

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

### 4.6 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This chapter evaluates the potential impacts related to greenhouse gas (GHG) emissions that could occur as a result of Scenarios 5 and 6. Because no single project is large enough individually to result in a measurable increase in global concentrations of GHG emissions, global warming impacts of a project are considered on a cumulative basis. This section is based on the methodology recommended by the Bay Area Air Quality Management District (BAAQMD). The proposed Plan is evaluated using BAAQMD's plan-level review criteria based on the preliminary information available. Transportation sector emissions are based on trip generation and average vehicle miles traveled (VMT) provided by Hexagon Transportation Engineers (Hexagon). The GHG emissions modeling are included in Appendix C, Air Quality and Greenhouse Gas Emissions Modeling, of this Supplement to the Draft EIR. Appendix C in this Supplement to the Draft EIR replaces Appendix C that was included in the February 2016 Draft EIR.

This analysis is based on the Regulatory Framework and Existing Conditions information provided in the February 2016 Draft EIR, with the exception of the revisions noted below.

#### 4.6.1 ENVIRONMENTAL SETTING

No revisions are required to the Regulatory Framework and Existing Conditions information presented in the February 2016 Draft EIR, except for the following changes (deletions are shown in ~~strike through~~ and additions are underlined):

- The regulatory setting has been updated to incorporate a discussion on *Safeguarding California*, which is California's adaptation strategy that is required to be updated pursuant to Executive Order B-30-15.
- The regulatory setting has been updated to incorporate an updated discussion to reflect the City's recent adoption of the Sustainability and Climate Action Plan (S/CAP) Framework, Principals, and Guidelines.
- The regulatory setting has been updated to incorporate the recently passed Senate Bill (SB) 32, which establishes a legislative target for year 2030. Additionally, a brief discussion has been added regarding preparation of the California Air Resources Board's *2030 Target Scoping Plan Update*, which will reflect the new legislative goal for year 2030.
- The regulatory setting has been updated to incorporate the recently adopted Senate Bill 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants.
- Minor update to reflect the state's current standing in magnitude of GHG emissions compared to the rest of the world.
- Existing permitted emissions from Stanford University and permitted sources of GHG emissions in the City have been updated based on 2014 data provided by BAAQMD in May 2016.

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- The transportation emissions in Scenarios 1 through 4 have been updated to reflect the updated methodology in the 2014 Scoping Plan update to convert NO<sub>2</sub> to NO<sub>x</sub>. Additionally, the fleet mix for Scenarios 1 through 4 has been corrected to reflect the percent passenger vehicles and commercial trucks (fleet mix) for each scenario based on data provided in the traffic impact analysis.

### 4.6.1.2 REGULATORY FRAMEWORK

#### State Laws

##### *Executive Order B-30-15*

Executive Order B-30-15, signed April 29, 2015, sets a goal to reduce GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal of Executive Order B-30-15 as well as the long-term goal for 2050 in Executive Order S-03-5. It also requires the Natural Resources Agency to conduct triennial updates to the California adaption strategy, *Safeguarding California*, in order to ensure climate change is accounted for in state planning and investment decisions.

##### Safeguarding California

The California Natural Resource Agency is currently preparing an update to *Safeguarding California*, anticipated by January 2017. Safeguarding California builds upon California's first comprehensive plan for adapting to climate change, the 2009 *California Climate Adaptation Strategy*. The Plan documents how the State will build the resilience in communities in ecosystems to the emerging impacts of climate change. The Plan integrates 10 implementation plans for adaptation sectors: Agricultural, Biodiversity and Habitat, Emergency Management, Energy, Forestry, Land Use and Community Development, Oceans and Coastal Resources and Ecosystems, Public Health, Transportation, and Water. Strategies that are present across all sectors include:

- Making the risks Californians face from a changing climate an integral part of all core functions of government.
- Providing risk reduction measures for California's most vulnerable populations.
- Identifying significant and sustainable funding sources for investments that reduce climate risks, human loss, and disaster spending.
- Supporting continued climate research and data tools to inform policy and risk reduction activities.
- Maximizing returns to investments by prioritizing projects that produce multiple benefits and promote sustainable stewardship of California's resources.
- Promoting collaborative and iterative processes for crafting and refining climate risk management strategies.

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- Supporting regional and local approaches to integrate sectors and address priorities across California's diverse regions.<sup>1</sup>

### Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and Assembly Bill 197 into law, making the Executive Order goal of 40 percent below 1990 levels for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

### 2017 Climate Change Scoping Plan Update

Executive Order B-30-15 and SB 32 require CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. On January 20, 2017, CARB released the *Draft 2017 Climate Change Scoping Plan Update* (2017 Draft Scoping Plan), with adoption hearings planned for April 2017. The 2017 Draft Scoping Plan includes potential regulations and programs, including strategies consistent with AB 197 requirements to achieve the 2030 target. The 2017 Draft Scoping Plan establishes a new emissions limit of 260 MMTCO<sub>2</sub>e for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030.

California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030).
- Implementing SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.

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<sup>1</sup> California Natural Resources Agency, 2016. Safeguarding California: Implementation Action Plans.  
<http://resources.ca.gov/docs/climate/safeguarding/Safeguarding%20California-Implementation%20Action%20Plans.pdf>.

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- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydrofluorocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20 percent reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to the statewide strategies listed above, the 2017 Draft Scoping Plan also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 MTCO<sub>2</sub>e or less per capita by 2030 and 2 MTCO<sub>2</sub>e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.

### Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH<sub>4</sub>. Black carbon is the light-absorbing component of fine particulate matter (PM) produced during incomplete combustion of fuels. SB 1383 requires the State board, no later than January 1, 2018, to approve and begin implementing that comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030, as specified. The bill also establishes targets for reducing organic waste in landfill. In April 2016, CARB adopted the *Proposed Short-Lived Climate Pollutant Strategy*, which identifies the State's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use. In-use on-road rules are expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020.

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### Local Regulations and Policies

#### *Palo Alto Climate Protection Plan (CPP) and Draft Sustainability and Climate Action Plan (S/CAP)*

Since adoption of the *Climate Protection Plan* (CPP) by Council in December 2007, and adoption of updated goals in 2010, the City of Palo Alto’s municipal operations (City) and the Palo Alto Community (Community) have made considerable progress in reducing their carbon footprint and adopting sustainable practices.<sup>2</sup> Based on data for the calendar year ~~2014~~ 2015, Palo Alto has cut its overall GHG emissions by an estimated ~~32 percent from 2005 levels and 37-36 percent~~ from 1990 levels. The main driver of the GHG emissions reductions include bold actions such as achieving carbon neutral electricity, and systematic improvements ranging from water conservation and electric vehicle (EV) readiness to green building ordinances and safe routes to schools.<sup>3</sup>

But, like most cities, Palo Alto must take additional action to meet the long-term GHG emissions reduction challenge to reduce GHG emissions 80 percent below 1990 levels by 2050 identified within Executive Order S-03-05. Therefore, in coordination with the proposed Plan, the City is developing a Sustainability and Climate Action Plan (S/CAP). The S/CAP evaluates GHG emissions within the City boundaries and actions the City can take to achieve its own and the State’s GHG emissions reduction goals.

On April 28, 2016, the City of Palo Alto City Council reviewed a draft of the S/CAP and adopted its goal of reducing GHG emissions 80 percent below 1990 levels by 2030. To achieve the City’s GHG reduction goal, the plan focuses on pathways to a low carbon future and initiatives addressing water, green infrastructure, adaptation and regeneration as part of a holistic framework for sustainability. The S/CAP contains goals and strategies for reducing Palo Alto’s GHG emissions to 80 percent below 1990 levels by 2030 (“80x30”), 20 years ahead of the State of California “80x50” target. More specifically, ~~Some of the~~ key strategies under evaluation for Palo Alto’s pathway to a low-carbon—or no carbon—future include ~~radical~~ resource efficiency, comprehensive electrification (“fuel switching” from fossil fuels to carbon-neutral electricity), local renewable energy generation and distributed energy storage, rethinking mobility to provide more convenient transportation with less congestion, forthrightly facing water risk, bringing municipal operations—from facilities to fleets—in line with Council policy and community vision, exploring future business implications for CPAU as it adapts to new conditions, and broadening our focus from “sustainability” —a broad notion of “do no harm”—to “adaptation” —expanding Palo Alto’s capacity to respond and thrive in the face of shocks and stresses like drought and sea level rise—to “regeneration” —building the health and vitality and the ecosystems, both local and far-flung, that support it.

