5.15 GLOBAL CLIMATE CHANGE

This section of the Recirculated Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the IBC Vision Plan and Mixed Use Overlay Zone Code (proposed project) to impact global climate change. The analysis in this section is based in part on the following technical report(s):

- *Irvine Business Complex Global Climate Change Technical Report*, CTG Energetics, Inc., December 2009
- *IBC VMT Estimates and Trip Reduction Strategies*, Fehr & Peers, November 2009
- *Irvine Business Complex Vision Plan Traffic Study*, Parsons Brinckerhoff, December 2009
- *CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act,* California Air Pollution Control Officers Association (CAPCOA), January 2008
- *Climate Change Scoping Plan*, California Air Resources Board (CARB), December 2008
- *Compass Blueprint 2% Strategy Opportunity Areas Maps*, Southern California Association of Governments (SCAG), 2008
- *The California Environmental Quality Act – Addressing Global Warming Impacts at the Local Agency Level*, Office of the California Attorney General, 2008

The Global Climate Change Technical Report and IBC VMT Estimates and Trip Reduction Strategies are included in Appendix P. In addition, construction emissions modeled using URBEMIS2007 are included in Appendix G.

5.15.1 Environmental Setting

Greenhouse Gases and Climate Change

Climate change is the variation of Earth's climate over time, whether due to natural variability or as a result of human activities. The climate system is interactive, consisting of five major components: the atmosphere, the hydrosphere (ocean, rivers, and lakes), the cryosphere (sea ice, ice sheets, and glaciers), the land surface, and the biosphere (flora and fauna). The atmosphere is the most unstable and rapidly changing part of the system. It is made up of 78.1 percent nitrogen (N_2), 20.9 percent oxygen (O_2), and 0.93 percent argon (Ar). These gases have only limited interaction with the incoming solar radiation and do not interact with infrared (long-wave) radiation emitted by the Earth. However, there are a number of trace gases, such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3), that absorb and emit infrared radiation and therefore have an affect on climate. These are greenhouse gases (GHG), and while they comprise less than 0.1 percent of the total volume mixing ratio in dry air, they play an essential role in influencing climate (IPCC 2001).

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Non-CO_2 GHG are those listed in the Kyoto Protocol[1] (CH_4, N_2O, hydrofluorocarbons [HFC], perfluorocarbons [PFC], and sulfur hexafluoride [SF_6])and those listed under the Montreal Protocol and its Amendments[2] (chlorofluorocarbons [CFC], hydrochlorofluorocarbons [HCFC], and halons). Table 5.15-1 lists a selection of some of the GHG and their relative global warming potentials (GWP) compared to CO_2. Although not included in this table, water vapor (H_2O) is the strongest GHG, but is also the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant in the atmosphere (IPCC 2001). The major GHG are briefly described below the table.

Table 5.15-1
Greenhouse Gases and Their Relative Global Warming Potential Compared to CO_2

GHG	Atmospheric Lifetime (years)	Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	1
Methane (CH_4)[2]	12 (±3)	21
Nitrous Oxide (N_2O)	120	310
Hydrofluorocarbons:		
HFC-23	264	11,700
HFC-32	5.6	650
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
Perfluoromethane: CF_4	50,000	6,500
Perfluoroethane: C_2F_6	10,000	9,200
Perfluorobutane: C_4F_{10}	2,600	7,000
Perfluoro-2-methylpentane: C_6F_{14}	3,200	7,400
Sulfur Hexafluoride (SF_6)	3,200	23,900

Source: USEPA
1 Based on 100-Year Time Horizon of the Global Warming Potential (GWP) of the air pollutant relative to CO_2.
2 The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Carbon dioxide (CO_2) enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is also removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

Methane (CH_4) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

Nitrous oxide (N_2O) is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

[1] Kyoto Protocol: Established by the United Nations Framework Convention on Climate Change (UNFCC) and signed by more than 160 countries ~~(excluding the United States)~~ countries (including the United States, which ultimately did not ratify) stating that they commit to reduce their GHG emissions by 55 percent or engage in emissions trading.

[2] Montreal Protocol and Amendments: International Treaty signed in 1987 and subsequently amended in 1990 and 1992. Stipulates that the production and consumption of compounds that deplete ozone in the stratosphere (CFC, halons, carbon tetrachloride, and methyl chloroform) are to be phased out by 2000 (2005 for methyl chloroform).

Fluorinated gases are synthetic, strong greenhouse gases that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes called to as High Global Warming Potential gases.

- *Chlorofluorocarbons (CFCs)* are greenhouse gases covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

- *Perfluorocarbons (PFCs)* are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are also used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.

- *Sulfur Hexafluoride (SF_6)* is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF_6 is a strong greenhouse gas used primarily in electrical transmission and distribution systems as an insulator.

- *Hydrochlorofluorocarbons (HCFCs)* contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also greenhouse gases.

- *Hydrofluorocarbons (HFCs)* contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong greenhouse gases (USEPA 2008a).

California's GHG Sources and Relative Contribution

California is the second largest emitter of GHG in the United States, only surpassed by Texas, and the tenth largest GHG emitter in the world (CEC 2005). However, because of more stringent air emission regulations, in 2001 California ranked fourth lowest in carbon emissions per capita and fifth lowest among states in CO_2 emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services). In 2004, California produced 492 million metric tons (MTons) of CO_2-equivalent (CO_{2e}) GHG emissions,[3] of which 81 percent were CO_2 from the combustion of fossil fuels, 2.8 percent were from other sources of CO_2, 5.7 percent were from methane, and 6.8 percent were from N_2O. The remaining 2.9 percent of GHG emissions were from High Global Warming Potential gases, which include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (CEC 2006).

CO_2 emissions from human activities make up 84 percent of the total GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 40.7 percent of the state's total emissions. Electricity consumption is the second largest source, comprising 22.2 percent. While out-of-state electricity generation comprises 22 to 32 percent of California's total electricity supply, it contributes 39 to 57 percent of the GHG emissions associated with electricity consumption in the state. Industrial activities are California's third largest source of GHG emissions, comprising 20.5 percent of state's total emissions. Other major sources of GHG emissions include mineral production, waste combustion and land use, and forestry changes. Agriculture, forestry, commercial, and residential activities comprise the balance of California's greenhouse gas emissions (CEC 2006).

[3] CO2-equivalence is used to show the relative potential that different GHG have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

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Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHG in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and climate change pollutants that are attributable to human activities. The amount of CO_2 has increased by more than 35 percent since preindustrial times, and has increased at an average rate of 1.4 parts per million (ppm) per year since 1960, mainly due to combustion of fossil fuels and deforestation (IPCC 2007). These recent changes in climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants (CAT 2006).

Climate-change scenarios are affected by varying degrees of uncertainty (IPCC 2007). The Intergovernmental Panel on Climate Change's (IPCC) *2007 IPCC Fourth Assessment Report* projects that the range of global mean temperature increase from 1990 to 2100, under different climate-change scenarios, will range from 1.4 to 5.8 °C (2.5 to 10.4°F). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic timeframe but within a human lifetime.

Potential Climate Change Impacts for California

Climate change is not a local environmental impact; it is a global impact. Unlike criteria pollutants, CO_2 emissions cannot be attributed to a direct health effect. However, human-caused increases in GHG have been shown to be highly correlated with increases in the surface and ocean temperatures on Earth (IPCC 2007). What is not clear is the extent of the impact on environmental systems.

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are also hard to predict. Likewise, there are varying degrees of uncertainty in environmental impact scenarios. Because of this uncertainty, the IPCC uses five different confidence levels to quantify climate change impacts on the environment: Very High Confidence (95 percent or greater), High Confidence (67 to 95 percent), Medium Confidence (33 to 67 percent), Low Confidence (5 to 33 percent), and Very Low Confidence (5 percent or less).

In California and western North America, 1) observations in the climate have showed a trend toward warmer winter and spring temperatures, 2) a smaller fraction of precipitation is falling as snow, 3) there is a decrease in the amount of spring snow accumulation in the lower and middle elevation mountain zones, 4) there is an advance snowmelt of 5 to 30 days earlier in the springs, and 5) there is a similar shift (5 to 30 days earlier) in the timing of spring flower blooms (CAT 2006). According to the California Climate Action Team (CAT), even if actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.15-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are now unavoidable.

