



# Sunnyvale Climate Action Plan

## Biennial Progress Report – 2016



This page intentionally left blank.

# TABLE OF CONTENTS

## Executive Summary

## Chapter 1: Introduction

1.1. Purpose and Scope.....	1
1.2. Updates in Regulatory Context.....	2

## Chapter 2: Greenhouse Gas Inventory for 2014

2.1. Community-wide GHG Inventory.....	7
2.2. Municipal GHG Inventory .....	19

## Chapter 3: Climate Action Plan Implementation for 2014-2015

3.1. CAP Implementation Results 2014-2015.....	23
3.2. Key Initiatives “In Progress” in 2014 and 2015.....	31
3.3. Updates to GHG Reduction Estimates .....	34
3.4. Proposed Revisions to Climate Action Plan .....	38

## Chapter 4: Future CAP Implementation

4.1. Key Initiatives for Next Biennial Reporting Cycle.....	45
4.2. Revisions to CAP Work Plan 2020 .....	49
4.3. Updates to Funding Strategies .....	50

## Figures

<i>Figure ES-1. 2014 Emissions relative to 2008 Baseline and State-recommended Targets .....</i>	<i>vi</i>
<i>Figure 2-1. 2008 Community-wide Emissions.....</i>	<i>8</i>
<i>Figure 2-2. GHG Emissions and Activity Data by Sector .....</i>	<i>10</i>
<i>Figure 2-3. Cross-sector Comparison of 2014 Inventory to Baseline.....</i>	<i>12</i>
<i>Figure 2-4. Influence of Community Activity vs. Emissions Factors on Total Emissions from Residential Electricity Use.....</i>	<i>15</i>
<i>Figure 2-5. GHG Emissions Relative to Targets .....</i>	<i>18</i>
<i>Figure 2-6. Sunnyvale Landfill GHG Emissions Compared to Remaining City's GHG Emissions .....</i>	<i>20</i>

## Tables

<i>Table 2-1. Sunnyvale Characteristics .....</i>	<i>8</i>
<i>Table 2-2. Original and Updated 2008 Baseline Inventory by Sector .....</i>	<i>11</i>
<i>Table 2-3. Activity Data and Emissions in 2014 vs. 2008 Baseline.....</i>	<i>13</i>
<i>Table 2-4. Sunnyvale's Government Operations Operational GHG Emissions by Sector and Scope .....</i>	<i>19</i>
<i>Table 3-1. Implementation Status of CAP Actions by Goal Area .....</i>	<i>25</i>
<i>Table 3-2. Emissions Reductions from Local CAP Implementation Efforts 2014-2015, by Goal Category.....</i>	<i>26</i>
<i>Table 3-3. Impacts of Baseline, Forecast, and Reduction Measure Updates to GHG Emissions, 2020 and 2035.....</i>	<i>37</i>
<i>Table 3-4. Proposed Revisions to CAP Actions.....</i>	<i>39</i>
<i>Table 3-5. Estimated 2020 Changes in Emissions Reductions from Proposed Action Changes.....</i>	<i>44</i>
<i>Table 4-1. Reduction Measures to be evaluated with next Green Building Program Update.....</i>	<i>46</i>

Table 4-2. Study Items identified in the CAP Workplan ..... 48

Table 4-3. Potential Grant Opportunities from Cap and Trade Revenue..... 52

Appendices

Appendix A: Revised CAP Implementation Work Plan 2020



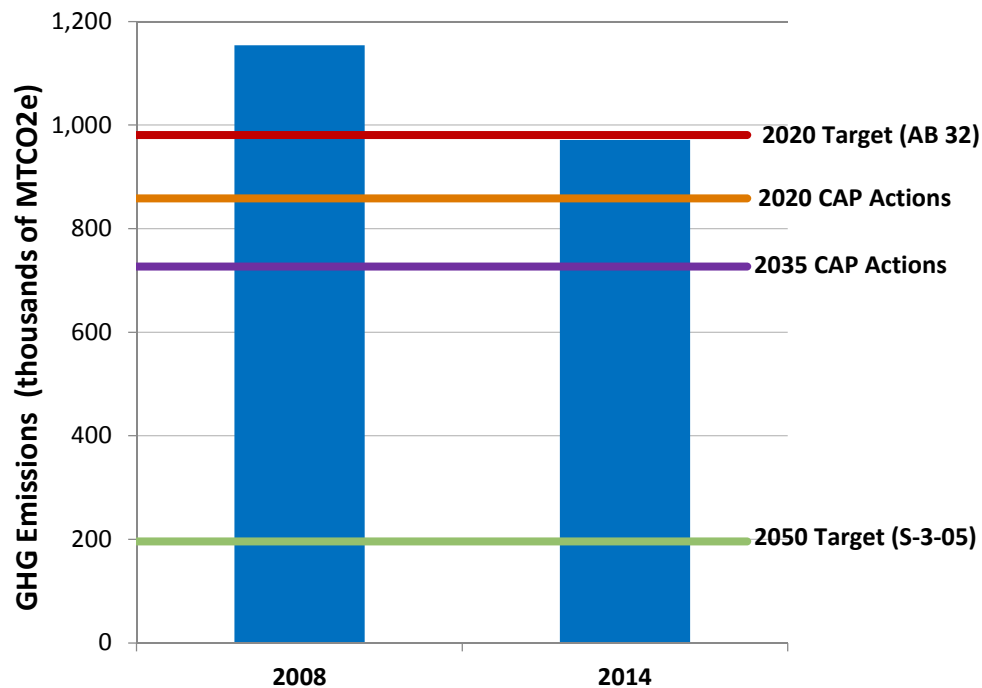
# Executive Summary

The City of Sunnyvale's Climate Action Plan (CAP), adopted in May 2014, outlines the City's path toward mitigating climate change, while fostering a sustainable, healthy, and livable community. It establishes the City's baseline greenhouse gas (GHG) emissions for 2008 and identifies mitigation strategies and their corresponding emissions reductions. The City of Sunnyvale is striving to achieve recommended reduction targets of 15% below baseline levels by the year 2020 (equivalent to 1990 levels) and 80% below 1990 levels by the year 2050, as recommended by the State of California. Full implementation of the CAP is designed to achieve GHG reductions of 26% below 2008 levels by year 2020 and 37% below 2008 levels by year 2035.