<sup>2</sup> Palo Alto, ~~2015~~ 2016. City Council Information Report ID# ~~5693~~ 54308, Annual Earth Day Report Study Session and Sustainability/Climate Action Plan (S/CAP) Update, April ~~20~~ 18.

<sup>3</sup> Palo Alto, ~~2015~~ 2016. City Council Information Report ID# ~~5693~~ 54308, Annual Earth Day Report Study Session and Sustainability/Climate Action Plan (S/CAP) Update, April ~~20~~ 18.

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On November 28, 2016, the City of Palo Alto City Council reviewed and approved the S/CAP framework, including key strategies, design principles and guidelines, and decision criteria. These key strategies included:

- Development of a Carbon Neutral Natural Gas strategy (which moves City the next step along the trajectory from Carbon Neutral Electricity to Carbon Neutral Utility to Carbon Neutral City);
- Adoption of an advanced Green Building Ordinance and Energy Reach Code;
- Continued analysis of electrification options;
- Exploration of Zero Net Energy buildings and districts.<sup>4</sup>

S/CAP implementation plans are currently being prepared and will provide detail regarding necessary actions to achieve the City's GHG reduction target for 2030.

### 4.6.1.3 EXISTING CONDITIONS

#### California's Greenhouse Gas Sources and Relative Contribution

California is the ~~tenth~~-20<sup>th</sup> largest GHG emitter in the world, and the second largest emitter of GHG in the United States, surpassed only by Texas; however, California also has over 12 million more people than the state of Texas.<sup>5</sup> 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<sub>2</sub> emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services).<sup>6</sup>

The California Air Resources Board (CARB)'s latest update to the statewide GHG emissions inventory using the IPCC's *Second Assessment Report* (SAR) GWPs was conducted in 2012 for year 2009 emissions.<sup>7</sup> In 2009, California produced 457 million metric tons (MMT) of CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 37.9 percent of the State's total emissions. Electricity consumption is the second largest source, comprising 22.7 percent. Industrial activities are California's third largest source of GHG emissions, comprising 17.8 percent of the

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<sup>4</sup> Palo Alto, City of. 2016. Sustainability and Climate Action Plan, Framework, Principals, Guidelines, Goals, and Strategies, November.

<sup>5</sup> California Energy Commission, 2005, Climate Change Emissions Estimates from Bemis, Gerry and Jennifer Allen, Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2002 Update, California Energy Commission Staff Paper CEC-600-2005-025, Sacramento, California, June; California Air Resources Board, 2014, May. California Greenhouse Gas Emission Inventory: 2000-2012. [https://www.arb.ca.gov/cc/inventory/pubs/reports/ghg\\_inventory\\_00-12\\_report.pdf](https://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf).

<sup>6</sup> California Energy Commission, 2006. Inventory of California Greenhouse Gas Emissions and Sinks 1990 to 2004, Report CEC-600-2006-013-SF, December.

<sup>7</sup> Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (2006).

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state's total emissions. Other major sectors of GHG emissions include commercial and residential, recycling and waste, high global warming potential GHGs, agriculture, and forestry.<sup>8,9</sup>

In 2015, the statewide GHG emissions inventory was updated for 2000 to 2013 emissions using the GWPs in IPCC's *Fourth Assessment Report (AR4)*. Based on these GWPs, California produced 459 million metric tons (MMT) CO<sub>2</sub>e GHG emissions in 2013. California's transportation sector remains the single largest generator of GHG emissions, producing 36.8 percent of the State's total emissions. Electricity consumption made up 19.7 percent, and industrial activities produced 20.2 percent. Other major sectors of GHG emissions include commercial and residential, recycling and waste, high global warming potential GHGs, and agriculture.<sup>10</sup>

### Communitywide Greenhouse Gas Emissions

Table 4.6-5 shows existing community-wide GHG emissions in the city and SOI.<sup>11</sup> The GHG emissions inventory follows ICLEI's *U.S. Community Protocol for Accounting and Reporting of GHG Emissions* for sources that are under the jurisdictional control of the City of Palo Alto. The GHG emissions inventory is based on activity data for energy use (natural gas and electricity), solid waste, and water use and wastewater generation for the City of Palo Alto and the SOI provided by CPAU. Transportation emissions are based on origin-demand travel data for Palo Alto and SOI residents and employees compiled by Hexagon Transportation Consultants, Inc., as modeled using the VTA regional transportation demand model (see Appendix H.G, Transportation Impact Analysis). The inventory also includes an estimate of GHG emissions from off-road equipment based on county-level data. For further discussion of the emissions inventory methodology, see Section 4.6.3, Methodology, of the February 2016 Draft EIR.

Stationary sources of GHG emissions are not under the direct control of the City of Palo Alto because they require a permit from BAAQMD. However, because this data is available from BAAQMD for the City of Palo Alto and provides a more complete snapshot of the sources of emissions within the city, Table 4.6-5 includes emissions from stationary source emissions as well. However, these emissions are not traditionally considered in local GHG emissions target setting for GHG emissions planning purposes because they are regulated separately by BAAQMD and CARB.

<sup>8</sup> CO<sub>2</sub>-equivalence is used to show the relative potential that different GHGs 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.

<sup>9</sup> California Air Resources Board, 2012. California Greenhouse Gas Inventory for 2000–2009: By Category as Defined by the Scoping Plan, April.

<sup>10</sup> California Air Resources Board (CARB), 2015. California Greenhouse Gas Inventory for 2000–2013: By Category as Defined by the Scoping Plan, April 24.

<sup>11</sup> The 2015 Earth Day Report included an on-road transportation sector emissions inventory for the City, which was based on CARB's EMFAC2015, Version 1.0.1. Changes to the 2014 emissions inventory included in the February 2016 Draft EIR include use of a newer version of EMFAC (EMFAC2014, Version 1.0.7) and a revised transportation analysis conducted by Hexagon. Other more nominal differences between the modeling conducted for the February 2016 Draft EIR and the 2015 Earth Day Report include revisions to the calculation methodology for the on-road transportation sector for converting NO<sub>x</sub> to N<sub>2</sub>O identified by CARB reflected in this Supplement to the Draft EIR. As a result of the changes in methodology, GHG emissions in Table 4.6-5 are slightly lower than reported in the 2015 Earth Day Report (841 MTCO<sub>2</sub>e).

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TABLE 4.6-5 BASELINE YEAR (2014) GHG EMISSIONS (CITY OF PALO ALTO SPHERE OF INFLUENCE)

Sector	City 2014 MtCO <sub>2</sub> e	City + SOI 2014 MtCO <sub>2</sub> e	City + SOI % of Inventory
Transportation <sup>a</sup>	<del>329,296</del> <u>329,963</u>	<del>394,661</del> <u>395,436</u>	66%
Residential (Natural Gas and Electricity) <sup>b</sup>	57,265	66,342	11%
Non-residential (Natural Gas and Electricity) <sup>b</sup>	96,869	102,319	17%
Waste <sup>c</sup>	6,300	7,101	1%
Water/Wastewater <sup>d</sup>	823	1,012	<1%
Other – Off-road Equipment <sup>e</sup>	28,964	29,573	5%
<b>Total Community Emissions</b>	<del>519,517</del> <u>520,184</u>	<del>601,008</del> <u>601,783</u>	100%
Service Population <sup>f</sup>	161,145	181,635	—
MtCO <sub>2</sub> e/SP	<del>3.22</del> <u>3.23</u>	3.31	—
<b>BAAQMD Permitted Sources<sup>g</sup></b>			
<u>Permitted Facilities in the City</u> <del>Facilities</del>		<del>12,932</del> <u>12,956</u>	—
Stanford University		<del>234,097</del> <u>209,377</u>	—
<b>Total Permitted</b>		<del>247,029</del> <u>222,332</u>	—

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Second Assessment Report (SAR).