CAT and the California Environmental Protection Agency (Cal/EPA) use the results from the recent analysis of global climate change impacts for California under three IPCC scenarios: lower emissions (B1), medium-high emissions (A2), and high emissions (A1F1); each is associated with an increasing rise in average global surface temperatures. According to the California Energy Commission (CEC) in their 2006 report, *Our Changing Climate, Assessing the Risks to California*, global climate change risks to California include public health impacts (poor air quality made worse and more severe heat), water resources impacts (decreasing Sierra Nevada snow pack, challenges in securing adequate water supply, potential reduction in hydropower, and loss of winter recreation), agricultural impacts (increasing temperatures, increasing threats from pests and pathogens, expanded ranges of agricultural weeds, and declining productivity), coast sea level impacts (rising coastal sea levels, increasing coastal floods, and shrinking beaches), forest and biological resource impacts (increasing wildfires, increasing threats from pest and pathogens, declining forest productivity, and shifting vegetation and species distribution), and electricity impacts (increased energy demand).

Regulatory Setting

Regulation of GHG Emissions on a National Level

Currently there are no adopted regulations to combat global climate change on a national level. However, recent statutory authority has been granted to the United States Environmental Protection Agency (USEPA) that may change the voluntary approach taken under our current administration to address this issue. On April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the Federal Clean Air Act. Consequently, the regulation of GHG emissions by the USEPA with regard to global climate change on a national level is forthcoming.

After a thorough examination of the scientific evidence and careful consideration of public comments, the USEPA announced on December 7, 2009 that GHG emissions threaten the public health and welfare of the American people. USEPA also finds that GHG emissions from on-road vehicles contribute to that threat. USEPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but rather allow USEPA to finalize the GHG standards proposed earlier this year for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation.

USEPA's endangerment finding covers emissions of six key greenhouse gases – carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride – that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world.

Regulation of GHG Emissions on a State Level

Assembly Bill 32 (AB 32), the Global Warming Solutions Act, was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG. AB 32 follows the first tier of emissions reduction targets established in Executive Order S-3-05, signed on June 1, 2005. Executive Order S-3-05 requires the state's global warming emissions to be reduced to 1990 levels by the year 2020 and by 80 percent of 1990 levels by year 2050. AB 32 sets a 2020 target at the emissions levels that were generated in the state in year 1990. Projected GHG emissions in California are estimated at 596 million MTons of CO_{2e} by 2020. In December 2007, CARB approved a 2020 emissions limit of 427 million MTons (471 million tons) of CO_{2e} for the state. The 2020 target requires emissions reductions of 169 million MTons, approximately 30 percent of the projected emissions compared to business-as-usual (BAU) in year 2020 (i.e., 30 percent of 596 MTons). CARB defines BAU in their Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as is typical practice in 2002-2004.

In order to effectively implement the cap, AB 32 directed CARB to establish a mandatory reporting system to track and monitor global warming emissions levels for large stationary sources that generate more than 25,000 MTons per year, prepare a plan demonstrating how the 2020 deadline can be met, and develop appropriate regulations and programs to implement the plan by 2012. The Climate Action Registry Reporting Online Tool was established through the Climate Action Registry to track GHG emissions. In June 2008, California Air Resources Board (CARB) released a draft of the *Climate Change Scoping Plan,* which was revised in October 2008. The final Scoping Plan was adopted by CARB on December 11, 2008. Key elements of CARB's GHG reduction plan are:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a mix of 33 percent for energy generation from renewable sources;

- Developing a California cap-and-trade program that links with other Western Climate Initiate partner programs to create a regional market system for large stationary sources;

- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- Creating target fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation.

Table 5.15-2 shows the proposed reductions from regulations and programs outlined in the Scoping Plan. While local government operations were not accounted for in achieving the 2020 emissions reduction, CARB estimates that land use changes implemented by local governments that integrate jobs, housing, and services are estimated to result in a reduction of 5 million metric tons of CO_{2e}, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role local governments will play in successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target. Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth over development in greenfields, resulting in fewer vehicle miles traveled. According to the supplement to Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO_{2e} (or approximately 1.2 percent of the GHG reduction target).

Table 5.15-2
Scoping Plan Greenhouse Gas Reduction Measures and Reductions toward 2020 Target

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 MMT CO_{2e}	Percentage of Statewide 2020 Target
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets[1]	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
Total Cap and Trade Program Reductions	**146.7**	**87%**
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
Total Uncapped Sources/Sectors Reductions	**27.3**	**16%**
Total Reductions Counted Towards 2020 Target	**174**	**100%**
Other Recommended Measures – Not Counted Towards 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations	To Be Determined	NA
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
Total Other Recommended Measures – Not Counted Towards 2020 Target	**42.8**	**NA**

Source: CARB 2008. Note: the percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 MMTons and the Scoping Plan identifies 174 MMTons of emissions reductions strategies.
$MMTCO_{2e}$: million metric tons of CO_{2e}
[1] Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.
[2] According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO_{2e} (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 target.

In addition to the requirements under AB 32 to address GHG emission and global climate change in general plans and CEQA documents, Senate Bill 97 (Chapter 185, 2007) requires the Governor's Office of Planning and Research (OPR) to develop CEQA guidelines for addressing global warming emissions and mitigating project-generated GHG. OPR transmitted these guidelines to the Natural Resources Agency. The Natural Resources Agency has begun the rulemaking process and will adopt the CEQA guidelines by January 1, 2010.

In summary, current State of California guidance and goals for reductions in GHG emissions are generally embodied in AB-32 and Executive Order S-01-07. AB 32 establishes a goal of reaching 1990 levels by 2020 and describes a process for achieving that goal. Executive Order S- 03-05 sets a goal for the following for reduction of GHG emissions:

- 2000 levels by 2010

- 1990 levels by 2020
- 80 percent below 1990 levels by 2050.

Regulation of GHG Emissions on a Regional Level

In 2008, Senate Bill 375 (SB 375) was adopted to connect the GHG emissions reductions targets established in the Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce vehicle miles traveled and vehicle trips. Specifically, SB 375 requires CARB to establish GHG emissions reduction targets for each of the 17 regions in California managed by a Metropolitan Planning Organization (MPO). The Southern California Association of Governments (SCAG) is the MPO for the southern California region, which includes the counties of Los Angeles, Orange, San Bernardino County, Riverside, Ventura, and Imperial.

The GHG emissions reduction targets for each region are required to be established no later than September 30, 2010. Once the GHG emissions reduction targets for each region have been established, SB 375 requires the MPOs to prepare a Sustainable Communities Strategy (SCS) in their Regional Transportation Plan. While there is no deadline for adoption of the SCS, it is anticipated that the first plans would not be released until 2011, at the earliest. The SCS sets forth a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide individual jurisdictions with growth strategies that, when taken together, achieve the regional GHG emissions reduction targets. However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS but provides incentives for consistency for governments and developers. If the SCS is unable to achieve the regional GHG emissions reduction targets, than the MPO is required to prepare an Alternative Planning Strategy that shows how the GHG emissions reduction target could be achieved through alternative development patterns, infrastructure, and/or transportation measures.

Existing Irvine Business Complex Emissions Inventory

An existing emissions inventory of the IBC was based on the existing land uses and is shown in Table 5.15-3. Lifecycle emissions are not included in this analysis because no information is available for the proposed project and therefore lifecycle GHG emissions would be speculative. Air quality modeling and details on the modeling assumptions are included as Appendix P. As shown in this table, the majority of GHG emissions generated within the IBC Vision Plan area are associated with transportation sources. Nontransportation emissions from buildings and associated direct sources of emissions represent a much smaller proportion of the IBC Vision Plan area's GHG emissions inventory; however, the City has more of an ability to control emissions from these emission sources.

Table 5.15-3
2008 GHG Emissions Inventory for the Irvine Business Complex

Source	CO_{2e} Emission in MTons/Year	Percent of Total Inventory
Transportation Sector		
Transportation	683,499	75%
Nontransportation Sectors		
Residential	13,957	2%
Non-Residential	159,742	18%
Hotel	6,410	1%
Infrastructure	7,229	1%
Water	3,319	<1%
Solid Waste	35,196	4%
Subtotal Nontransportation Sectors	225,853	25%
Total CO_{2e} Inventory	909,352	100%

Source: CTG 2009
MTons = metric tons
MMTons = million metric tons

5.15.2 Thresholds of Significance

The amendments to the CEQA guidelines were adopted December 30, 2009 ~~are currently in the process of being updated~~ to address ~~global warming~~ GHG emissions. The changes were approved by the Office of Administrative Law for inclusion in California Code of Regulations. The changes become effective March 1, 2010. ~~Pursuant to SB 97, proposed changes to the CEQA Guidelines will be adopted on or before January 1, 2010. The Natural Resources Agency has circulated the proposed changes to the CEQA Guidelines as part of the rulemaking process.~~ Based on ~~the draft~~ these adopted thresholds for GHG emissions, a significant impact relative to global climate change is considered to occur if the project would:

GCC-1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

GCC-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Governor's Office of Planning and Research – SB 97

OPR released a Technical Advisory for addressing climate change through CEQA in June 2008. In their guidance document, OPR recommends that each public agency develop its own consistent approach to performing a climate change analysis based on best available information. OPR states that compliance with CEQA for global climate change analyses entails three basic steps: 1) identify and quantify GHG emissions associated with vehicular traffic, energy consumption, water usage, and construction activities; 2) assess the significance of the impact on climate change; and 3) if the impact is found to be significant, identify alternatives and/or mitigation measures that will reduce the impact below significance. For projects where GHG emissions are considered significant, the California Attorney General has prepared a fact sheet listing various mitigation measures to reduce the project's contribution to global climate change impacts.