The CAP Work Plan 2020, adopted in November 2014, identifies a timeline for implementation of the CAP measures in the "near" and "mid" terms to reach the 2020 emissions target. The CAP Work Plan 2020 specifies a cycle for biennial monitoring reports that summarize CAP implementation progress, update the City's GHG emissions inventories, and provide a revised outlook for CAP measures to be implemented in the upcoming two-year period.

This CAP Biennial Progress Report 2016 is the first monitoring report since the adoption of the CAP in 2014. It includes GHG emissions inventories for calendar year 2014, information on the status of CAP implementation and corresponding GHG reductions since the 2008 baseline, recommended modifications to selected CAP actions, and a revised work plan for continuing CAP implementation during the next two-year implementation cycle.

For 2014, Sunnyvale's community-wide emissions totaled 971,140 metric tons of carbon dioxide equivalents (MTCO<sub>2</sub>e) and were 15.8% lower than the baseline 2008 emissions of 1,153,970 MTCO<sub>2</sub>e. This represents a reduction in emissions in line with the state recommend target of reducing emissions by 15% by 2020, per Assembly Bill 32 (AB 32) (Figure ES-1).



**Figure ES-1. 2014 Emissions relative 2008 Baseline and State-recommended Targets**

Emissions were lower in 2014 due to lower emissions factors as well as due to changes in community-wide activities. Noteworthy trends that influenced the City's emissions include: reductions in residential electricity and natural gas use; relatively stable commercial energy use despite increases in development; a reduction in PG&E's electricity emissions factor; and an increase in vehicle miles traveled (VMT) within the City. The City's municipal emissions, which are a subset of the community-wide emissions, totaled 23,970 MTCO<sub>2</sub>e.

The CAP identifies 129 actions that range in scope and resources required. Of these, 74 actions (57%) were completed or were ongoing implementation during 2014 and 2015. CAP implementation efforts were associated with an estimated cumulative reduction of 21,470 MTCO<sub>2</sub>e, based on the subset of these actions that can be quantified with reasonable reliability. Key accomplishments achieved between 2008 and 2014 include:

- 64% solid waste diversion rate
- Commercial energy use remained more or less the same while commercial floor area increased
- 25% reduction in water use



- 41% students using non-motorized transport to school
- CalTrain ridership increased 45%

In addition, significant levels of staff effort and resources have been directed at the 20 CAP actions that are still in progress and under development, including Community Choice Energy (CCE), residential energy efficiency and conservation, conversion of remaining City-owned streetlights to LEDs, and Transportation Demand Management efforts.

The CAP Work Plan 2020 provides a revised implementation outlook for the next biennial implementation cycle (calendar years 2016 and 2017). Priorities expected to involve considerable resources from implementing City departments during the next two-year implementation period include updates to the City's CalGreen and Green Building policies, commercial energy conservation programs, climate adaptation planning and preparation, and additional study items.

Due to the limited implementation period since the adoption of the CAP and recognizing there are significant actions that are in progress and not yet resulting in GHG reductions reflected in the community inventory or local implementation tracking, staff is not recommending substantial changes to the CAP at this time. As a result, the limited recommended changes to CAP actions are based on operational experience, changes or advances in technology, and changes in regulatory climate. It is not expected that these recommended changes will affect Sunnyvale's ability to meet or exceed the GHG reduction targets contained in the CAP. The CAP will be updated to reflect these changes, pending approval and any additional direction from City Council.



# 1 – Introduction

## 1.1. Purpose and Scope

In May 2014, the Sunnyvale City Council adopted the Climate Action Plan (CAP), which outlines the City's path toward mitigating climate change, while fostering a sustainable, healthy, and livable community. Like other cities in California, the City of Sunnyvale is striving to achieve the recommended greenhouse gas reduction targets established by Governor Arnold Schwarzenegger's Executive Order S-3-05 in 2005 of 15% below baseline emissions by the year 2020 (equivalent to 1990 levels) and an emissions reduction of 80% below 1990 emissions levels by 2050. The 2020 GHG emission reduction target was subsequently included in the California Global Warming Solutions Act of 2006 (Assembly Bill 32).

Sunnyvale's adopted CAP summarizes sources of greenhouse gas (GHG) emissions in Sunnyvale as of 2008 (baseline year) and projections of anticipated emissions under future growth scenarios. The CAP identifies mitigation strategies and their corresponding emissions reductions. CAP strategies, if implemented as planned, would position the City to exceed the GHG emissions targets for the year 2020 and make progress towards the 2050 target.



In November 2014, the City Council adopted the CAP Work Plan 2020 (Work Plan 2020), which identifies a timeline, current status, and key steps for implementation of the CAP measures in the “near” and “mid” terms. CAP Work Plan 2020 specifies that the City will provide biennial monitoring reports summarizing CAP implementation progress, updates to the City’s GHG inventories, and a revised outlook for CAP measures to be implemented in the upcoming two-year period, including an update on funding for CAP implementation.

This CAP Monitoring Biennial Report 2016 is the first report on CAP implementation and is the first update the City’s GHG emissions inventories since the initial development of the CAP. This report provides information on the status of CAP implementation and corresponding GHG reductions since the 2008 baseline, recommends modifications to selected CAP actions and performance indicators (based on recent policy or financial changes, new technologies, or implementation findings), and outlines a work plan (including information on available funding) for continuing CAP implementation during the next two-year implementation cycle (calendar years 2016 and 2017).

This report is divided into the following chapters:

- Background on changes in the regulatory context since the CAP was adopted (Introduction – Chapter 1);
- Community-wide and municipal GHG emissions inventories for 2014, including comparisons to and adjustments to the 2008 baseline (Chapter 2);
- Status of CAP implementation and associated GHG reductions, updates to GHG reductions from CAP implementation, and proposed revisions to the CAP (Chapter 3); and
- Path to implementing CAP measures prior to 2018 biennial report and in the near-term by 2020 (Chapter 4).
- Revised CAP Implementation Work Plan 2020 (Appendix A).

## 1.2. Updates in Regulatory Context

Since the CAP was adopted in May 2014, the regulatory framework for reducing greenhouse gas (GHG) emissions has continued to evolve. Changes at the federal, state, and local levels may directly affect Sunnyvale’s GHG emissions, leading to further regulatory actions on issues of climate change, or additional

work to address vulnerability to climate-related hazards. Not all of these actions are directly applicable to Sunnyvale or create additional requirements for the City, but all are expected to have some effect on how the City addresses climate change going forward.