This table is a reproduction and expansion of Table 4.6-5 in the February 2016 Draft EIR. Revisions to Table 4.6-5 are shown in ~~strickthrough~~ and underline.

Sources:

a. Based on on-road VMT provided by Hexagon and modeled using EMFAC2014-PL.

b. Based on electricity and natural gas use provided by CPAU. According to CPAU, CPAU electricity is carbon neutral. GHG emissions from natural gas use are based on the LGOP.

c. Based on fugitive emissions generated by solid waste disposal in the City obtained from CalRecycle and modeled using CARB's Landfill Emissions Tool. Does not include lifecycle emissions, including solid waste diverted from landfills.

d. Based on water demand and wastewater generation provided by CPAU. According to CPAU, CPAU electricity is carbon neutral. Fugitive GHG emissions from wastewater treatment use are based on the LGOP emissions factors.

e. GHG emissions from off-road equipment use are based on OFFROAD2007.

f. Based on 64,685 people and 95,460 employees in the city in 2014. Based on 80,805 people and 100,830 employees in the city and SOI in 2014.

g. These emissions are not regulated by the City but provided for informational purposes. Includes GHG emissions from permitted sources in the city and Stanford University provided by BAAQMD for 2011, which is the latest data available on BAAQMD's website. Excludes permitted emissions from the City of Palo Alto Landfill, ~~and~~ the Palo Alto Regional Water Quality Control Plant, and other municipal facilities to avoid double-counting with the community-wide GHG emissions inventory.

### 4.6.2 STANDARDS OF SIGNIFICANCE

The proposed Plan would result in a significant GHG emissions impact if it would:

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



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- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.
- Expose people or structures to the physical effects of climate change, including but not limited to flooding, public health, wildfire risk, or other impacts resulting from climate change.

Application of these criteria in the following sections is based on BAAQMD guidance, which is described in detail in the February 2016 Draft EIR. No changes to the application of these criteria has been made as part of this Supplement to the Draft EIR, with the exception of an update to the City's 2050 GHG estimated efficiency target, as described below.

The BAAQMD CEQA Guidelines include methodology and thresholds for GHG impacts for general plan analyses that are consistent with the GHG reduction goals of AB 32. Therefore, the impact of a general plan is less than significant if it:<sup>12</sup>

1. Reduces emissions to 1990 GHG emission levels by 2020; or
2. Reduces emissions to 15 percent below 2008 or earlier emission levels by 2020; or
3. Meets the plan efficiency threshold of 6.6 MTCO<sub>2</sub>e per service population per year.

BAAQMD's third criterion (see list above) that evaluates the efficiency of the plan was also used to determine potential impacts of the proposed Project. The proposed Project horizon year is 2030; therefore, the BAAQMD efficiency target has been extrapolated to 2030 based on the GHG reduction goal of SB 32, which is to reduce GHG emissions 40 percent below 1990 levels by 2030, as described below:

- The City's 2020 GHG estimated efficiency target would be 6.6 MTCO<sub>2</sub>e per service population, per year, to align with BAAQMD's CEQA Guidelines.<sup>13</sup>
- The City's 2030 GHG estimated efficiency target would be 4.0 MTCO<sub>2</sub>e per service population, per year, to align with the mid-term GHG reduction goal of SB 32.

The February 2016 Draft EIR had previously identified a 2050 GHG estimated efficiency target of 1.3 MTCO<sub>2</sub>e. However, the since the horizon year for the General Plan is only until 2030, and because there is no legislative mandate that requires the State to prepare a GHG reduction plan to achieve the Executive Order S-03-05 goals, this target has been removed as part of this Supplement to the Draft EIR.

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<sup>12</sup> BAAQMD's CEQA Guidelines also allow cities to tier from plans adopted to mitigate the effects of GHG emissions on a city/town level, consistent with AB 32 goals. Palo Alto does not currently have a qualified GHG reduction strategy. Therefore, the analysis of the Comprehensive Plan below does not rely on this threshold.

<sup>13</sup> As a reference using the latest 2016 CARB GHG emissions inventory, the current plan-level GHG efficiency is 8.2 MTCO<sub>2</sub>e per service population for year 2014 and the 1990 GHG efficiency was 9.7 MTCO<sub>2</sub>e/SP.

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### 4.6.3 IMPACT DISCUSSION

The remaining sections of this chapter provide an analysis of the potential project impacts, including impacts from growth expected to occur during the life of the proposed Plan, as well as cumulative GHG impacts that could occur as a result of the implementation of the proposed Plan when combined with projects outside of Palo Alto.

The conclusions below are based on the same analytical approach used in the impact discussions in the February 2016 Draft EIR. Life cycle emissions are not included in this analysis because not enough information is available for the proposed project, and therefore life cycle GHG emissions would be speculative.<sup>14,15</sup> Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the state's AB 32 inventory and treats this short-lived climate pollutant separately.<sup>16,17</sup>

The relevant characteristics of Scenarios 5 and 6 are described in detail in Section 3.4 of Chapter 3, Project Description, of this Supplement to the Draft EIR.

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<b>GHG-1</b>	<b>The proposed Plan would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. (Less than Significant – Scenarios 5 and 6)</b>
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**February 2016 Draft EIR Findings:** Less than significant for Scenarios 1 through 4. As shown in the revised Table 4.6-7, GHG emissions associated with buildout of Scenarios 1 to 4 have been updated to show a net decrease in GHG emissions compared to existing conditions in the city and the city and SOI, ranging from 17 to 19 percent lower (previously calculated as 18 to 20 percent lower in the February 2016 Draft EIR). This update does not change the impact findings of the February 2016 Draft EIR.

**Summary of Supplemental Analysis:** The impact would be less than significant under Scenarios 5 and 6.

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<sup>14</sup> Life cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted.

<sup>15</sup> Governor's Office of Planning and Research, 2008, CEQA and Climate Change: Addressing Climate Change Through CEQA Review. Technical Advisory, <http://www.opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf>.

<sup>16</sup> Particulate matter emissions, which include black carbon, are analyzed in Section 5.2, *Air Quality*. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years.

<sup>17</sup> California Air Resources Board, 2016, Proposed Short-Lived Climate Pollutant Reduction Strategy. <https://www.arb.ca.gov/cc/shortlived/meetings/04112016/proposedstrategy.pdf>.

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An estimate of GHG emissions in the city in year 2020 is included in Table 4.6-6, which is based on the ABAG population and employment projections for the city and SOI.<sup>18</sup> Compared to the existing baseline emissions inventory, the proposed Plan would experience a decrease of GHG emissions in 2020 as a result of State and federal regulations adopted to reduce GHG emissions and turnover of California's on-road vehicle fleets. Based on the City's 1990 emissions inventory conducted for the Earth Day Report<sup>19</sup> and the forecast in Table 4.6-6, the City would achieve 1990 emissions levels and surpass the goal for 2020 of 711,810 MTCO<sub>2</sub>e (i.e., forecasted emissions levels would be below 1990 levels). Additionally, the City would achieve BAAQMD's year 2020 efficiency metric of 6.6 MTCO<sub>2</sub>e/SP, which is consistent with the GHG reduction targets of AB 32.