California Air Resources Board

On October 24, 2008, CARB released the first preliminary draft recommended approaches for setting interim significance thresholds for GHG under CEQA. The draft approach seeks to establish GHG thresholds and/or performance standards based on sector types, as defined in the adopted Scoping Plan. Sectors identified in the Scoping

Plan are Transportation, Electricity, Industrial, Commercial and Residential, Agricultural, High Global Warming Potential, and Recycling and Waste.

California Air Pollution Control Officers Association

In their January 2008 CEQA and Climate Change white paper, the California Air Pollution Control Officers Association (CAPCOA) identified a number of potential approaches for determining the significance of GHG emissions in CEQA documents. In this white paper, CAPCOA suggests making significance determinations on a case-by-case basis when no significance thresholds have been adopted.

South Coast Air Quality Management District

The issue of global climate change is, by definition, a cumulative environmental impact. In accordance with the South Coast Air Quality Management District (SCAQMD) methodology, any project that produces a significant regional air quality impact in an area adds to the cumulative impact. The SCAQMD is the local air district responsible for establishing thresholds for air quality in the South Coast Air Basin. To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, the SCAQMD has convened a GHG CEQA Significance Threshold Working Group. Currently the SCAQMD is in the process of establishing a threshold for GHG emissions to determine the project's regional contribution toward global climate change impacts for California.[4] On December 5, 2008, the SCAQMD adopted a threshold of 10,000 metric tons (MTons) of CO_{2e} for industrial projects for which they are designated the lead agency for under CEQA.

City of Irvine

The City of Irvine is in the process of preparing the Irvine Climate Action Plan. The City's Climate Action Plan is the City's roadmap to support the state's transition from business-as-usual (BAU) growth and development practices to a clean, low-carbon economy. The City's proposed Climate Action Plan includes the City's 2006 baseline inventory, a project of GHG emissions for year 2020 (BAU scenario), and a target to reduce GHG emissions to by 2020. The Climate Action Plan also identifies strategies for achieving this target, with an emphasis on improving transportation modes and systems, incorporating energy efficiency standards, increasing the City's renewable energy supply portfolio, and devising adaptation measures.

The City's proposed Climate Action Plan proposes a GHG emissions reduction target of 15 percent below the City's existing GHG emissions inventory (2006). This GHG emissions reduction target for the City is based on CARB's Scoping Plan. As stated previously, CARB's Scoping Plan identifies that local governments' GHG emissions would need to be reduced by approximately 15 percent below existing levels in order to achieve the 2020 GHG emissions reduction target of 427 MMTons. While the City's proposed Climate Action establishes a city-wide goal to achieve the reduction targets of AB 32, the CEQA Guidelines (updated December 2009) requires a lead agency to evaluate the change in existing physical environmental conditions associated with the project. In accordance with CEQA Guidelines a net zero increase in GHG emissions would clearly indicate that no significant impacts would occur as Section 15064.4(b)(1) is not intended to imply a zero net emissions threshold of significance (Natural Resources Agency 2009). Therefore, GHG emissions associated with the IBC Vision Plan are compared to ~~the City's GHG reduction target of 15 percent below~~ existing levels for transportation and nontransportation sources. The City separates emissions into these two categories because transportation emissions are indirect emissions that are regulated through federal, statewide, and regional emissions reduction programs; whereas, nontransportation sectors can be directly controlled by applicants for new projects or the City.

[4] http://www.aqmd.gov/ceqa/handbook/GHG/GHG.html.

To achieve this target, plans, programs, or policies (PPP) and project design features (PDF) would need to achieve ~~a 15 percent reduction~~ attain a net zero increase in GHG emissions. If PPPs and PDFs, identified by the project do not achieve ~~15 percent below~~ the IBC Vision Plan's current GHG emissions inventory, then GHG emissions impacts will be considered potentially significant in the absence of mitigation. Table 5.15-4 shows the GHG emissions reduction targets based on the existing emissions inventory for the IBC shown in Table 5.15-3. The GHG reduction target for the IBC Vision Plan area for transportation emissions is ~~580,974~~ 683,499 MTons ~~(i.e., 15 percent below current existing conditions)~~ and the target ~~fro~~ for nontransportation emissions is ~~191,975~~ 225,853 MTons ~~(i.e., 15 percent below existing conditions)~~.

Table 5.15-4
IBC Vision Plan Transportation and Nontransportation GHG Reduction Targets

Source	~~Existing CO_{2e} Emissions~~ GHG Reduction Target	~~15 Percent below Existing Conditions GHG Reduction Target~~
Transportation Sector	683,499 MTons	~~580,974 MTons~~
Nontransportation Sectors	225,853 MTons	~~191,975 MTons~~

Source: CTG 2009
MTons = metric tons

5.15.3 Environmental Impacts

Modeling Methodology

GHG emissions calculated for the IBC Vision Plan are based on a subset of the GHG inventory calculated for the Draft Irvine Climate Action Plan (CAP). The Draft Irvine CAP incorporates information from Irvine's Energy Plan as well as preliminary GHG inventory work performed by ICLEI – Local Governments for Sustainability. The GHG emissions inventory for the IBC Vision Plan includes both direct and indirect emissions sources. Direct emissions are those resulting from the on-site combustion of fossil fuels (e.g., natural gas, propane, gasoline, and diesel). Indirect emissions include off-site emissions associated with purchased electricity or purchased steam, as well as other emissions sources, such as third-party vehicles and the embodied energy. The inventory includes the following emission sources:

- Building operations: emissions associated with space heating and cooling, water heating, and lighting
- Transportation: emissions associated with residential, service and commercial vehicles, and transit
- Construction: emissions associated with site preparation, excavation, grading, and construction-related vehicular activity (construction-related solid waste removal)
- Water: emissions associated with energy used to pump, convey, treat, deliver, and re-treat water (embodied energy of water)
- Solid waste: emissions associated with residential and commercial waste streams (embodied energy of materials)

In an effort to more accurately articulate and capture these emissions into Irvine's GHG inventory, the ICLEI inventory was built upon and expanded to include more refined information on actual energy use for residential, non-residential, and infrastructure elements. Energy use was provided by Southern California Edison (SCE) and Southern California Gas (SoCal) according to utility customer rate schedules. In addition to actual energy use, water use was provided by the Irvine Ranch Water District (IRWD). The City's ITAM transportation model was used to refine calculations on vehicle miles traveled (VMT) compared to the ICLEI inventory approach, which uses the Caltrans's Highway Performance Monitoring System.

GLOBAL CLIMATE CHANGE

The California and federal governments have established a number of mandates that will reduce GHG emissions by 2030. Three of the most important quantifiable factors include California's statewide Renewable Portfolio Standard (RPS), California's Low Carbon Fuel Standard (LCFS), the federal CAFE fuel economy standards, and Title 24 Code Cycles. In addition, implementation of existing Citywide PPPs and PDFs reduce GHG emissions associated with the project.

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies (PPPs) that apply to the proposed project and will help to reduce and avoid potential impacts related to global climate change. The PPPs have been separated between Citywide strategies and Statewide and Federal strategies for the Global Climate Change Section.

Citywide Construction Strategies

PPP 15-1 **City of Irvine Construction and Demolition (C&D) Debris Recycling and Reuse Ordinance:** The C&D ordinance requires that 1) all residential projects of more than one unit, 2) nonresidential developments on 5,000 square feet or larger, and 3) nonresidential demolition/renovations with more than 10,000 square feet of building recycle or reuse a minimum of 75 percent of concrete and asphalt and 50 percent of nonhazardous debris generated.