### 1.2.1. Federal Regulations

#### *Clean Power Plan*

On August 3, 2015, the US Environmental Protection Agency (EPA) issued a new regulation called the Clean Power Plan, intended to reduce GHG emissions from existing power plants. The Clean Power Plan sets targets for individual states and allows the states to choose how best to achieve these targets through a combination of improved efficiencies in power plants, energy use efficiency, and increased renewable energy generation. The new rule relies on the EPA's authority to regulate GHG emissions under the Clean Air Act without any new legislation, as described in the CAP. California has a choice of two GHG reductions targets for electricity generation: an average of 828 pounds of carbon dioxide per megawatt-hour (MWh) of electricity generated, or a total of approximately 48.4 million tons of carbon dioxide from all power plants. These targets are for 2030, with incremental targets starting in 2022. It is not yet known which target the state will choose, or whether existing programs, such as Cap and Trade and Renewable Portfolio Standards (RPS), will be sufficient to meet the Clean Power Plan goals. In accordance with the rule, California will submit a compliance plan by September 2016, describing how the state will meet the rule's targets.

### 1.2.2. State Regulations

#### *Assembly Bill 32 Scoping Plan Update*

In 2006, California adopted Assembly Bill (AB) 32, the California Global Warming Solutions Act, which set statewide targets for GHG reductions and tasked the California Air Resources Board (CARB) with developing the regulatory and market mechanisms to achieve these reductions. AB 32 also requires CARB to prepare a Scoping Plan, outlining how the state will meet its GHG reduction goals in a technologically and economically feasible manner.

The Scoping Plan must be updated at least once every five years. CARB adopted its first major update to the Scoping Plan on May 22, 2014. This updated document includes a summary of the expected impacts of climate change to the state, the levels of GHG reductions necessary to avoid risking serious and



irreparable damage, the actions California has already taken to decrease emissions, and opportunities to achieve further reductions to meet the AB 32 reduction goals. The updated plan describes various state programs which have been completed or ongoing, including items integrated into the CAP such as RPS, vehicle fuel efficiency standards, increased use of electric vehicles, and water conservation efforts. The updated Scoping Plan also looks beyond 2020 to potential long-range targets for statewide GHG reductions. It does not establish or recommend any specific post-2020 reductions goal, but identifies goals that have been adopted by other governments or recommended by various scientific and policy organizations.

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

Executive Order B-30-15, issued by Governor Brown on April 29, 2015, calls on state agencies to reduce California's GHG emissions to 40% below 1990 levels by 2030. It also emphasizes the risk that climate change poses to California and directs a number of state agencies to take action on GHG reduction and climate adaptation strategies, including requiring CARB to update the AB 32 Scoping Plan to include a discussion of the 2030 target. The draft updated Scoping Plan is scheduled to be released in the spring of 2016, and is set to be adopted by CARB in fall of 2016. It is not yet known if this second update to the Scoping Plan will create any requirements for local governments and related CAPs.

Executive orders do not have the effect of new laws, and can only enforce existing ones. Moreover, they only apply to state agencies, not local or regional government agencies. The provisions of Executive Order B-30-15 have not been codified into law at this time.

### *Senate Bill 350*

Senate Bill (SB) 350 was signed into law on October 17, 2015, and strengthens California's RPS. Prior to SB 350, public and private utilities in California were required to obtain at least 33% of their electricity from eligible renewable sources by 2020. SB 350 maintains this requirement and creates a new one that requires all utilities to obtain at least 50% of their electricity from eligible renewable sources by 2030. SB 350 and the RPS program do not create any new requirements for cities, like



Sunnyvale. However, the anticipated increase in the RPS for Pacific Gas & Electric (PG&E), the current utility provider for Sunnyvale, is expected to reduce Sunnyvale's 2035 GHG emissions by approximately 114,270 MTCO<sub>2</sub>e (see section 3.2.1 for further details on PG&E's anticipated RPS achievements).

### **Senate Bill 379**

SB 379, signed into law on October 8, 2015, requires local hazard mitigation plans (LHMPs) to address climate change adaptation and resiliency. Any LHMP updated on or after January 1, 2017 (or an LHMP adopted on or after January 1, 2022, for communities that do not already have an LHMP), must identify the risks that climate change poses to the community, identify the areas of the community at risk, and include strategies to reduce these risks.

In lieu of a city-specific LHMP, the City of Sunnyvale participates in the development of a multi-jurisdictional local hazard mitigation plan for the San Francisco Bay Area. This regional plan is a collaborative effort between cities, counties, and special districts in the Bay Area, and the Association of Bay Area Governments (ABAG) and most recent version was adopted in 2011. Local community-specific priorities are identified in Annexes to this plan developed by individual Bay Area communities, including the City of Sunnyvale (ABAG 2011).

The 2011 multi-jurisdictional hazard mitigation plan identifies nine key hazards, including climate change, faced by Bay Area communities, their associated risks, and strategies to address them. It includes a qualitative assessment of exposure and vulnerability of Bay Area communities to sea-level rise and also recognizes climate change as a notable influence on weather-related hazards.

The plan is scheduled to be updated every five years (ABAG 2011). As of 2016, the City's Office of Emergency Services is working through the collaborative on the next update to the multi-jurisdictional plan. Although the City's Annex to the plan does not specifically address climate change, it recognizes that climate change may be a contributing factor to other potential hazards. This and future updates to the multi-jurisdictional plan will likely comply with SB 379.

### **Senate Bill 246**

SB 246 was signed into law on October 8, 2015, and establishes an Integrated Climate Adaptation and Resiliency Program in the Governor's Office of Planning and Research (OPR). Under SB 246, the Program is responsible for coordinating state, regional, and local climate change adaptation efforts to create a consistent and unified adaptation response for California. The program and other state agencies are required to update California's Adaptation Planning Guide

document to assist local governments with climate adaptation planning efforts. SB 246 also requires OPR to prepare and regularly update a clearinghouse of climate adaptation data. While local communities have no direct responsibilities under SB 246, the Program will create key resources to support local adaptation planning efforts.

### *General Plan Guidelines Update*

All cities and counties in California are required to prepare and update a General plan document for the community, which serves as a long-term blueprint for future growth. General plans are prepared in accordance with guidelines issued by OPR. In October 2015, OPR released a draft version of the updated General Plan Guidelines.