To ensure that the City maintains a trajectory that is consistent with the State's long-term GHG reduction goals, the planning scenarios analyzed in this EIR also include the following sustainability initiatives that would reduce GHG emissions from residential and non-residential development:

- Paid transit passes for employees in workplaces with over 50 employees (or alternative employee commuter benefit, consistent with BAAQMD Regulation 14, Rule 1) (all scenarios).
- Employer incentives for carpooling and bicycling (Scenarios 2 through 6).
- Unbundled parking costs for multi-family units (Scenarios 3 through 6).
- Parking charges for workplaces with over 50 employees (Scenarios 4 through 6).
- Paid parking in Downtown and California Avenue areas (Scenarios 4 through 6).
- Free transit passes for all Palo Alto residents in transit-accessible areas (Scenarios 4 through 6).

The community-wide GHG emissions inventory for the proposed Plan scenarios is included in Table 4.6-7. Emissions generated by additional growth in the city and SOI would be offset by a reduction in existing emissions from implementation of federal, State, and local regulations and programs adopted to reduce GHG emissions and from turnover of California's on-road vehicle fleets. Compared to the existing baseline emissions inventory, the proposed Plan would experience a decrease of GHG emissions in 2030. As identified by the California Natural Resources Agency's "Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to Senate Bill 97" (2009), the CEQA Guidelines do not establish a zero emissions threshold of significance because there is no "one molecule rule" in CEQA, meaning that a project that does not generate an increase emissions or generates a net decrease in emissions does not result in a significant impact (i.e., the impact threshold should be set at some point above zero). GHG emissions in the city and the city and SOI for Scenarios 5 and 6 would range from approximately 19 percent to 23 percent less than

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<sup>18</sup> ABAG projections for housing and population are larger than the City's own projections for housing and population growth within the City boundaries.

<sup>19</sup> To ensure consistency between the community emissions inventory conducted for the Comprehensive Plan, the "Other" emissions category was not included in the total above; and therefore, the 1990 level identified above is conservative (low) as a baseline because it does not include emissions from the off-road, waste, and water/wastewater sectors.

## GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

TABLE 4.6-6 2020 PALO ALTO PROPOSED PLAN COMMUNITY GHG EMISSIONS INVENTORY

Category	GHG Emissions (MtCO <sub>2</sub> e/Year)					
	2014 Existing City Only	Year 2020 Forecast City Only	Change from Existing City Only	2014 Existing City + SOI	Year 2020 Forecast City + SOI	Change from Existing City + SOI
Transportation <sup>a</sup>	<del>329,296</del> <u>329,963</u>	<del>284,141</del> <u>284,474</u>	<del>-45,154</del> <u>-45,489</u>	<del>394,661</del> <u>395,436</u>	<del>302,989</del> <u>303,333</u>	<del>-91,672</del> <u>-92,103</u>
Residential (Natural Gas and Electricity) <sup>b</sup>	57,265	58,398	1,133	66,342	<del>72,803</del> <u>74,126</u>	<del>6,461</del> <u>6,689</u>
Non-residential (Natural Gas and Electricity) <sup>b</sup>	96,869	106,368	9,498	102,319	112,081	9,762
Waste <sup>c</sup>	6,300	6,854	554	<del>6,300</del> <u>7,101</u>	7,782	681
Water/Wastewater <sup>d</sup>	823	810	-13	1,012	1,073	61
Other – Off-road Equipment <sup>e</sup>	28,964	26,671	-2,293	29,573	27,282	-2,291
<b>Total Community Emissions</b>	<del>519,517</del> <u>520,184</u>	<del>483,242</del> <u>483,575</u>	<del>-36,275</del> <u>-36,609</u>	<del>600,207</del> <u>601,783</u>	<del>524,010</del> <u>524,582</u>	<del>-76,998</del> <u>-77,201</u>
Percent Change from Existing	—	—	-7%	—	—	-13%
Service Population <sup>f</sup>	181,635	175,320	—	181,635	199,050	—
MtCO <sub>2</sub> e/SP	<del>3.22</del> <u>3.23</u>	2.76	—	<del>3.30</del> <u>3.31</u>	<del>2.63</del> <u>2.64</u>	—
BAAQMD GHG 2030 Efficiency Target	NA	6.6	—	NA	6.6	—
Achieves BAAQMD GHG Plan-Level Threshold?	—	Yes	—	—	Yes	—
Achieves 1990 Emissions of 711,840 MtCO <sub>2</sub> e (City only) <sup>g</sup>		Yes		NA	—	—

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Second Assessment Report (SAR).

This table is a reproduction and expansion of Table 4.6-6 in the February 2016 Draft EIR. Revisions to Table 4.6-6 are shown in ~~strike through~~ and underline.

Sources:

a. Based on on-road VMT provided by Hexagon and modeled using EMFAC2014-PL.

b. Based on electricity and natural gas use provided by CPAU. According to CPAU, CPAU electricity is carbon neutral. GHG emissions from natural gas use are based on the LGOP. The table includes the natural gas use provided by City of Palo Alto Utilities, both for residential and non-residential uses in the city and SOI. Customers may participate in the PaloAltoGreen Gas (PAGG) program, which would reduce community emissions. Palo Alto expects that about 10 percent of the city's gas load (both for residential and non-residential) will participate in PAGG in 2020. In addition, electrification of gas appliances (e.g., water heaters, space heaters, dryers, and cooktops) would also reduce natural gas use and increase carbon neutral electric use. The EIR is conservative and does not include additional local reductions from participation in the PAGG program or conversion of natural gas appliances to electric appliances.

c. Based on solid waste disposal in the city obtained from CalRecycle and modeled using CARB's Landfill Emissions Tool.

d. Based on water demand and wastewater generation provided by CPAU. According to CPAU, CPAU electricity is carbon neutral. Fugitive GHG emissions from wastewater treatment use are based on the LGOP emissions factors.

e. GHG emissions from off-road equipment use are based on OFFROAD2007.

f. Based on ABAG population and employment for Palo Alto + SOI in year 2020 (88,600 population and 110,450 employees) and for Palo Alto in year 2020 (70,500 population and 104,820 employees).

g. Based on the 2015 Palo Alto Earth Day Report and updated transportation emissions inventory prepared by Fehr & Peers for 1990.