Statewide and Federal Operational Strategies

PPP 15-2 **2008 Building and Energy Efficiency Standards (CCR Title 24):** Prior to the issuance of a building permit for residential, commercial, or office structures in the Irvine Business Complex, development plans for these structures shall be required to demonstrate that the project meets the 2008 Building and Energy Efficiency Standards. Commonly known as Title 24, these standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2008 standards are approximately 15 percent more energy efficient than the 2005 Building and Energy Efficiency Standards. Plans submitted for building permits shall include written notes demonstrating compliance with the 2008 energy standards and shall be reviewed and approved by the Public Utilities Department prior to issuance of building permits. Design strategies to meet this standard may include maximizing solar orientation for daylighting and passive heating/cooling, installing appropriate shading devices and landscaping, utilizing natural ventilation, and installing cool roofs. Other techniques include installing insulation (high R value) and radiant heat barriers, low-e window glazing, or double-paned windows.

PPP 15-3 **Title 24 Code Cycles: Net-Zero Buildings (Residential & Non-Residential):** The California Public Utilities Commission adopted its Long-Term Energy Efficiency Strategic Plan on September 18, 2008, presenting a roadmap for all new residential and commercial construction to achieve a zero-net energy standard. This Plan outlines the goal of reaching zero net energy in residential construction by 2020 and in commercial construction by 2030. Achieving this goal will require increased stringency in each code cycle of California's Energy Code (Title 24).

PPP 15-4 **California Renewable Portfolio Standard:** CARB's Renewable Portfolio Standard (RPS) is a foundational element of the State's emissions reduction plan. In 2002, Senate Bill 1078 established the California RPS program, requiring 20 percent renewable energy by 2017. In 2006, Senate Bill 107 advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II. On September 15, 2009, Governor Arnold Schwarzenegger signed Executive Order S-21-09 directing CARB to adopt regulations increasing RPS to 33 percent by 2020. These mandates apply directly to investor-owned utilities, in this case Southern California Edison (SCE).

PPP 15-5 **California Low Carbon Fuel Standard:** On January 18, 2007, Governor Arnold Schwarzenegger issued Executive Order S-1-07 requiring the establishment of a Low Carbon Fuel Standard (LCFS) for transportation fuels. This statewide goal requires that California's transportation fuels reduce their carbon intensity by at least 10 percent by 2020. Regulatory proceedings and implementation of the LCFS have been directed to CARB. The LCFS has been identified by CARB as a discrete early action item in the Scoping Plan. CARB expects the LCFS to achieve the minimum 10 percent reduction goal; however, many of the early action items outlined in the Scoping Plan work in tandem with one another. To avoid the potential for double-counting emission reductions associated with AB 1493 (Pavley), the Scoping Plan has modified the aggregate reduction expected from the LCFS to 9.1 percent.

PPP 15-6 **Federal Corporate Average Fuel Economy (CAFE) Standards:** The 2007 Energy Bill creates new federal requirements for increases in fleetwide fuel economy for passenger vehicles and light trucks. The federal legislation requires a fleetwide average of 35 miles per gallon (mpg) to be achieved by 2020. The National Highway Traffic Safety Administration is directed to phase in requirements to achieve this goal. Analysis by CARB suggests that this will require an annual improvement of approximately 3.4 percent between 2008 and 2020.

PPP 15-7 **California Assembly Bill 1493 – Pavley Standards:** On July 22, 2002, Governor Gray Davis signed Assembly Bill 1493 requiring CARB to develop and adopt regulations designed to reduce greenhouse gases emitted by passenger vehicles and light-duty trucks beginning with the 2009 model year. The standards set within the Pavley regulations are expected to reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016. California had petitioned the USEPA in December 2005 to allow these more stringent standards and California executive agencies have repeated their commitment to higher mileage standards. On July 1, 2009, the USEPA granted California a waiver that will enable the state to enforce stricter tailpipe emissions on new motor vehicles.

PPP 15-8 **SB 375:** SB 375 requires the reduction of GHG emissions from light trucks and automobiles through land use and transportation efforts that will reduce vehicle miles traveled (VMT). In essence, SB 375's goal is to control GHGs by curbing urban sprawl and through better land use planning. SB 375 essentially becomes the land use contribution to the GHG reduction requirements of AB 32, California's global warming bill enacted in 2006. The proposed project is consistent with SB 375 strategies to reduce VMT and associated GHG emissions in that it represents a compact, mixed-use development, improves jobs/housing balance in the City and Orange County Council of Governments Subregion, and provides access to mass transit. According to the 2008 Regional Comprehensive Plan, SCAG's Land Use and Housing Action Plan can be expected to result in a 10 percent reduction in VMT in 2035 when compared to current trends.

Citywide Operational Strategies

PPP 15-9 **Transit Service to LAX:** Although the City of Irvine is serviced by John Wayne Airport, Los Angeles International Airport (LAX) is the regional air transportation hub. Providing direct transit service from the City to LAX can reduce single passenger trips to this destination. The Los Angeles World Airports operates three Flyaway shuttles that provide nonstop airport service to and from Westwood, Van Nuys, and Downtown Los Angeles via the Flyaway program. Since November 16, 2009, a Flyaway shuttle from the Irvine Metrolink Station to LAX provides nonstop service. Based on the ITAM model, a 0.25 percent reduction in VMT is achieved through implementation of this program.

PPP 15-10 **Comprehensive Signal Retiming and Coordination Program:** Emissions are highest at the lowest travel speeds. The City is currently retiming and coordinating signals throughout Irvine under its ITEMS (Irvine Traffic Engineering System) program. The City plans to enhance signal coordination in the IBC area by the end of 2011. A program to retime and coordinate traffic signals would produce more even traffic flows, so that vehicles are not staring and stopping constantly. These types of programs can improve vehicular

level of service (LOS), thereby decreasing emissions for the same volume of vehicles. Based on the ITAM model, a 1 percent citywide reduction in VMT is achieved through implementation of this program.

PPP 15-11 **Additional Fixed Route Shuttle System to Complement The *i* Shuttle:** In March 2008, the City introduced **The *i* Shuttle** service, which complements regional bus service and provides direct express transportation to and from the nearby Tustin Metrolink Station, John Wayne Airport, and throughout the IBC. **The *i* Shuttle** currently operates 12 fully accessible, compressed natural gas (CNG) buses and is funded by the City of Irvine and the Orange County Transportation Authority. The City's shuttle system has the potential to further decrease VMT in the City by encouraging employees not living in the IBC to commute to work using mass transit. Fehr & Peers is currently preparing a comprehensive study of additional local shuttles designed to complement the existing fixed route bus service operated by OCTA and the existing **The *i* Shuttle**. This report (Irvine Transit Vision, June 2009) identified six new shuttle routes for within the City of Irvine that would connect from either the Irvine Metrolink Station or the Tustin Metrolink Station to various destinations in Irvine. The City will provide additional shuttle service using the Irvine Transit Vision as a guide.

PPP 15-12 **Energy Efficient Traffic Lights:** New traffic signals installed within the Irvine Business Complex will have light emitting diodes. The City is implementing a program to convert all traffic lights in the City to traffic light emitting diodes.

PPP 15-13 **Waste Reduction:** The City adopted a Zero Waste program in 2007 to approach waste management. The City recovers approximately 66 percent of its waste for recycling and composting, which exceeds the state's AB 939 waste diversion goals. Furthermore, waste haulers establish rate schedules according to bin size and frequency of collection. Commercial customers that subscribe to smaller bins (e.g., 2 cubic-yard bins) are routinely charged less by haulers. This pricing structure encourages waste reduction and recycling, and tends to minimize hauler pickups.

PPP 15-14 **Renewable Energy and Existing Buildings Retrofit Program**: Pursuant to City Council Resolution 09-52, the City has received federal funding from the U.S. Department of Energy to establish a Renewable Energy and Existing Retrofit Program. Retrofitting is designed to improve a building's energy consumption by using cost-effective measures that do not require extensive remodeling work. The City of Irvine is proposing to use the "whole building approach" meaning that the City will look at the following:

- Thermal envelope (i.e. the shell insulation and air leakage)
- Mechanical systems (i.e. HVAC and domestic hot water)
- Appliances and lighting that may need replacing

The approach will evaluate these areas and their interaction given usage rates, building site, and climate to assess the building's overall energy efficiency and performance and to make targeted recommendations for improvement and ultimately reduce residential demand. The City of Irvine will create a financing district to help property owners finance energy efficiency improvements and renewable energy installations. The City of Irvine is forming a Property Assessed Clean Energy (PACE) District under the Mello-Roos Community Facilities Act of 1982 and its powers as a charter city. Eligible improvements may include energy efficiency, water conservation, and renewable energy improvements to privately owned buildings or property. Potential funding for initial improvements may come from various sources including American Recovery and Reinvestment Act grants, taxable bonded indebtedness, other external financing arrangements, or City funds.

