grouping of stationary equipment or stationary sources located on one or more contiguous or adjacent properties, in actual physical contact or separated solely by a public roadway or other public right-of way, and under common operational or financial control, that emits or may emit any greenhouse gas.
Global warming potential (GWP)	The ratio of radiative forcing (degree of warming to the atmosphere) that would result from the emission of one mass-based unit of a given G GHG compared to one equivalent unit of carbon dioxide (CO ₂) over a given period of time.
Greenhouse gases (GHGs)	For the purposes of this Protocol, GHGs are the six gases identified in the Kyoto Protocol: carbon dioxide (CO ₂), nitrous oxide (N ₂ O), methane (CH ₄), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF ₆).
Indirect emissions	Emissions that are a consequence of activities that take place within the organizational boundaries of the reporting entity, but that occur at sources owned or controlled by another entity. For example, emissions of electricity used by a manufacturing entity that occur at a power plant represent the manufacturer's indirect emissions.

Inventory	A comprehensive, quantified list of an organization's GHG emissions and sources.
Inventory boundary	An imaginary line that encompasses the direct and indirect emissions included in the inventory. It results from the chosen organizational and operational boundaries.
Methane (CH ₄)	One of the six primary GHGs, consisting of a single carbon atom and four hydrogen atoms, possessing a GWP of 21, and produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion.
Metric ton (MT, tonne)	Common international measurement for the quantity of GHG emissions, equivalent to about 2,204.6 pounds or 1.1 short tons.
Mobile combustion	Emissions from the combustion of fuels in transportation sources (e.g., cars, trucks, buses, trains, airplanes, and marine vessels) and emissions from non-road equipment such as equipment used in construction, agriculture, and forestry. A piece of equipment that cannot move under its own power but that is transported from site to site (e.g., an emergency generator) is a stationary, not a mobile, combustion source.
Nitrous oxide (N ₂ O)	One of the six primary GHGs, consisting of two nitrogen atoms and a single oxygen atom, possessing a GWP of 310, and typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning.
Operational boundaries	The boundaries that determine the direct and indirect emissions associated with operations within the entity's organizational boundaries.
Operational control	Full authority to introduce and implement operating policies at an operation.
Organizational boundaries	The boundaries that determine the operations owned or controlled by the reporting entity, depending on the consolidation approach taken.
Perfluorocarbons (PFCs)	One of the six primary GHGs, consisting of a group of man-made chemicals composed of one or two carbon atoms and four to six fluorine atoms, containing no chlorine. Originally introduced as alternatives to ozone depleting substances, PFCs have few commercial uses and are typically emitted as by-products of industrial and manufacturing processes. PFCs have very high GWPs and live a long time in the atmosphere.
Scope	Defines the operational boundaries in relation to indirect and direct GHG emissions.
Scope 1 emissions	All direct GHG emissions, with the exception of direct CO ₂ emissions from biogenic sources.
Scope 2 emissions	Indirect GHG emissions associated with the consumption of purchased or acquired electricity, heating, cooling, or steam.

Scope 3 emissions	All indirect emissions not covered in Scope 2. Examples include upstream and downstream emissions, emissions resulting from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, use of sold products and services, outsourced activities, recycling of used products, waste disposal, etc.
Stationary	Neither portable nor self propelled, and operated at a single facility.
Stationary combustion	Emissions from the combustion of fuels to produce electricity, steam, heat, or power using equipment (boilers, furnaces, etc.) in a fixed location.
Sulfur hexafluoride (SF6)	One of the six primary GHGs, consisting of a single sulfur atom and six fluoride atoms, possessing a very high GWP of 23,900, and primarily used in electrical transmission and distribution systems.
Therm	A measure of one hundred thousand (10 ⁵) Btu.