**GREENHOUSE GAS EMISSIONS**

**TABLE 4.6-7 2030 PALO ALTO PROPOSED PLAN COMMUNITY GHG EMISSIONS INVENTORY**

Category	GHG Emissions (MtCO <sub>2</sub> e/Year)											
	Scenario 1 (2030 BAU) City Only	Scenario 2 City Only	Scenario 3 City Only	Scenario 4 City Only	Scenario 5 City Only	Scenario 6 City Only	Scenario 1 (2030 BAU) City + SOI	Scenario 2 City + SOI	Scenario 3 City + SOI	Scenario 4 City + SOI	Scenario 5 City + SOI	Scenario 6 City + SOI
	Transportation <sup>a</sup>	<del>209,599</del> <u>209,731</u>	<del>206,278</del> <u>214,954</u>	<del>210,486</del> <u>219,621</u>	<del>207,903</del> <u>217,810</u>	<u>199,381</u>	<u>211,985</u>	<del>265,088</del> <u>265,266</u>	<del>256,873</del> <u>256,299</u>	<del>260,962</del> <u>260,729</u>	<del>258,102</del> <u>258,743</u>	<u>239,505</u>
Residential (Natural Gas and Electricity) <sup>b</sup>	62,721	62,721	64,376	66,132	<u>64,376</u>	<u>69,301</u>	74,126	74,126	75,791	77,536	<u>75,791</u>	<u>80,716</u>
Non-residential (Natural Gas and Electricity) <sup>b</sup>	112,578	112,578	109,813	112,578	<u>105,865</u>	<u>105,865</u>	118,423	118,423	115,658	118,423	<u>111,710</u>	<u>111,710</u>
Waste <sup>c</sup>	7,163	6,943	7,128	7,314	<u>6,976</u>	<u>7,197</u>	8,089	7,869	8,054	8,240	<u>7,902</u>	<u>8,123</u>
Water/Wastewater <sup>d</sup>	810	810	810	810	<u>810</u>	<u>810</u>	1,073	1,073	1,073	1,073	<u>1,073</u>	<u>1,073</u>
Other – Off-road Equipment <sup>e</sup>	27,043	26,728	26,920	27,106	<u>26,702</u>	<u>26,794</u>	27,658	27,343	27,535	27,721	<u>27,317</u>	<u>27,409</u>
<b>Total Community Emissions</b>	<b><del>419,914</del> <u>420,046</u></b>	<b><del>416,058</del> <u>424,733</u></b>	<b><del>419,533</del> <u>428,669</u></b>	<b><del>421,842</del> <u>431,749</u></b>	<b><u>404,111</u></b>	<b><u>421,952</u></b>	<b><del>494,458</del> <u>494,636</u></b>	<b><del>485,707</del> <u>485,133</u></b>	<b><del>489,074</del> <u>488,841</u></b>	<b><del>491,095</del> <u>491,737</u></b>	<b><u>463,299</u></b>	<b><u>481,379</u></b>
Change from Existing	<del>-99,603</del> <u>-100,138</u>	<del>-103,459</del> <u>-95,451</u>	<del>-99,984</del> <u>-91,516</u>	<del>-97,675</del> <u>-88,435</u>	<u>-116,073</u>	<u>-98,232</u>	<del>-106,550</del> <u>-107,147</u>	<del>-115,301</del> <u>-116,650</u>	<del>-111,934</del> <u>-112,942</u>	<del>-109,913</del> <u>-110,046</u>	<u>-138,483</u>	<u>-120,404</u>
Percent Change from Existing	-19%	<del>-20%</del> <u>-18%</u>	<del>-19%</del> <u>-18%</u>	<del>-19%</del> <u>-17%</u>	<u>-22%</u>	<u>-19%</u>	-18%	-19%	-19%	-18%	<u>-23%</u>	<u>-20%</u>
Service Population <sup>f</sup>	183,225	177,595	182,335	187,080	<u>184,090</u>	<u>175,320</u>	206,910	201,280	206,020	210,765	<u>207,775</u>	<u>199,050</u>
MtCO <sub>2</sub> e/SP	2.29	<del>2.34</del> <u>2.39</u>	<del>2.30</del> <u>2.35</u>	<del>2.25</del> <u>2.31</u>	<u>2.20</u>	<u>2.41</u>	2.39	2.41	2.37	2.33	<u>2.23</u>	<u>2.42</u>
BAAQMD GHG 2030 Efficiency Target (MtCO <sub>2</sub> e/SP)	4.0	4.0	4.0	4.0	<u>4.0</u>	<u>4.0</u>	4.0	4.0	4.0	4.0	<u>4.0</u>	<u>4.0</u>
Achieves BAAQMD GHG Plan-Level Threshold?	Yes	Yes	Yes	Yes	<u>Yes</u>	<u>Yes</u>	Yes	Yes	Yes	Yes	<u>Yes</u>	<u>Yes</u>
Achieves <u>40% below</u> 1990 Emissions of 427,104 MTCO <sub>2</sub> e (City Only) <sup>g</sup>	Yes	Yes	<del>Yes</del> <u>No</u>	<del>Yes</del> <u>No</u>	<u>Yes</u>	<u>Yes</u>	—	—	—	—	<u>—</u>	<u>—</u>

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Second Assessment Report (SAR). This table is a reproduction and expansion of Table 4.6-7 in the February 2016 Draft EIR. Revisions to Table 4.6-7 are shown in ~~strike through~~ and underline. Sources:

a. Based on on-road VMT and fleet mix provided by Hexagon and modeled using EMFAC2014-PL.

b. Based on electricity and natural gas use provided by the CPAU. According to CPAU, CPAU electricity is carbon neutral. GHG emissions from natural gas use are based on the LGOP. The table includes the natural gas use provided by City of Palo Alto Utilities, both for residential and non-residential uses in the city and SOI. Customers may participate in the PaloAltoGreen Gas (PAGG) program, which would reduce community emissions. Palo Alto expects that about 10 percent of the City's gas load (both for residential and non-residential) will participate in PAGG in 2020 (an estimate is not yet available for the 2030 horizon). In addition, electrification of gas appliances (e.g., water heaters, space heaters, dryers, and

## GREENHOUSE GAS EMISSIONS

cooktops) would also reduce natural gas use and increase carbon neutral electric use. The EIR is conservative and does not include additional local reductions from participation in the PAGG program or conversion of natural gas appliances to electric appliances.

c. Based on solid waste disposal in the city obtained from CalRecycle and modeled using CARB's Landfill Emissions Tool.

d. Based on water demand and wastewater generation provided by CPAU. According to CPAU, CPAU electricity is carbon neutral. Fugitive GHG emissions from wastewater treatment use are based on the LGOP emissions factors.

e. GHG emissions from off-road equipment use are based on OFFROAD2007.

f. Based on the following for the City + SOI: Scenario 1: 90,210 people and 116,700 employees; Scenario 2: 90,210 people and 111,070 employees; Scenario 3, 92,045 people and 113,975 employees, Scenario 4: 94,065 people and 116,700 employees; Scenario 5: 92,045 people and 110,085 employees; Scenario 6: 97,690 people and 110,085 employees, as detailed in Chapter 3, Project Description, of this EIR. Based on the following for the City only: Scenario 1: 72,285 people and 110,940 employees; Scenario 2: 72,285 people and 105,310 employees; Scenario 3, 74,120 people and 108,215 employees, Scenario 4: 70,500 people and 104,820 employees EIR; Scenario 5: 74,120 people and 104,325 employees; Scenario 6: 79,765 people and 104,325 employees, as detailed in Chapter 3, Project Description, of this EIR.

g. Based on the 2015 Palo Alto Earth Day Report and updated transportation emissions inventory prepared by Fehr & Peers for 1990.

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the baseline community GHG emissions. Of the six scenarios, Scenario 5 would result in the lowest total emissions and would have the lowest emissions per service population.

BAAQMD has not adopted a 2030 per capita GHG threshold for operation-related GHG emissions. However, for the purposes of this EIR analysis, a 2030 efficiency target was derived for the proposed Plan based on the 2030 goal identified in SB 32, which is a 40 percent reduction from 1990 levels by 2030. Table 4.6-7 also shows that all the scenarios would achieve the BAAQMD efficiency metric for year 2030 that would ensure the City maintains a trajectory that is consistent with the GHG reduction target of SB 32.

The City's 1990 emissions inventory conducted for the Earth Day Report<sup>20</sup> was used to estimate the GHG target for the City in year 2030 consistent with the interim target of 40 percent below 1990 levels established in Senate Bill. Based on the City's 1990 inventory, the City would need to achieve a goal of 427,104 MTCO<sub>2</sub>e by 2030, under this BAAQMD criterion. As shown in Table 4.6-7, city emissions for Scenarios 1, 2, 5, and 6 would achieve the 2030 goal based on the City's 1990 emissions inventory. However, the City has now established a GHG reduction goal of 80 percent below 1990 levels by 2030 that is substantially more aggressive than the current legislative targets identified by the State.

The proposed Plan establishes the framework for future growth and development in Palo Alto. A general plan does not directly result in development without additional approvals. Before any development can occur in the city, it is required to be analyzed for consistency with the proposed Plan, zoning requirements, and other applicable local and State requirements; comply with the requirements of CEQA; and obtain all necessary clearances and permits. As identified in Table 4.6-7, all six scenarios would result in a decrease in emissions from existing conditions and would achieve the 2030 performance criteria that would ensure the City is on a trajectory to achieve the GHG reductions targets of SB 32 for year 2030. Consequently, GHG emissions impacts of the proposed Plan are *less than significant* even though additional measures would be needed to achieve the S/CAP goal of an 80 percent reduction below 1990 levels by 2030.