PPP 15-15 **Safe Route to Schools:** The Safe Routes to School program is a federal and state grant program intended to increase the percentage of students walking or cycling to school. Funding is awarded to cities to

construct engineering improvements and to start educational, encouragement, and enforcement programs. The City of Irvine has been successful in obtaining grant funding to implement a citywide program that includes walking school buses—groups of students who meet at a designated location and walk to school together, with a parent at the front and back of the group. This encourages students to walk to school and assuages parents' fears of traffic and crime safety risks that are impediments to walking alone. Based on the ITAM model, a 0.2 percent reduction in VMT is achieved through implementation of this program.

PDF 15-16 **Circulation Phasing Analysis:** The amount of emissions increase exponentially as arterial travel speeds decrease. As is the case with many cities in Southern California, there are often defined congestion locations (such as the major intersections along Jamboree Road) where a majority of congestion and delay occurs. The City currently has a Circulation Phasing Analysis program in place. They collect traffic counts at congested locations on a bi-annual basis and monitor locations every three years. The results of the analysis are used to determine future Capital Improvement Projects.

Project Design Features

Many aspects of the project's proposed land uses and design directly and indirectly reduce the project's contribution to cumulative impacts on global climate change. These PDFs are summarized below and their relevance to reduced impacts is described more fully in the impacts analysis that follows.

Construction

PDF 15-1 **Alternate Transportation Incentives:** As described in the proposed zoning for the project, applicants for new developments in the Irvine Business Complex shall require that the construction contractor provide alternative transportation mode incentives such as bus passes and/or carpooling for workers to and from the worksite on days that construction activities require 200 or more workers. These requirements shall be noted on the grading plan cover sheet.

PDF 15-2 **Recycled Materials:** As described in the proposed zoning for the project, applicants for new developments in the Irvine Business Complex shall submit evidence to the satisfaction of the Director of Community Development or the Director of Public Works that the project uses recycled materials for at least 20 percent of construction materials. Recycled materials may include salvaged, reused, and recycled content materials. Recycled and/or salvaged building materials shall be shown on building plans and product cut sheets submitted to the City.

Land Use

PDF 15-3 **Compact/Mixed-Use Development:** The California Energy Commission (CEC) considers compact development forms beneficial for minimizing energy consumption that leads to greenhouse gas emissions. In fact, the CEC's report on the connections between land use and climate change identifies density as the project feature most predictive of the number of vehicle trips and VMT by project occupants. The project locates additional housing opportunities near major employment and transportation centers. On a regional basis, this Land Use PDF will reduce regional VMT.

PDF 15-4 **High Rate of Internal Trip Capture:** With the inclusion of a mix of land uses including office, commercial, industrial, and residential in the project area, the proposed project significantly reduces trips outside the project area. This reduces trip length and congestion on the local circulation system outside the project area.

PDF 15-5 **Office/Commercial Development Heat Island Standards:** New parking lots serving retail and office developments shall include tree plantings designed to result in 50 percent shading of parking lot surface areas within 15 years. These shading requirements shall apply to all impervious surfaces on which a

vehicle can drive, including parking stalls, driveways, and maneuvering areas within parking areas. Commercial developments shall provide landscapes with drought-resistant species and groundcovers, rather than pavement, to reduce heat reflection. Additionally: 1) Buildings are encouraged to be oriented to the south or southwest, where feasible; 2) deciduous trees are encouraged to be planted on the west and south sides of structures.

Transportation

PDF 15-6 **Urban Infill Near Multiple Transit Modes:** The project would develop high-density housing in an area being served by at least two modes of transit. On March 31, 2008, **The *i* Shuttle**, which is operated by the City of Irvine and designed for the IBC community, began operating. The shuttle allows residents and employees to have an alternative way to commute to jobs and locations throughout the IBC. The shuttle offers three routes to accommodate residents and employees traveling within the area and to and from the IBC (see Figure 4-2, *The i Shuttle Route*). Route A connects the Tustin Metrolink Station to the John Wayne Airport via Von Karman Avenue. Route B connects the Tustin Metrolink Station to the heart of the IBC via Jamboree Road and Michelson Drive. Route C is a midday service in the busiest section of the IBC. Therefore, the project would facilitate walking and nonmotor travel to a greater extent than would be the case for similar development in outlying areas without extensive transit availability. In addition, the high-density development would include a greater number of potential residents that could use or engage in alternative modes of travel than in a lower density development on the project site.

PDF 15-7 **Transportation Management Association (TMA):** The City anticipates establishment of a TMA for the IBC by Spring 2010. Based on the ITAM model, establishment of the TMA for the IBC Vision Plan area would result in a reduction of 8 percent of projected VMT. ~~As described in the proposed zoning for the project, future applicants of new commercial, office, and retail development within the Irvine Business Complex area shall provide the following features to reduce project-related mobile-source air pollutant emissions:~~

- ~~Preferential parking for carpools and vanpools totaling 5 percent of all spaces on-site.~~
- ~~Preferential parking for alternative-fuel vehicles (e.g., compressed natural gas or hydrogen) totaling 5 percent of all spaces on-site.~~
- ~~Secure bicycle parking and storage facilities for employees and visitors that can accommodate 15 percent of employees on-site.~~
- ~~Commuter information boards indentifying bicycle paths and public transit routes and schedules.~~

PDF 15-8 **Pedestrian Improvements:** The IBC Vision Plan creates funding mechanisms to provide for the implementation of community-orientated pedestrian infrastructure improvements to increase walkability. New streets incorporated into the IBC would reduce the size of the city blocks to a pedestrian scale and pedestrian paseos would connect to the arterials at key locations. In addition, many of the streets in the IBC currently do not have sidewalks. The sidewalk improvement program would be expanded to provide connectivity, and incorporate several new pedestrian bridges, and many existing sidewalks would be moved away from the curb into the setback area. The Creekwalk system is also envisioned adjacent to the San Diego Creek to provide a trail to connect the Great Park from the IBC and the Civic Center.

PDF 15-9 **Bicycle Improvements:** The IBC would provide linkages to the City regional bicycle trail system. Currently continuous on-street bicycle lanes exist only along Main Street. Bicycle lanes are proposed along parts of Jamboree Road, Red Hill Avenue, Von Karman Avenue, Michelson Avenue, Carlson Avenue, Barranca Parkway, and Alton Parkway. Furthermore, the sidewalk system would be shared between

pedestrians and bicycles. As part of the Vision Plan, bicycle connections to the San Marco Park, adjacent to the San Diego Creek, would be improved with a new pedestrian bridge.

Also refer to PDF 13-1 and PDF 15-7, which ~~require~~ allow for the creation of a Transportation Management Association (TMA) for the IBC area.

~~PDF 15-10 **Safe Route to Schools:** The Safe Routes to School program is a federal and state grant program intended to increase the percentage of students walking or cycling to school. Funding is awarded to cities to construct engineering improvements and to start educational, encouragement, and enforcement programs. The City of Irvine has been successful in obtaining grant funding to implement a citywide program that includes walking school buses – groups of students who meet at a designated location and walk to school together, with a parent at the front and back of the group. This encourages students to walk to school and assuages parents' fears of traffic and crime safety risks that are impediments to walking alone. Based on the ITAM model, a 0.2 percent reduction in VMT is achieved through implementation of this program.~~

~~PDF 15-11 **Circulation Phasing Analysis:** The amount of emissions increase exponentially as arterial travel speeds decrease. As is the case with many cities in Southern California, there are often defined congestion locations (such as the major intersections along Jamboree Road) where a majority of congestion and delay occurs. The City currently has a Circulation Phasing Analysis program in place. They collect traffic counts at congested locations on a bi-annual basis and monitor locations every three years. The results of the analysis are used to determine future Capital Improvement Projects.~~

Water Conservation and Efficiency

PDF 15-10~~12~~ **Ultra-Low-Flow Fixtures:** Applicants for new developments in the Irvine Business Complex shall submit evidence to the satisfaction of the Director of Community Development that toilets, urinals, sinks, showers, and other water fixtures installed on-site are ultra-low-flow water fixtures that exceed the Uniform Plumbing Code. Examples are: 1.28 average gallons per flush high efficiency toilets, 2 gallon per minute (gpm) efficient bathroom faucets, 2.2 gpm efficient kitchen faucets, and 2.2 gpm efficient shower heads.