The final version is anticipated to be completed in early 2016. Resilience is a central theme of the new Guidelines, which provide extensive recommendations for how to address climate change in a General Plan. The Guidelines themselves do not create any statutory requirements for local communities, although they do provide guidance on how to comply with adopted laws related to general plans.

### **1.2.3. Local Regulations**

#### *Land Use and Transportation Element*

The Sunnyvale Land Use and Transportation Element (LUTE) is part of the City's General Plan. The City is currently in the process of updating the LUTE, using 2014 as the baseline year. It establishes the framework of how the community will be laid out, and how land uses, development projects, and transportation facilities and infrastructure will function together. The land use and transportation-related policies in the LUTE provide direction for how Sunnyvale will grow and change through 2035, including where new development will occur. These policies will affect Sunnyvale's GHG emissions from transportation-related activities, and have a limited impact on GHG emissions from other sectors. After the updated LUTE is adopted, the CAP will need to be updated to reflect these changes to transportation-related emissions.



# 2 – Greenhouse Gas Inventory for 2014

## 2.1. Community-wide GHG Inventory

### 2.1.1 Background

In 2010, the City of Sunnyvale developed its first community-wide greenhouse gas (GHG) inventory in conjunction with the development of the CAP (it is the first component of a Qualified GHG Reduction Strategy). Sunnyvale's initial community inventory utilized a baseline year of 2008 to inventory carbon dioxide, nitrous oxide, and methane generated from activities by the Sunnyvale community. The City's 2008 GHG inventory was guided by the Bay Area Air Quality Management District's (BAAQMD) California Environmental Quality Act (CEQA) Air Quality Guidelines, adopted in June 2010 and updated in October 2011. Following these guidelines, the following sources of emissions were used to developing Sunnyvale's inventory:

- Commercial and industrial energy (natural gas and electricity, including direct access)
- On-road transportation (diesel and gasoline use from on-road vehicles)
- Residential energy (natural gas and electricity)
- Off-road equipment and vehicles (lawn and garden equipment, construction vehicles and equipment)
- Waste (direct landfill emissions, emissions from community waste)
- Water (wastewater treatment, energy for treatment and distribution)
- Caltrain transit (GHG emissions from the use of Caltrain to and from Sunnyvale)

The 2008 inventory tracked emissions from seven key source sectors (**Figure 2-1**): residential energy use, commercial energy use, on-road transportation, waste and landfill gas, water and wastewater, off-road equipment, and Caltrain transit.

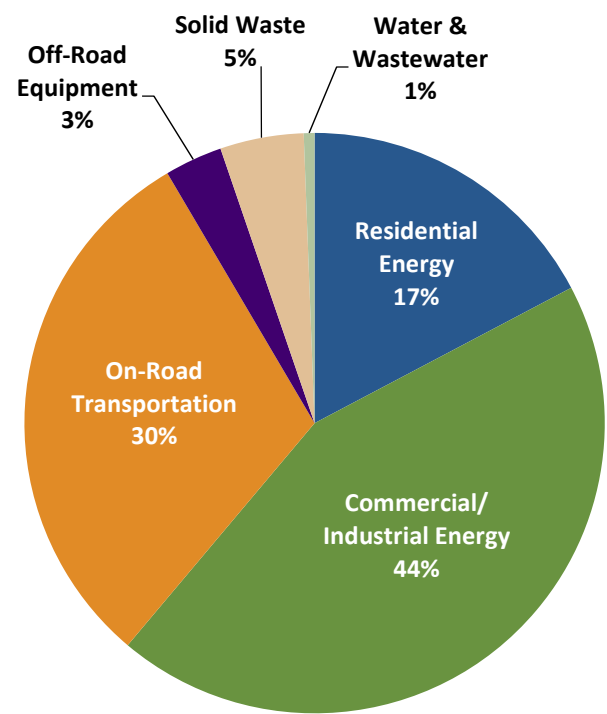


Figure 2-1. 2008 Community-wide Emissions

Since the 2008 baseline community-wide inventory, Sunnyvale has rebounded from the economic recession and experienced significant growth and commercial development (**Table 2-1**), including a 10% growth in its residential population, which surpasses the 2020 estimate outlined in the original CAP. Additionally, as discussed in **Chapter 1**, there has been significant national and statewide regulatory action intended to address climate change since 2008.

Table 2-1. Sunnyvale Characteristics

CHARACTERISTICS	2008	2014	PROJECTED 2020+
Population	133,110	147,055*	145,020
Households	54,130	54,587	59,660
Jobs	73,630	79,200	89,750

\*Population for 2014 estimated by City of Sunnyvale Finance Department, based on U.S. Census 2010.

+ Projections for 2020 as published in City of Sunnyvale’s Climate Action Plan, 2014.

The 2014 inventory was developed for the calendar year 2014 using ICLEI's SEEC Clearpath tool for estimating community-wide emissions. ClearPath is a web-based tool available to local governments<sup>1</sup> for developing GHG emissions inventories, forecasting future emissions, and tracking progress made towards achieving GHG reduction strategies through climate action planning and implementation (ICLEI 2016). The ClearPath tool is consistent with the guidelines of the *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories* (WRI and ICLEI 2014) and the *U.S. Community Protocol* (ICLEI 2012). The use of these guidelines is considered the best practice methodology for developing community inventories and allows for temporal comparisons to the baseline inventory. In conformance with reporting standards, all emissions are reported in carbon dioxide equivalents (CO<sub>2</sub>e), which account for the varied global warming potential (GWP) of different GHGs, to allow for comparison across sectors (WRI and ICLEI, 2014).

The methodology and data sources used for the 2014 inventory were consistent with those used for the 2008 baseline inventory, to the extent possible, to allow for comparison. Given the evolving nature of the science and associated protocols for developing community GHG inventories, the methodology for the 2014 inventory did deviate in some ways from that used in 2008, namely in the use of factor sets. Factor sets allow the conversion of activity data into estimated emissions (e.g., 0.435 lbs emissions produced per kWh of electricity consumed). Factor sets used in the 2008 baseline inventory reflected the best available data at the time.