### Applicable Regulations:

- California Global Warming Solutions Act (AB 32)
- California Global Warming Solutions Act 2030 Emissions Limit (SB 32)
- Sustainable Communities and Climate Protection Act (SB 375)
- Greenhouse Gas Emission Reduction Targets (Executive Order S-3-05)
- Clean Car Standards – Pavley (AB 1493)
- Renewable Portfolio Standards (SB 1078)
- Clean Energy and Pollution Reduction Act of 2015 (SB 350)
- California Integrated Waste Management Act of 1989 (AB 939)
- California Mandatory Commercial Recycling Law (AB 341)

<sup>20</sup> To ensure consistency between the community emissions inventory conducted for the Comprehensive Plan, the "Other" emissions category was not included in the total above; and therefore, the 1990 level identified above is conservative because it does not include emissions from the off-road, waste, and water/wastewater sectors.

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- California Advanced Clean Cars CARB/ Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure (Title 17 CCR)
- Low Carbon Fuel Standard (Title 17 CCR)
- California Water Conservation in Landscaping Act of 2006 (AB 1881)
- California Water Conservation Act of 2009 (SBX7-7)
- Statewide Retail Provider Emissions Performance Standards (SB 1368)
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

**Significance before Mitigation:** As identified in Table 4.6-7, all six scenarios would result in a decrease in emissions from existing conditions and would achieve the 2030 performance criteria that would ensure the City is on a trajectory to achieve the GHG reductions targets of SB 32 of 40 percent below 1990 levels for year 2030 (the horizon year for the Plan). Consequently, GHG emissions impacts of the proposed Plan are less than significant.

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**GHG-2                      The proposed Plan could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases, requiring mitigation. (Less Than Significant – All Six Scenarios)**

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*February 2016 Draft EIR Findings:* Significant for Scenarios 1 through 4, requiring mitigation. Mitigation Measure GHG-2 would apply to all four scenarios but would not reduce the impact to a less-than-significant level. Therefore, the impact was identified as significant and unavoidable in the February 2016 Draft EIR.

*Summary of Supplemental Analysis:* The impact would be less than significant for all scenarios, including Scenarios 5 and 6.

The February 2016 Draft EIR identified consistency with plans adopted for the purpose of reducing GHG emissions as Significant for Scenarios 1 through 4, requiring mitigation. The February 2016 Draft EIR identified that Mitigation Measure GHG-2 would apply to all four scenarios but would not reduce the impact to a less-than-significant level. The February 2016 Draft EIR identified a 2050 GHG estimated efficiency target of 1.3 MTCO<sub>2</sub>e. However, since the horizon year for the General Plan is only until 2030, and because there is no legislative mandate that requires the State to prepare a GHG reduction plan to achieve the Executive Order S-03-05 goals, this target has been removed as part of this Supplement to the Draft EIR. The analysis in this section has been revised to analyze consistency with the plans that have been adopted and legislative targets in place at the horizon year of the Comprehensive Plan rather than the City's



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ability to achieve a long-term goal that is beyond the horizon of the Comprehensive Plan and for which no statewide strategy has been identified. Additionally, on November 28, 2016, the City of Palo Alto approved the S/CAP Framework, Principals, and Guidelines, which establishes goals and strategies to achieve the City's GHG reduction goal for reducing Palo Alto's GHG emissions to 80 percent below 1990 levels by 2030 ("80x30"), 20 years ahead of the State of California "80x50" target. While implementation plans are still being prepared, it is expected that the final S/CAP will complement the Comprehensive Plan Update and identify specific actions necessary to achieve the City's goal. Because the two plans will clearly achieve or exceed the State's goals for 2030, the impact would be less than significant for all six scenarios and no mitigation is required. Mitigation Measure GHG-2 has been deleted because the City has approved the S/CAP Framework, Principals, and Guidelines, which establishes goals and strategies to achieve "80x30" and no significant impacts related to consistency with GHG reduction plans are identified.

~~**Mitigation Measure GHG-2:** To ensure that Palo Alto's GHG emissions are reduced consistent with the State's long-term goals, the proposed Plan should contain the following policy and program, or equally effective language, articulating these goals and ensuring steady progress towards their achievement:~~

- ~~▪ **Policy:** Strive to achieve and exceed target reductions in greenhouse gas emission levels set forth by Executive Order S-03-05.~~
- ~~▪ **Program:** Adopt an updated GHG emission reduction plan as part of the S/CAP aimed at achieving or exceeding the State's goals, and monitor the City's progress on an annual basis.~~

~~GHG reduction policies included in the S/CAP, which is being prepared in conjunction with proposed Plan, would ensure substantial progress toward the long-term GHG reduction goals of Executive Order S-03-05. However, at this time, additional State and federal actions, as well as advances in technology, are necessary to achieve the deep cuts required to meet the 2050 emissions target. These actions are beyond the jurisdiction of the City of Palo Alto and therefore it is unclear whether the City alone can mitigate this impact to a less than significant level.~~

### CARB's Scoping Plan

In accordance with AB 32, CARB developed the *2008 Scoping Plan* to outline the State's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions (i.e., GHG emissions in the absence of statewide emission reduction measures). CARB identified that the State as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32.<sup>21</sup> The GHG emissions forecast was updated as part of the First Update to the Scoping Plan. In the First Update to the Scoping Plan, CARB projected that statewide BAU emissions in 2020 would be approximately 509 million MTCO<sub>2</sub>e.<sup>22</sup> Therefore, to achieve the AB 32 target of

<sup>21</sup> California Air Resources Board, 2008, *Climate Change Proposed Scoping Plan, a Framework for Change*.

<sup>22</sup> The BAU forecast includes GHG reductions from Pavley and the 33% Renewable Portfolio Standard.

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431 million MTCO<sub>2</sub>e (i.e., 1990 emissions levels) by 2020, the State would need to reduce emissions by 78 million MTCO<sub>2</sub>e compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020.<sup>23,24</sup>

As described in the February 2016 Draft EIR, several statewide strategies to reduce GHG emissions are identified in the *2008 Scoping Plan* and would ensure the State is on target to achieve the GHG emissions reduction goals of AB 32. Statewide GHG emissions reduction measures that are being implemented would apply to future development and vehicle travel allowed under the updated Comp Plan and would therefore reduce the City's future GHG emissions. As described in the *2014 First Update to the Scoping Plan*, as California continues to build its climate policy framework, there is a need for local government climate action planning to adopt mid-term and long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050. CARB identifies that local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals.

CARB is also in the process of preparing a *2030 Target Scoping Plan Update* to address the new interim GHG reduction target for 2030 under SB 32 of 40 percent below 1990 levels, which is anticipated to be released in 2017. The *2030 Target Scoping Plan update* will focus on statewide strategies to achieve the GHG reductions for year 2030 required under SB 32, which are a 40 percent reduction from 1990 levels. There is no legislative target or plans being prepared to address the GHG reductions needed to achieve the long-term GHG goal for 2050 identified in Executive Order S-03-05 because it is not a State legislative target. Consequently, consistency with statewide GHG reduction strategies focuses on consistency with plans adopted to achieve the legislative target for year 2020 established under AB 32 and outlined in the Scoping Plan.

On November 28, 2016, the City of Palo Alto approved the S/CAP Framework, Principals, and Guidelines, which establishes goals and strategies to achieve the City's GHG reduction goal for reducing Palo Alto's GHG emissions to 80 percent below 1990 levels by 2030 ("80x30"), 20 years ahead of the State of California "80x50" target. The draft measures being considered for inclusion in the S/CAP to reduce emissions are listed in the February 2016 Draft EIR and include measures to expand bicycle and transit infrastructure and services, utilize parking strategies, convert to electric vehicles, electrify heating and cooking systems, and eliminate natural gas usage in new construction. Additional strategies incorporated into the S/CAP since the February 2016 Draft EIR include:

- Development of a Carbon Neutral Natural Gas strategy (which moves City the next step along the trajectory from Carbon Neutral Electricity to Carbon Neutral Utility to Carbon Neutral City).<sup>25</sup>

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<sup>23</sup> California Air Resources Board, 2014. *First Update to the Climate Change Scoping Plan: Building on the Framework, Pursuant to AB 32, The California Global Warming Solutions Act of 2006*.