PDF 15-11~~13~~ **Landscaping and Irrigation Systems:** Applicants for new developments in the Irvine Business Complex shall submit evidence to the satisfaction of the Director of Community Development that landscaping irrigation systems installed in the project are automated, high-efficient irrigation systems that reduce water use, such as an evapotranspiration "smart" weather-based irrigation controller, dual piping for recycled water, and bubbler irrigation; low-angle, low-flow spray heads; moisture sensors; and use of a California-friendly landscape palette. These features will make the project consistent with the intent of the California Water Conservation in Landscaping Act of 2006 (AB 1881), including provisions to reduce the wasteful, uneconomic, inefficient, and unnecessary consumption of water.

PDF 15-12~~14~~ **Use of Reclaimed Water on All Master Landscaped Areas:** If recycled water service is determined by IRWD to be feasible (see PPP 14-1), applicants for new developments in the Irvine Business Complex shall use reclaimed water in all master landscaped areas. This will include master landscaped commercial, multifamily, common, roadways, and park areas. Master landscapes will also incorporate weather-based controllers and efficient irrigation system designs to reduce overwatering, combined with the application of a California-friendly landscape palette.

Solid Waste Measures

PDF 15-13~~15~~ **Material Recovery:** To reduce waste generated in the IBC and encourage recycling of solid wastes, the Orange County Integrated Waste Management Department operates material recovery facilities to recycle glass, plastic, cans, junk mail, paper, cardboard, greenwaste (e.g., grass, weeds, leaves, branches, yard

trimmings, and scrap wood), and scrap metal. Future employees, residents, and customers would participate in these programs. On-site recycling facilities will be required for all commercial, retail, industrial, and multifamily residential developments.

Building

PDF 15-14~~16~~ **GreenPoint Rated Residential Buildings:** Applicants for new residential developments in the Irvine Business Complex shall submit evidence to the satisfaction of the Director of Community Development that proposed buildings are designed and constructed to be GreenPoint Rated. GreenPoint Rated developments must achieve a minimum of 50 total points and meet the category-specific point thresholds as specified in the current GreenPoint Rated Builder Handbook. Developments that exceed this minimum are rewarded by a higher grade on their projects. The GreenPoint Rated program is updated every three years to coincide with changes to the California Building Energy Efficiency Standards.

PDF 15-15 ~~17~~ **Designed to Earn the Energy Star Non-Residential Buildings:** Applicants for new non-residential developments in the Irvine Business Complex shall submit evidence to the satisfaction of the Director of Community Development that proposed buildings are designed and constructed to achieve the 'Designed to Earn the Energy Star' rating. In order achieve the 'Designed to Earn the Energy Star' rating, the architect/design firm must demonstrate that the final estimate of the building's energy use corresponds to a rating of 75 or better using the US EPA's Energy Performance Rating from the Internet-based tool, Target Finder.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.15-1: PROJECT-RELATED GREENHOUSE GAS EMISSIONS COULD SIGNIFICANTLY CONTRIBUTE TO GLOBAL CLIMATE CHANGE IMPACTS OR CONFLICT WITH THE CALIFORNIA AIR RESOURCES BOARD–ADOPTED SCOPING PLAN. [THRESHOLD GCC-1 AND GCC-2]

Impact Analysis: Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact. The State of California, through its governor and its legislature, has established a comprehensive framework for the substantial reduction of GHG emissions over the next 40+ years. This will occur primarily through the implementation of AB 32, Executive Order S-3-05, and SB 375, which address GHG emissions on a statewide cumulative basis.

Impact of Changing Climatic Conditions

Potential implications of climate change for the proposed project based on the IPCC's 2100 scenarios include sea level rise, temperature, precipitation, wildfires, and water supply reliability:

Temperature Increase. Rising temperatures could have a variety of impacts, including stress on sensitive populations (e.g., sick and elderly), additional burden on building systems (e.g., demand for conditioning), and, indirectly, increasing emissions of greenhouse gases and criteria pollutants associated with energy generation. It is not possible to reliably quantify these risks at this time.

Sea Level Rise. Rising sea levels are unlikely to directly impact the IBC Vision Plan area due to its distance from the coast and relative elevation.

Precipitation. Climate change is expected to alter seasonal and inter-annual patterns of precipitation. These changes continue to be one of the most uncertain aspects of future scenarios. For this project, the most relevant direct impacts are likely to be changes in the timing and volume of stormwater runoff and changes in demand for irrigation. It is not possible to reliably quantify the implications of these changes at this time.

Wildfire. Changes in temperature and precipitation may combine to alter risks of wildfire. Changes in wildfire hazard have the potential to impact the IBC Vision Plan area; however, it is not possible to reliably quantify the implications of these changes at this time.

Water Supply Reliability. Changes in temperature and precipitation may also influence seasonal and inter-annual availability of water supplies. Consequently, it is reasonable to consider that climate change may affect water supply reliability. It is not possible to reliably quantify these risks for the IBC Vision Plan at this time.

Project-Related GHG Emissions

OPR recommends that projects identify and quantify GHG emissions, assess the significance of the impact on climate change, and, if it is determined to be significant, identify alternatives and/or mitigation measure that would reduce the impact. Annual CO_{2e} emissions for construction and operation of the project are evaluated for the potential to interfere with the State of California's ability to achieve its GHG reduction goals and strategies, as identified in AB 32. The approach employed is that the affects of a proposed project may not be evaluated based on the quantity of GHG emissions, but rather on whether practicable available control measures are implemented. If the proposed project implements GHG emissions reduction strategies that achieve a 15 percent reduction from existing conditions, it could reasonably follow that the project would not result in a significant contribution to the cumulative impact of global climate change.

CO_{2e} emissions from construction and operational activities associated with the ~~existing conditions,~~ ~~and~~ post-2030 (P2030) Proposed General Plan BAU and P2030 Proposed General Plan with Statewide and Federal PPPs and PDFs are shown in Table 5.15-5. Information regarding specific development projects would be needed in order to quantify the level of impact associated with construction activities. However, an annual average construction emissions estimate is included in the emissions inventory. In general, project-related transportation emissions continue to represent the largest proportion of emissions associated with the project (68 percent). While development patterns can influence travel behavior and travel modes, these emissions are indirect sources of GHG emissions that are not directly controlled by applicants for new development projects in the IBC. The second largest source of emissions is from emissions generated by nonresidential buildings (i.e., energy use for heating and cooling, etc.) followed by emissions associated with residential buildings and waste. Direct sources of emissions from residential and nonresidential buildings can be controlled by new development by ensuring that structures are built efficiently to reduce demand on energy use and that nonpotable/recycled water is used where available to reduce demand of potable water use.

Table 5.15-5
Post-2030 Annual GHG BAU Emissions Inventory for the Irvine Business Complex

Source	Proposed General Plan BAU (P2030)	Percent of Total Proposed General Plan P2030 BAU Inventory	Proposed General Plan P2030 with Statewide and Federal PPPs and PDFs
Transportation Sector			
Transportation	872,087	68%	~~512,956~~ 615,694[1]
Transportation GHG Reductions Needed	**~~291,113~~ 683,499**	—	— 67,805 MTons
Nontransportation Sectors			
Residential	122,788	10%	~~47,359~~ 53,832[2, 3]
Non-Residential	191,254	15%	~~97,791~~ 113,390[3, 4]
Hotel	7,996	1%	~~3,988~~ 4,641[3]
Infrastructure	8,314	1%	7,898
Water	5,497	0%	~~4,394~~ 5,224[3]
Solid Waste	48,953	4%	~~44,064~~ 48,953[3]
Construction	32,072	2%	32,072
Subtotal	416,874	32%	~~237,566~~ 266,010
Nontransportation GHG Reductions Needed	**~~224,889~~ — 225,853**	—	— 40,157 MTons
Total CO_{2e} Inventory	**1,288,961**	**100%**	**~~750,522~~ 881,704**
TOTAL CITYWIDE REDUCTIONS NEEDED	—	—	**40,157 MTons**

Source: CTG 2009
MTons = metric tons
[1] Includes 78,494 MTons of reductions associated with the California Low Carbon Fuel Standard (PPP 15-5) and 177,900 MTons associated with the Federal Corporate Average Fuel Economy (CAFE) Standards (PPP 15-6).
[2] Includes 60,180 MTons of residential reductions associated with the Title 24 Code Cycles: Net Zero Buildings (PPP 15-3).
[3] Includes a total of 16,792 MTons of reductions associated with the California Renewable Portfolio Standard (PPP 15-4) for residential, non-residential, hotel, water, and solid waste.
[4] Includes 73,892 MTons of non-residential reductions associated with the Title 24 Code Cycles: Net Zero Buildings (PPP 15-3).