Factor sets used in the 2014 inventory were largely those that recommended for use in ICLEI's *U.S. Community Protocol* (2012) and were coded as defaults into the ClearPath tool. These factor sets were not available at the time of development of the original 2008 inventory. Other factor sets have changed over time due to certain industry trends, such as PG&E's electricity emissions factor, which is estimated to produce lower emissions per unit of electricity in 2014 due to a shift towards more renewable energy sources by the utility. When available, alternate methods with customized emissions factors based on state and locally available data were used for water, wastewater, waste disposal, off-road emissions, and Caltrain. For example, local waste characterization factors from a Sunnyvale 2010 citywide study were used to estimate emissions from waste disposal. This results in an

---

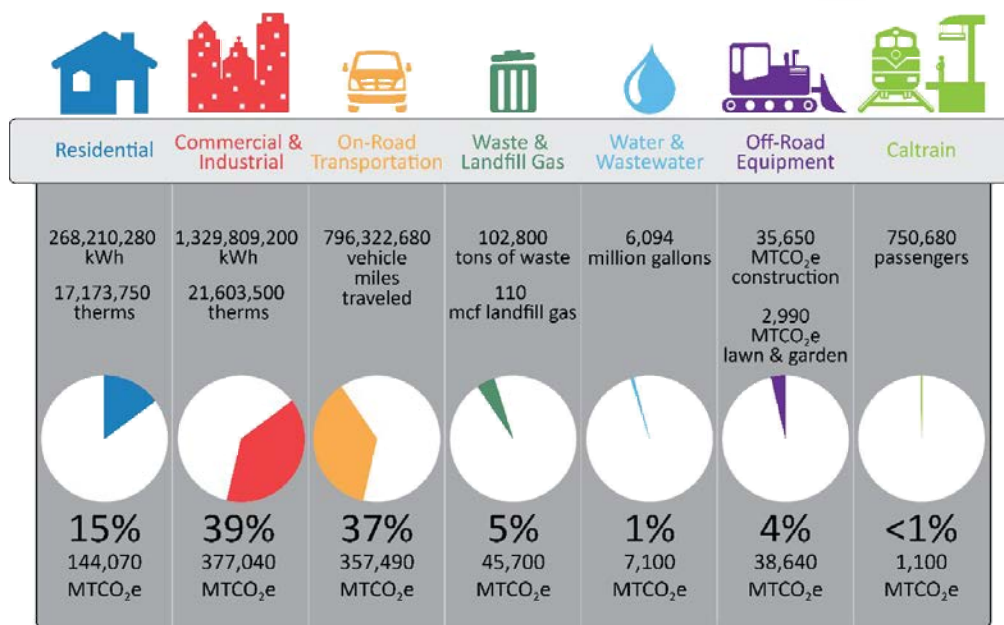
<sup>1</sup> As of 2016, ClearPath is available at no-cost to California communities through the Statewide Energy Efficiency Collaborative, a collaboration between statewide non-profits and investor-owned utilities to support the development of tools and information for climate action planning.

emissions inventory that reflects local conditions rather than relying on statewide or national trends and conditions.

### 2.1.2 Results

Sunnyvale's community-wide GHG emissions in 2014 totaled 971,130 MTCO<sub>2</sub>e distributed across seven sectors. The highest emissions came from commercial and industrial energy use, which contributed to 39% of the City's total emissions (377,040 MTCO<sub>2</sub>e). The second most significant contributions were from on-road transportation, accounting for 37% of total emissions (357,490 MTCO<sub>2</sub>e). Residential energy use contributed to 15% (144,070 MTCO<sub>2</sub>e) of total emissions. These three sectors total 91% of the City's emission.

Sector-specific emissions were determined based on activity data, such as the electricity consumed or fuel consumed. **Figure 2-2** summarizes the activity data, GHG emissions, and each sector's contribution to Sunnyvale's overall GHG emissions.



**Figure 2-2. GHG Emissions and Activity Data by Sector**

### 2.1.3 Revisions to 2008 Baseline

The methodology for estimating community GHG emissions continues to evolve as the scientific community's understanding of global warming expands with further study. The methodology used at the time Sunnyvale's baseline 2008 GHG inventory was developed has undergone several updates and is no longer consistent with the currently accepted methodology. Therefore, revisions to the 2008 Baseline GHG inventory were made as a part of this report to allow for better comparability of the reporting year (2014) to the baseline year. This approach is consistent with best practices utilized by other communities in California that are actively tracking GHG emissions and monitoring implementation of adopted climate action plans.

Specifically, the 2008 baseline inventory was updated to reflect: (1) revised global warming potentials (GWP) for GHGs emitted in all sectors; and (2) sector-specific revisions to the methodology for estimating emissions from the solid waste, transportation, and off-road sectors. These updates are consistent with the guidance contained in ICLEI's *U.S. Community Protocol* (2012), which provides recommendations for how to calculate GHG emissions and is identified by the State as the recommended protocol for GHG inventories.

The revised estimated 2008 GHG emissions for Sunnyvale is 1,153,970 MTCO<sub>2</sub>e. This revised estimate is 9.1% lower than the original 2008 estimate of 1,270,170 MTCO<sub>2</sub>e included in the adopted CAP. The changes to the emissions inventory are itemized below (**Table 2-2**).

**Table 2-2. Original and Updated 2008 Baseline Inventory by Sector**

SECTOR	MTCO <sub>2</sub> E (ORIGINAL INVENTORY)	MTCO <sub>2</sub> E (UPDATED INVENTORY)	PERCENT CHANGE
Residential	198,140	199,150	0.5%
Commercial/Industrial	502,210	505,620	0.7%
On-road Transportation	442,610	350,370	-20.8%
Solid Waste	80,570	53,600	-33.5%
Water & Wastewater	6,870	6,920	0.7%
Off-road Equipment	37,830	37,220	-1.6%
Caltrain	1,940	1,090	-43.9%
<b>Total</b>	<b>1,270,170</b>	<b>1,153,970</b>	<b>-9.1%</b>

2.1.4 Comparison to Revised 2008 Baseline

Sunnyvale’s community-wide GHG emissions in 2014 (971,140 MTCO<sub>2</sub>e) were overall 15.8% lower than in 2008 (1,153,970 MTCO<sub>2</sub>e). This represents a reduction in emissions that is in line with meeting the state recommended target for a 15% reduction from 2008 baseline levels (equivalent to 1990 levels) by 2020.