<sup>24</sup> If the GHG emissions reductions from Pavley I and the Renewable Electricity Standard are accounted for as part of the BAU scenario (30 million MTCO<sub>2</sub>e total), then the State would need to reduce emissions by 108 million MTCO<sub>2</sub>e, which is a 20 percent reduction from BAU.

<sup>25</sup> On December 5, 2016, the Palo Alto City Council's took additional action on development of a Carbon Neutral Gas strategy for Palo Alto Utilities by deciding to offset all natural gas emissions and directing staff to develop strategies to reduce actual natural gas use.

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- Adoption of an advanced Green Building Ordinance and Energy Reach Code.
- Continued analysis of electrification options.
- Exploration of Zero Net Energy buildings and districts.<sup>26</sup>

The proposed Plan and S/CAP are being prepared in parallel and address issues related to sustainability including reducing GHG emissions from single-occupant vehicles, conserving energy, water, and other natural resources. While the proposed Plan provides the broad policy framework for the City’s sustainability objectives, the S/CAP outlines strategies for reducing GHG emissions through the proposed Plan Horizon year and beyond. The proposed Plan and concurrent preparation of the S/CAP support substantial progress toward the State’s GHG reduction goals, and the City is on track to meet State goals for reducing GHG emissions to 40 percent below 1990 levels by 2030 as all scenarios would achieve the 2030 efficiency threshold and implementation of the proposed Plan would not conflict with the *Scoping Plan*.

### MTC’s Plan Bay Area

*Plan Bay Area* is the Bay Area’s SCS, adopted to reduce GHG emissions from land use and transportation, as required by SB 375. The Plan Bay Area land use concept plan for the region concentrates the majority of new population and employment growth in the region in locally-designated Priority Development Areas (PDAs). In Palo Alto, Plan Bay Area includes the Palo Alto California Avenue Transit Neighborhood PDA, which is envisioned as a vibrant, pedestrian-oriented neighborhood with a diversity of uses that supports the economic vitality of California Avenue and nearby businesses while encouraging the use of public transportation and other non-vehicular transportation modes. All proposed Plan scenarios would encourage development consistent with the goals and objectives for this PDA because all would maintain the existing Pedestrian and Transit Oriented Development (PTOD) zoning.

The proposed Plan also includes policies and strategies that, once adopted, would reduce GHG emissions from transportation sources to the maximum extent practicable. The proposed Plan includes the following Sustainability Initiatives that would reduce GHG emissions from transportation sources:

- Paid transit passes for employees in workplaces with over 50 employees (or alternative employee commuter benefit, consistent with BAAQMD Regulation 14, Rule 1) (all scenarios).
- Employer incentives for carpooling and bicycling (Scenarios 2 through 6).
- Unbundled parking costs for multi-family units (Scenarios 3 through 6).
- Parking charges for workplaces with over 50 employees (Scenarios 4 through 6).
- Paid parking in Downtown and California Avenue areas (Scenarios 4 through 6).
- Free transit passes for all Palo Alto residents in transit-accessible areas (Scenarios 4 through 6).

<sup>26</sup> Palo Alto, City of. 2016. Sustainability and Climate Action Plan, Framework, Principals, Guidelines, Goals, and Strategies, November.

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These strategies, which encourage use of alternative modes of transportation, would strengthen support for future development within Palo Alto's PDA, consistent with the objectives of *Plan Bay Area*. Therefore, all scenarios would be consistent with the land use concept plan for Palo Alto that is identified in *Plan Bay Area*.

### Conclusion

The City of Palo Alto is projected to achieve the interim GHG emissions reduction target of 40 percent below 1990 levels by 2030. Additionally, implementation of the City's Comprehensive Plan and S/CAP, ensures that the City is consistent with the State Scoping Plan and ABAG/MTC's Plan Bay Area. Therefore, GHG impacts for consistency with plans adopted for the purpose of reducing GHG emissions are *less than significant*.

### Applicable Regulations:

- California Global Warming Solutions Act (AB 32)
- California Global Warming Solutions Act 2030 Emissions Limit (SB 32)
- Sustainable Communities and Climate Protection Act (SB 375)
- Greenhouse Gas Emission Reduction Targets (Executive Order S-3-05)
- Clean Car Standards – Pavley (AB 1493)
- Renewable Portfolio Standards (SB 1078)
- Clean Energy and Pollution Reduction Act of 2015 (SB350)
- California Integrated Waste Management Act of 1989 (AB 939)
- California Mandatory Commercial Recycling Law (AB 341)
- California Advanced Clean Cars CARB/ Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure (Title 17 CCR)
- Low Carbon Fuel Standard (Title 17 CCR)
- California Water Conservation in Landscaping Act of 2006 (AB 1881)
- California Water Conservation Act of 2009 (SBX7-7)
- Statewide Retail Provider Emissions Performance Standards (SB 1368)
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

**Significance before Mitigation:** The City of Palo Alto is projected to achieve the interim GHG emissions reduction target of 40 percent below 1990 levels by 2030 as all scenarios would achieve the 2030 efficiency metric. Additionally, implementation of the City's Comprehensive Plan and S/CAP would ensure that the City is consistent with the State *Scoping Plan* and ABAG/MTC's *Plan Bay Area* and is working to

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achieve a 2030 emissions reduction target more aggressive than the State. Therefore, GHG impacts for consistency with plans adopted for the purpose of reducing GHG emissions are less than significant.

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**GHG-3**      **The proposed Plan would expose people or structures to the physical effects of climate change, including but not limited to flooding, extreme temperatures, public health, wildfire risk, or other impacts resulting from climate change, requiring mitigation. (Significant and Mitigable – All Six Scenarios)**

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*February 2016 Draft EIR Findings:* Significant for Scenarios 1 through 4, requiring mitigation. Mitigation Measure GHG-3 would apply to all four scenarios but would not reduce the impact to a less-than-significant level. Therefore, the impact would be significant and unavoidable.

*Summary of Supplemental Analysis:* The February 2016 Draft EIR identified a significant and unavoidable impact for Scenarios 1 through 4. The February 2016 Draft EIR identified that Mitigation Measure GHG-3 would apply to all four scenarios but would not reduce the impact to a less-than-significant level. The analysis in this section has been revised to acknowledge that, through Mitigation Measure GHG-3, the City's response to the impacts of climate change for new development would provide a strong framework for climate change resiliency and would reduce impacts to the extent feasible. This Supplement to the Draft EIR finds that the impact would be less than significant for all six scenarios after mitigation. In addition, Mitigation Measure GHG-3 has been revised, as shown below. These revisions will also be applied to the mitigation for Scenarios 1 through 4. The revisions do not change the original intent or effectiveness of Mitigation Measure GHG-3.

**Mitigation Measure GHG-3:** To address the potential impacts associated with exposing additional people or structures to the effects of climate change, the proposed Plan ~~should~~ shall include the following policies and programs, or equally effective language, to ensure that future development would address potential risks and that the City would work with other agencies to coordinate strategies for minimizing risk, ensuring appropriate response/recovery, and planning for resiliency that address the following topics:

- Flooding risks caused by climate change-related changes to precipitation patterns, groundwater levels, sea level rise, tides, and storm surges.
- Cooperative planning with federal, State, regional, and local public agencies on issues related to climate change (including sea level rise and extreme storms).
- Preparation of response strategies to address sea level rise, increased flooding, landslides, soil erosion, storm events, and other events related to climate change.
- Impacts of sea level rise on Palo Alto's levee system.