The IBC Vision Plan does not consider design features in isolation, and the project includes an integrated set of emissions reducing features addressing each land use. The IBC Vision Plan also sets a series of Citywide PPPs and PDFs that can guide design, construction, and operational practices throughout the life of the IBC Vision Plan. However, the IBC Vision Plan also explicitly recognizes that the energy-related technologies are changing quickly. Consequently, it is necessary and prudent to provide flexibility to select the most cost-effective options available to meet emissions reduction targets when each phase of development actually takes place. This flexible approach is consistent with the recommendations of the Attorney General, aspirations expressed by the Governor, and AB 32.

The City's GHG reduction target is ~~15 percent below~~ existing levels, or no net increase in GHG emissions, for transportation and nontransportation sectors. To achieve this target, Citywide PPP and PDFs would need to achieve ~~a 15 percent reduction from existing conditions (see Table 5.15-4). Because the Proposed General Plan BAU (P2030) scenario generates 1,288,960 MTons of GHG emissions, PPPs and PDFs would need to achieve 291,113 MTons of reductions from P2030 for transportation sources and 224,899~~ 40,157 MTons of reductions from P2030 for nontransportation sources. Federal and State strategies would achieve the City's target of a zero net increase for transportation-related GHG emissions. However, additional reductions associated with Federal and Statewide transportation strategies are not applied as offsets toward the non-transportation sources. Therefore, Citywide PPPs and PDFs would need to achieve a total of 40,157 MTons of reductions in order to meet the City's zero net increase in GHG emissions threshold for transportation and non-transportation sources combined. Table 5.15-6 below quantifies reductions associated with Citywide PPPs and PDFs.

As shown in this table, Citywide PPPs and PDFs achieve 131,182 MTons of GHG reductions and therefore would ~~not~~ achieve the GHG emissions reduction target for the IBC Vision Plan area. Consequently, ~~mitigation measures are required to ensure GHG emissions achieve the GHG emissions reduction target for the IBC Vision Plan. The~~ the project's contribution to GHG impacts are considered ~~potentially~~ less than significant.

~~*Table 5.15-6*~~
~~*GHG Reductions Associated with PPPs and PDFs*~~

~~**PPP/PDF**~~	~~**Action**~~	~~**GHG Emissions Reductions from Proposed General Plan BAU (P2030) in MTons of CO_{2e}**~~
~~**Transportation**~~		
~~**Citywide PPPs and PDFs**~~		
~~PDF 15-10~~	~~Safe Route to Schools~~	~~1,747~~
~~PPP 15-9~~	~~Transit Service to LAX~~	~~2,174~~
~~PPP 15-11~~	~~Additional Fixed Route Shuttle System to Complement **The** / **Shuttle**~~	~~8,723~~
~~PDF 15-7~~	~~Transportation Management Association (TMA)[1]~~	~~72,648[1]~~
~~PPP 15-10~~	~~Comprehensive Signal Retiming and Coordination Program~~	~~8,723~~
~~PDF 15-11~~	~~Circulation Phasing Analysis~~	~~8,723~~
	~~**Subtotal Citywide PPPs and PDFs**~~	~~102,738 MTons~~
~~**Statewide and Federal PPPs**~~		
~~PPP 15-5~~	~~California Low Carbon Fuel Standard~~	~~78,493~~
~~PPP 15-6~~	~~Federal Corporate Average Fuel Economy (CAFE) Standards~~	~~177,900~~
	~~**Subtotal Statewide and Federal PPPs**~~	~~256,363 MTons~~
~~**Transportation Reductions from Post-2030 BAU**~~		~~**359,131 MTons**~~
~~Transportation Target for Post-2030~~		~~291,113 MTons~~
~~Achieves Transportation GHG Target?~~		~~Yes~~
~~**Nontransportation**~~		~~**30,618 MTons**~~
~~**Citywide PPPs and PDFs**~~		
~~PDF 15-16~~	~~Residential Buildings: GreenPoint Rated Residential Buildings~~	~~7,303~~
~~PDF 15-17~~	~~Non-Residential Buildings Designed to Earn the Energy Star~~	~~16,252[2]~~
~~PPP 15-1 and PPP 15-13~~	~~Solid Waste: C&D Debris Recycling and Reuse Ordinance and Waste Reduction~~	~~4,889~~
	~~**Subtotal Citywide PPPs and PDFs**~~	~~28,444 MTons~~
~~**Statewide and Federal PPPs**~~		
~~PPP 15-4~~	~~California Renewable Portfolio Standard~~	~~16,792~~
~~PPP 15-3~~	~~Title 24 Code Cycles: Net-Zero Buildings~~ ~~Residential~~ ~~Non-Residential~~	 ~~60,180~~ ~~73,892~~
	~~**Subtotal Statewide and Federal PPPs**~~	~~150,864 MTons~~
~~**Nontransportation Reductions from Post-2030 BAU**~~		~~**179,308 MTons**~~
~~Nontransportation Target for Post-2030~~		~~224,899 MTons~~
~~Achieves Nontransportation GHG Target?~~		~~**No**~~

~~Source: CTG 2009.~~
~~Notes:~~
~~[1] Includes requirements for bicycle lockers and on-site showers and parking spaces for carpools.[5]~~
~~[2] Does not include 2,174 MTons of reductions associated with preferred parking for carpools and vanpools.~~

~~[1] Approximately 2,174 MTons of GHG emissions reductions from preferential parking for carpools and vanpools (PDF 15-7) was included as part of the non-residential buildings strategy. Also includes 704 MTons from secure bicycle parking and storage facilities for employees and visitors (PDF 15-7).~~

Table 5.15-6
GHG Reductions Associated with Citywide PPPs and PDFs

Citywide PPP/PDF	Action	GHG Emissions Reductions from in MTons of CO_{2e}
PDF 15-10	Safe Route to Schools	1,747
PPP 15-9	Transit Service to LAX	2,174
PPP 15-11	Additional Fixed Route Shuttle System to Complement **The *i* Shuttle**	8,723
PDF 15-7	Transportation Management Association (TMA)[1]	72,648[1]
PPP 15-10	Comprehensive Signal Retiming and Coordination Program	8,723
PDF 15-11	Circulation Phasing Analysis	8,723
PDF 15-16	Residential Buildings: GreenPoint Rated Residential Buildings	7,303
PDF 15-17	Non-Residential Buildings Designed to Earn the Energy Star	16,252[2]
PPP 15-1 and PPP 15-13	Solid Waste: C&D Debris Recycling and Reuse Ordinance and Waste Reduction	4,889
Total Citywide PPP and PDF Reductions		131,182 MTons
GHG Reduction Target for Post 2030		40,157 MTons
Achieves GHG Reduction Target		Yes

Source. CTG 2009.
Notes:
[1] Includes requirements for bicycle lockers and on-site showers and parking spaces for carpools.[6]
[2] Does not include 2,174 MTons of reductions associated with preferred parking for carpools and vanpools.

Sustainable Communities Strategies

The recent passage of SB 375 creates a process by which governments coordinate with the regional planning agencies to achieve GHG emission reductions through integrated development patterns, improved transportation planning, and other transportation measures and policies. Integration of the Sustainable Communities Strategies (SCS) or Alternative Planning Strategies with local general plans will be key to the achievement of these goals. In 2007 the CEC published *The Role of Land Use in Meeting California's Energy and Climate Change Goals.* In this publication, the CEC acknowledged that California's land use patterns shape energy use and the production of GHG. Transportation contributes a large percentage of the State's GHG emissions and research shows that increasing a community or development's density and accessibility to job centers are the two most significant factors for reducing vehicle miles traveled through design (CEC 2007). Consistency with the SCS for the SCAG region would reduce VMT and trips within the region as a whole. While regional GHG emissions reduction targets and the SCS have not yet been established for the SCAG region, SCAG's Compass Blueprint is a multiphased program that addresses the region's growth issues. The Compass Vision, 2% Strategy, and Blueprint programs help to establish a roadmap to plan and manage the future growth of the SCAG region. The west portion of the IBC is identified as an Opportunity Area, which are key parts of the region targeted for growth (SCAG 2009a). However, SCAG is anticipated to include all of the IBC in the area as part of the Compass Vision. The project is a mixed-use project consistent with the strategies of SCAG (see Section 5.8, *Land Use and Planning*).