**Figure 2-3** compares estimated 2008 and 2014 GHG emissions for each major sector; it does not include Caltrain emissions, which are <1% of the total community emissions. Of the seven sectors evaluated in both inventories, the following three sectors showed reductions in emissions in 2014 compared to 2008: residential energy; commercial energy; and solid waste. Although the remaining four sectors (on-road transportation; water and wastewater; off-road equipment; and Caltrain transit) were higher in 2014 than in 2008, the increase from the baseline was minimal.

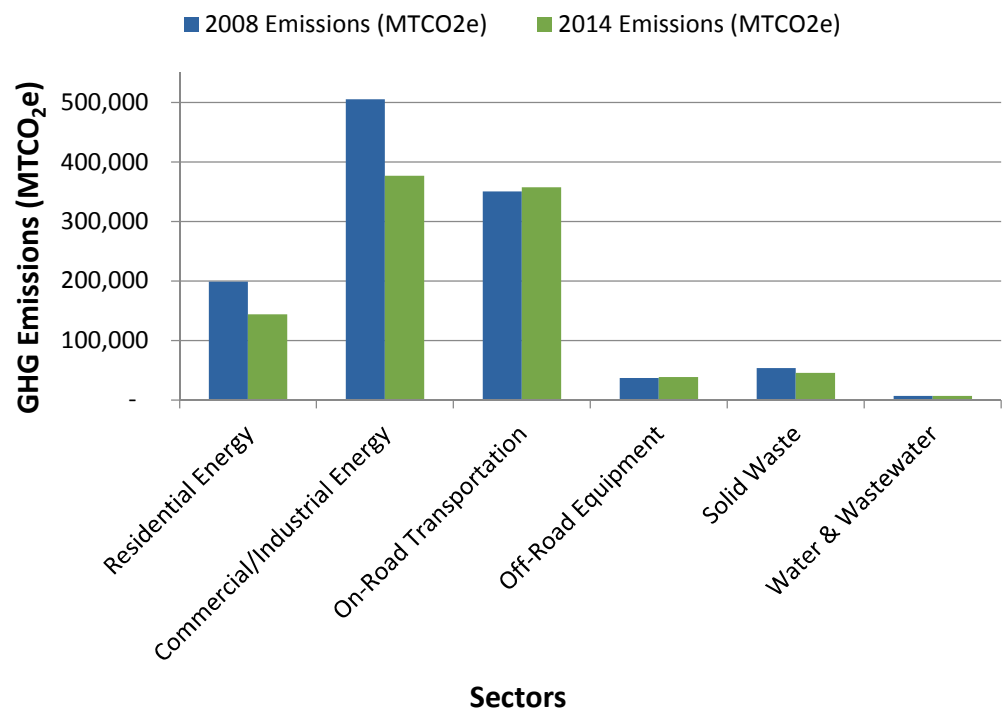


Figure 2-3. Cross-sector Comparison of 2014 Inventory to Baseline

**Table 2-3** shows a comparison of key activity data that influence the emissions for the years 2014 and 2008. This facilitates a better understanding of emissions that changed due to actual changes in actions undertaken by the Sunnyvale community versus changes that may have occurred due to emissions factors, which are often driven by updates in technology (e.g., cleaner fuels or more fuel-efficient vehicles) or regulatory standards (e.g., achievement of the required state-mandated RPS by the energy utility).

**Table 2-3. Activity Data and Emissions in 2014 vs. 2008 Baseline**

SECTOR	KEY ACTIVITY METRIC	VALUE OF METRIC 2014	MTCO <sub>2</sub> E 2014	VALUE OF METRIC 2008	MTCO <sub>2</sub> E 2008
Residential Energy	kWh consumed	268,210,280	52,920	292,574,670	85,530
	Therms consumed	17,173,750	91,140	21,346,435	113,620
Commercial/ Industrial Energy	kWh consumed	1,329,809,200	262,390	1,336,804,630	390,780
	Therms consumed	21,603,500	114,650	21,576,010	114,840
On-Road Transportation	Vehicle miles traveled	796,322,680	357,490	742,105,140	350,370
Solid Waste	Tons disposed	102,800	38,650	101,700	39,970
	MCF of landfill gas	113	7,050	200	13,630
Water & Wastewater	Million gallons of water consumed	6,090	7,090	7,760	6,920
Off-Road Equipment	Construction	N/A	35,650	N/A	34,350
	Lawn & Garden	N/A	2,990	N/A	2,870
Caltrain Transit	Passengers/ year	745,720	1,100	496,030	1,090
<b>Total</b>			<b>971,130</b>		<b>1,153,971</b>



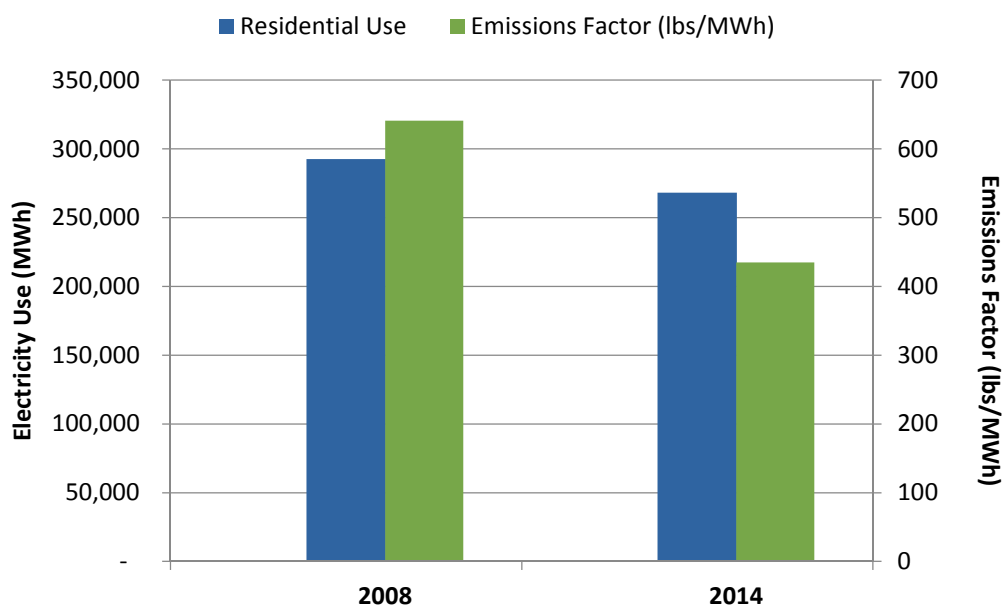


The emissions from each sector and key drivers impacting emissions estimates are summarized below.