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- Policy: Monitor and respond to the risk of flooding caused by climate change that may result in changes to precipitation patterns, sea level rise, and storm surges.
- Policy: Promote and participate in cooperative planning with other public agencies and regional and adjacent jurisdictions, especially regarding issues related to climate change, such as water supply, sea level rise, fire protection services, emergency medical services, and emergency response planning.
- Program: Develop and implement “green infrastructure” practices to mitigate flooding through improved permeability or paved areas, and storm water capture and storage.
- Program: Regularly coordinate with regional, State, and federal agencies on rising sea levels in the San Francisco Bay and major tributaries to determine if additional adaptation strategies should be adopted to address flooding hazards from increased sea levels for existing or new development and infrastructure. This includes monitoring Federal Emergency Management Agency flood map updates to identify areas in the city susceptible to sea level rise, addressing changes to State and regional sea and bay level rise estimates, and coordinating with adjacent municipalities on flood control improvements as appropriate.
- Program: Prepare response strategies that address sea level rise and increased flooding, and other events related to climate change, such as increased flooding, landslides, soil erosion, wildfires, and storm events. Include response strategies to address sea level rise on Palo Alto’s levee system.
- Program: Develop new development requirements for shoreline development to ensure that new development is designed and located to provide protection from potential impacts of flooding resulting from sea level rise and significant flood events. Requirements may include: new setbacks to ensure structures are set back far enough inland that they will not be endangered by erosion; limits on subdivisions and lot line adjustments in areas vulnerable to sea level rise to avoid the creation of new shoreline lots; incentive or transfer of development rights (TDR) programs to relocate existing development away from high risk areas; and/or triggers for relocation or removal of existing structures based on changing site conditions and other factors.

Pursuant to the December 2015 ruling in the *California Building Industry Association (CBIA) v BAAQMD*, impacts of the environment on the project are not considered impacts under CEQA. However, this analysis has been incorporated into the environmental assessment in order for the City to consider potential health and welfare implications from siting future development in areas that could be affected by climate change in the future. The proposed Plan would have a significant impact if it would allow future development that would expose people or structures to the physical effects of climate change, such as flooding associated with sea level rise, inundation due to levee failure, extreme weather events (such as intensified droughts, heat waves, and storms), increased wildfire threats, and landslides.

As described in Section 4.6.1.2, *Potential Climate Change Impacts for California and Palo Alto*, in the February 2016 Draft EIR, climate change is expected to cause global sea levels to rise three to six feet by the year

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2100, with sea level rise of up to 69 inches along the San Francisco Bay.<sup>27,28</sup> Data on sea level rise is evolving and BCDC uses the 55-inch sea level rise scenario in the Bay Plan when assessing long-term impacts. Rising sea levels pose a significant threat to Palo Alto due to the increased risk of inundation of critical structures located in a floodplain and along the shoreline. As shown on Figure 4.8-4 in the February 2016 Draft EIR, virtually all of Palo Alto east of Middlefield Road and south of Embarcadero Road is vulnerable to sea level rise under a 55-inch scenario, suggesting the need for major investments in levees or other strategies over the next several generations, as well as increased development restrictions and relocation of critical infrastructure. All six scenarios would allow for job growth in existing employment districts located along East Bayshore and East Meadow Circle, although job growth in these areas would be more modest under Scenarios 5 and 6 than under Scenarios 1 through 4. Development allowed under these scenarios could significantly increase the amount of people that are present at these locations at any given time, thus exposing them to potential flooding hazards. All six scenarios would allow redevelopment throughout the city, including in areas subject to inundation associated with sea level rise, which would expose new structures, residents, and workers to potential flooding hazards that could be exacerbated by climate change.

Climate change is also likely to contribute to diminished air quality, thereby negatively impacting public health in Palo Alto. As described in Section 4.6.1.2, in the February 2016 Draft EIR, climate change is expected to exacerbate air pollution by increasing the frequency, duration, and intensity of conditions that lead to air pollution formation. As described in Chapter 4.2, Air Quality, all six scenarios would allow development and redevelopment throughout the city, which could site sensitive receptors in areas that exceed ozone or particulate matter air quality standards. Therefore, all six scenarios would expose new structures, residents, and workers to potential public health risks associated with air pollution that could be exacerbated by climate change.

As described in Section 4.6.1.2, in the February 2016 Draft EIR, climate change is expected to significantly alter rainfall distribution and intensity, resulting in fewer but more intense rainfall events followed by prolonged dry periods. This could result in flooding and inundation events during the brief rainy season and intensified drought conditions between precipitation events. Wildfire risks will be addressed in the proposed Plan under all six scenarios in compliance with Government Code Section 65302.5(b). All six scenarios would allow development and redevelopment throughout the city, including in areas near undeveloped open space and in the 100-year flood plain, which would expose new structures, residents, and workers to potential storm and drought hazards that would be exacerbated by climate change.

Despite existing plans and studies that have examined potential climate change impacts for Palo Alto and the surrounding region and plan for ways to address related hazards, all six scenarios would allow development

<sup>27</sup> The Intergovernmental Panel on Climate Change, Fourth Assessment Report: Climate Change 2007: The AR4 Synthesis Report, Geneva: IPCC.

<sup>28</sup> San Francisco Bay Conservation and Development Commission, *Resolution No. 11-08: Adoption of Bay Plan Amendment Adding New Climate Change Findings and Policies to the Bay Plan*.

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and redevelopment throughout the EIR Study Area that could expose people and structures to the effects of climate change described above. Therefore, Scenarios 5 and 6 would have a *significant* impact.

### Applicable Regulations:

- Association of Bay Area Governments' Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area
- Santa Clara County Local Hazard Mitigation Plan
- City of Palo Alto Local Hazard Mitigation Plan

**Significance before Mitigation:** Development assumed during the life of the proposed Plan would add to the population (residents and employees and others) that could be exposed to the effects of climate change. For this reason, Impact GHG-3 is considered *significant*, requiring mitigation.

### Mitigation Measures

**Mitigation Measure GHG-3** would apply to Scenarios 5 and 6.

**Significance after Mitigation:** Less than Significant. Compliance with the proposed Plan policies that address the topics listed in Mitigation Measure GHG-3 would ensure that the City reviews new development and requires project design features to reduce the impact from flooding, sea level rise, and other effects of climate change anticipated in the EIR Study Area.

Analysis conducted to understand the effect of implementing mitigation measures shows that review of projects for climate change risks through implementation of Mitigation Measure GHG-3 would reduce potential hazards to new development to the extent feasible.

## 4.6.4 CUMULATIVE IMPACTS

The analyses in Impacts GHG-1 and GHG-2 assess the potential GHG emissions impact of the proposed Plan on a cumulative level and are not discussed further here.

For cumulative impacts associated with the physical effects of climate change evaluated under Impact GHG-3, Scenarios 5 and 6 would have a significant cumulative impact if, along with other projects in the Bay Area region, it would allow future development that would expose people or structures to the physical effects of climate change, such as flooding associated with sea level rise, inundation due to dam or levee failure, extreme weather events (such as intensified droughts, heat waves, and storms), increased wildfire threats, and landslides.

Impact GHG-3 describes the ways in which future development and redevelopment allowed by the proposed Plan would expose people and structures to increased hazards associated with climate change. Cumulative development in Santa Clara County and the Bay Area region would also expose people and structures to these same effects.



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Existing plans and studies, such as ABAG's *Multi-Jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area*, address climate change and plan for its potential effects. With the implementation of Mitigation Measure GHG-3, the City would take feasible steps to respond to the effects of climate change. With Mitigation Measure GHG-3, the Comp Plan would minimize the extent to which future development and redevelopment within Palo Alto would contribute to impacts associated with climate change effects throughout the region would expose people and structures to the effects of climate change described above. Therefore, all six scenarios, including Scenarios 5 and 6, would result in a *less-than-significant* cumulative impact.

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