5.15.4 Cumulative Impacts

As described under Impact 5.15-1, project-related GHG emissions are not confined to a particular air basin but are dispersed worldwide. Therefore, impacts identified under Impact 5.15-1 are not project-specific impacts to global warming but the project's contribution to this cumulative impact. Because the project's GHG emissions were considered less than significant with incorporation of the PPPs~~,~~ and PDFs~~, and Mitigation Measure 15-1~~, the project's GHG

[1] Approximately 2,174 MTons of GHG emissions reductions from preferential parking for carpools and vanpools as part of a TMA program (PDF 15-7) was included as part of the non-residential buildings strategy. Also includes 704 MTons from secure bicycle parking and storage facilities for employees and visitors as part of a TMA program (PDF 15-7).

emissions and contribution to global climate change impacts are considered less than cumulatively considerable and therefore also less than significant.

5.15.5 Level of Significance Before Mitigation

Upon implementation of regulatory requirements and standard conditions of approval, the following impacts would be less than significant: ~~5.2-5 and 5.2-7~~ 5.15-1.

~~Without mitigation, the following impacts would be **potentially significant**:~~

- ~~Impact 5.15-1 Project-related greenhouse gas emissions could significantly contribute to global climate change impacts or conflict with the CARB-Adopted Scoping Plan.~~

5.15.6 Mitigation Measures

No mitigation measures are necessary.

~~MM 15-1 Prior to the issuance of building permits in the IBC Vision Plan Area, the City shall establish a renewable energy and existing building retrofit program that will establish a framework for funding and implementing renewable energy projects and energy efficiency retrofits of existing buildings within the IBC Vision Plan area or the City as a whole. Applicants for new development projects within the IBC Vision Plan area shall submit evidence to the satisfaction of the Director of Community Development that the retrofits and/or renewable energy (which may include solar thermal, solar photovoltaic, wind, or other sources approved by the City) of existing buildings equates to the reduction of greenhouse gas (GHG) emissions by 32 percent of nontransportation sources. Applicants for new development projects shall first attempt to accomplish renewable energy production or energy efficiency retrofits of existing buildings within the IBC Vision Plan area. If deemed acceptable to the Director of Community Development, applicants for new development projects can implement new renewable energy production or energy efficiency retrofits of existing buildings within the City of Irvine to reduce GHG emissions. However, all renewable energy production or energy efficiency retrofits must be within the City limits.~~

5.15.7 Level of Significance After Mitigation

~~The City has issued a request for proposal for establishing the City's Residential Retrofit Program and Sustainable Facilities Program (commercial and municipal facilities). The Residential Retrofit Program will be designed to overcome financial barriers to making energy efficiency improvements and installing renewable energy systems at individual residents. The Sustainable Facilities Program will address ongoing operations and maintenance of commercial and municipal facilities including energy and water use, waste management, purchasing, transportation, indoor environmental quality, site management, and construction and green cleaning practices. The City is proposing to prepare these programs in 2010 so that the Residential Retrofit Program and Sustainable Facilities Program are in effect by Spring of 2011. Mitigation Measure 15-1 would ensure that applicants for new development within the IBC implement GHG emissions offsets equivalent to 32 percent of the projects nontransportation emissions at buildout. Table 5.15-7 shows GHG emissions reductions associated with the additional GHG reduction strategy.~~

~~*Table 5.15-7*~~
~~*Nontransportation GHG Reductions Associated with PPPs, PDFs, and Mitigation Measure*~~

~~**PPP/PDF**~~	~~**Action**~~	~~**GHG Emissions Reductions from Proposed General Plan BAU (P2030) in MTons of CO_{2e}**~~

~~**Nontransportation**~~		~~**30,618 MTons**~~
~~**Citywide PPPs and PDFs**~~		
~~PDF 15-16~~	~~Residential Buildings: GreenPoint Rated Residential Buildings~~	~~7,303~~
~~PDF 15-17~~	~~Non-Residential Buildings Designed to Earn the Energy Star~~	~~16,252[1]~~
~~PPP 15-1 and PPP 15-13~~	~~Solid Waste: C&D Debris Recycling and Reuse Ordinance and Waste Reduction~~	~~4,889~~
	~~**Subtotal Citywide PPPs and PDFs**~~	~~28,444 MTons~~
~~**Statewide and Federal PPPs**~~		
~~PPP 15-4~~	~~California Renewable Portfolio Standard~~	~~16,792~~
~~PPP 15-3~~	~~Title 24 Code Cycles: Net Zero Buildings~~ ~~Residential~~ ~~Non-Residential~~	 ~~60,180~~ ~~73,892~~
	~~**Subtotal Statewide and Federal PPPs**~~	~~150,864 MTons~~
~~**Mitigation Measure**~~		
~~MM 15-1~~	~~Renewable Energy and Existing Building Retrofits[2]~~	~~81,850~~
	~~**Subtotal Mitigation Measure**~~	~~81,850 MTons~~
~~**Nontransportation Reductions from Post-2030 BAU**~~		~~**261,158 MTons**~~
~~Nontransportation Target for Post-2030~~		~~224,899 MTons~~
~~Achieves Nontransportation GHG Target?~~		~~Yes~~

~~Source: CTG 2009.~~
~~Notes:~~
~~[1] Does not include 2,174 MTons of reductions associated with preferred parking for carpools and vanpools.~~
~~[2] The Renewable Energy and Existing Buildings Retrofit programs are an emissions offset program that will be implemented by spring of 2011. Based on the draft Climate Action Plan, there is a potential for 181,889 MTons of reductions within the entire City for residential, commercial, and municipal buildings. Within the IBC Vision Plan area, the amount of reductions from the retrofit programs is 81,850 MTons; however, to achieve the 15 percent reduction from Existing Conditions for this project, only 45,591 MTons is necessary.~~

~~As shown in Table 5.15-7, the additional Mitigation Measure would substantially reduce nontransportation GHG emissions to achieve the City's 15 percent GHG reduction target. Nontransportation PPPs, PDFs, and the Mitigation Measure would result in 261,158 MTons of GHG reductions.[7]~~ Table ~~5.15-8~~ 5.15-7 shows the GHG emissions inventory for the IBC Vision Plan for the following scenarios:

[7] Excludes the 2,174 MTons of reductions associated with preferred parking for carpools and vanpools for strategy PDF 15-17, Non-Residential Buildings Designed to Earn the Energy Star.

GLOBAL CLIMATE CHANGE

Existing Conditions (2008)

- Proposed General Plan BAU (P2030)
- Proposed General Plan (P2030) with PPPs~~,~~ and PDFs~~, and Mitigation Measure~~

As shown in this Table, GHG emissions inventory at buildout with reduction would be ~~668,672~~ 750,522 MTons with PPPs~~,~~ and PDFs~~, and Mitigation Measure 15-1~~, which is approximately ~~26~~ 17 percent lower than existing conditions. Therefore~~, with implementation of Mitigation Measure 15-1~~, impacts to global climate change are less than significant.

Table ~~5.15-8~~ 5.15-7
Comparison of Annual GHG Emissions Inventory for the Irvine Business Complex

Source	Existing Conditions (2008)	Proposed General Plan BAU (P2030)	Proposed General Plan (P2030) with PPPs, PDFs, and MM
Transportation			
Transportation	683,499	872,087	512,956
Nontransportation			
Residential	13,957	122,788	47,359
Non-Residential	159,742	191,254	97,791
Hotel	6,410	7,996	3,988
Infrastructure	7,229	8,314	7,898
Water	3,319	5,497	4,394
Solid Waste	35,196	48,953	44,064
Construction	0	32,072	32,072
~~Existing Building Retrofits[1]~~	—	—	~~-81,850~~
Subtotal Nontransportation	225,853	416,874	~~155,715~~ 237,566
Total	**909,352**	**1,288,961**	**~~668,672~~ 750,522**

Source. CTG 2009.
Notes:
PPP: plans, programs, and policies; PDF: project design features; MM: mitigation measures.
[1] The Renewable Energy and Existing Buildings Retrofit programs are an emissions offset program that will be implemented by spring of 2011. Based on the draft Climate Action Plan, there is a potential for 181,889 MTons of reductions within the entire City for residential, commercial, and municipal buildings. Within the IBC Vision Plan area, the amount of reductions from the retrofit programs is 81,850 MTons (approximately 45 percent); however, to achieve the 15 percent reduction from Existing Conditions for this project, only 45,591 MTons is necessary.