### *Residential and Commercial Energy Sectors*

Overall, emissions for residential energy and commercial/industrial energy sectors (based on electricity and natural gas use) showed reductions of 28% and 25%, respectively, making these the sectors with the most significant reductions.

Emissions from electricity decreased by 38% and 33%, respectively, for the residential and commercial sectors. This decrease can be explained largely by a significant change in the emissions factor (i.e., GHG emissions per unit of electricity), and to a lesser extent by the change in the actual consumption of electricity (**Figure 2-4**). The emissions factor changed from 641 lbs/MWh (0.000288 MTCO<sub>2</sub>e/kWh) in 2008 to 435 lbs/MWh (0.000197 MTCO<sub>2</sub>e/kWh) in 2014 (PG&E, 2016), which represents a 32% reduction since 2008. This reflects PG&E's increasing use of renewable sources for generating electricity in an effort to meet the state's renewable portfolio standards. PG&E's RPS reached 27% in 2014 (PG&E, 2016). The actual residential electricity provided by PG&E was 8% lower during this period, thereby influencing the total emissions from electricity to a lesser extent.



**Figure 2-4. Influence of Community Activity vs. Emissions Factors on Total Emissions from Residential Electricity Use**

The gas emissions factor of 11.7 lbs/therm (0.00531 MTCO<sub>2</sub>e/therm) did not change from 2008 to 2014. However, the residential energy sector experienced a 20% reduction in emissions due to a corresponding 20% reduction in natural gas use since 2008.

### Solid Waste

Emissions reduced by 15% from 2008 to 2014. This is primarily due to a 44% reduction in the volume of methane-containing landfill gas produced from Sunnyvale's closed landfill, which resulted in a 48% decrease in landfill emissions.

Municipal solid waste (MSW) generated by the community decreased from 100,951 tons in 2008 to 96,374 tons in 2014. Total tonnage of waste (including MSW, alternative daily cover [ADC], and waste converted to energy) disposed increased by 1% overall. This increase was driven primarily by recent increases in construction activity within the City.

Despite this increase, there was a net emissions reduction of 3% from waste disposal due to a higher proportion of construction and demolition (C&D) waste<sup>2</sup> in the ADC in 2014.



*Emissions from Sunnyvale's trash collection trucks as well as from waste decomposition contribute to community-wide emissions, even though the waste is disposed of in landfills outside our City's boundaries*

### On-road Transportation

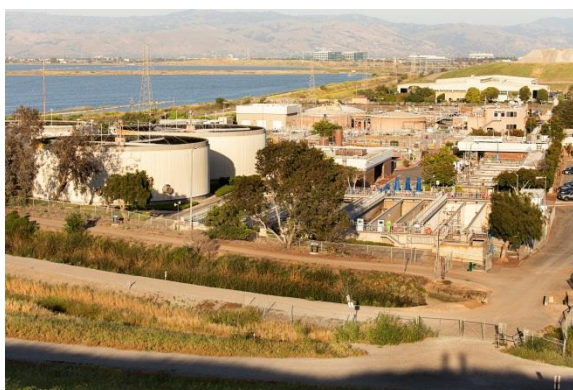
Emissions from on-road transportation increased by 2% from 2008 to 2014. This is due to a 7% increase in vehicle miles traveled (VMT) from 2008 to 2014. The emissions factors (CO<sub>2</sub>e/mile), which were derived from the EMFAC2014 model<sup>3</sup> in both cases, decreased by roughly 4% (from 0.000472 MTCO<sub>2</sub>e/mile in 2008 to 0.000449 MTCO<sub>2</sub>e/mile in 2014). This decrease is likely due to a trend towards cleaner vehicles that produce fewer emissions per unit mile.

<sup>2</sup> C&D waste contains less organic material compared to other types of ADC, such as sludge; consequently, C&D waste emits fewer GHGs in a landfill.

<sup>3</sup> EMFAC is CARB's model for estimating emissions from mobile sources, including on-road vehicles (cars, trucks, buses).

### Water and Wastewater

Water consumption in Sunnyvale decreased by 21% between 2008 and 2014. Despite this, emissions increased by 2% due to a higher emissions factor as identified in a recent study of the energy intensity of water (Cooley and Wilkinson, 2012). The significantly higher electricity demand per unit of water (5,330 kWh/million gallons in 2014 vs. 3,050 kWh/million gallons vs. 2008) for extraction, conveyance, treatment, and distribution explains the increase in emissions for this sector.



*Sunnyvale's Water Pollution Control Plant contributes emissions from energy use and treatment processes*

In addition, emissions from wastewater treatment operations processes were not accounted for in 2008 inventory, but were included in the 2014 inventory to establish a way to compare changes in emissions that may result from anticipated modifications to treatment processes and capital improvements at the Water Pollution Control Plant (WPCP) in upcoming years. WPCP emissions contributed 49% of the emissions for this sector in 2014 (less than 1% of the City's total emissions).

### Off-road Equipment

Emissions increased by 4% as estimated by CARB's OFFROAD model.

### Caltrain Transit

Emissions from Caltrain transit increased by 1%. The annual Caltrain ridership increased by nearly 50%, from 496,000 passengers in 2008 to 746,000 passengers in 2014. It is likely that the number and frequency of trains remained roughly the same, with the only difference being a higher occupancy rate per train. Only half the emissions from each gallon of diesel fuel consumed by Caltrain were attributed to Sunnyvale. The



*Passenger boardings at the Sunnyvale Caltrain station nearly doubled between 2008 and 2014*

emissions factor (CO<sub>2</sub>e/gallon of diesel) changed from 0.0103 MTCO<sub>2</sub>e/gal in 2008 to 0.00515 MTCO<sub>2</sub>e/gal in 2014, likely due to improved fuel efficiency of the trains. The overall impact of Caltrain emissions, however, is negligible as they comprise less than 1% of community-wide emissions.

2.1.5 Comparison to Targets

**Figure 2-5** shows a comparison of 2008 and 2014 emissions to short and longer term targets set by AB 32 and S-3-05. Further CAP implementation is designed to achieve reductions of 25.6% by year 2020 and 37.0% by year 2035, assuming the adoption of a CCE program (**CAP action EP-1**).

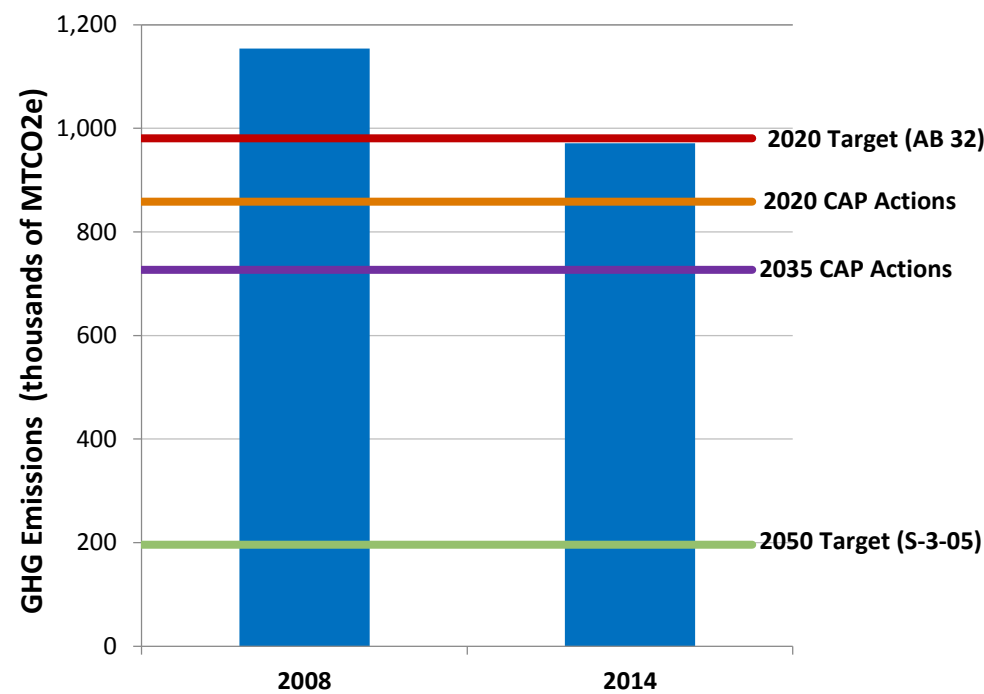


Figure 2-5. GHG Emissions Relative to Targets

## 2.2. Municipal GHG Inventory

### 2.2.1 Background

A municipal inventory provides an estimate of emissions from city-owned or – controlled (either financially or operationally) facilities or processes and is distinct from the community inventory discussed above. A municipal inventory is included within a community-wide inventory, but provides a more granular view of emissions that city governments can directly influence as a part of their normal operations.

In 2007, the City of Sunnyvale developed its first municipal greenhouse gas (GHG) inventory. This inventory tracked emissions from three key areas of City operations: 15 selected City facilities, fleet operations, and traffic signals and street lights. The inventory reflected data for Fiscal Years 2005-2006 (FY 05-06), and also reported annual historical emissions since Fiscal Year 1990-1991.

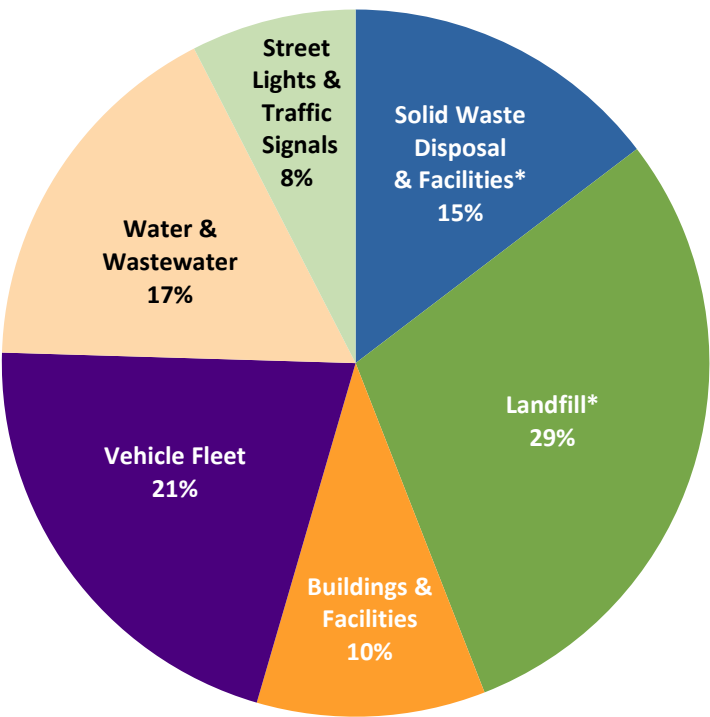
The current 2014 inventory serves to update the FY 05-06 inventory. This inventory was developed to be consistent with industry guidelines for creating and maintaining local government GHG inventories, including those prescribed by ICLEI-Local Governments for Sustainability (ICLEI USA) as well as those documented in the *Local Government Operations Protocol, Version 1.1* and the *Global Protocol for Community-Scale Greenhouse Gas Emissions*. The inventory covers data for the calendar year 2014 and reports Scope 1 (direct emissions from fuel consumption in City buildings and vehicles) and Scope 2 (indirect emissions from electricity use) emissions from all City-owned facilities and City operations. Scope 3 emissions (emissions from processes occurring outside the City’s jurisdictional boundaries or ones that the City does not control) are also reported as a part of the City’s inventory. **Table 2-4** shows the distribution of Sunnyvale’s government operations emissions by sector and scope.

**Table 2-4. Sunnyvale’s Government Operations Operational GHG Emissions by Sector and Scope**

SECTOR	GHG EMISSIONS BY SCOPE		
	SCOPE 1	SCOPE 2	SCOPE 3
Solid Waste	•	•	•
Buildings & Facilities	•	•	
Vehicle Fleet	•		•
Water & Wastewater	•	•	
Street Lights & Traffic Signals	•	•	

2.2.2 Results

The municipal emissions for the City totaled 23,970 MTCO<sub>2</sub>e distributed across five sectors as shown in **Figure 2-6**. Of the 5 sectors covered, the most significant emissions were from the Solid Waste sector, accounting for 44.1% of the City’s government operations emissions (10,560 MTCO<sub>2</sub>e).



**Figure 2-6. Sunnyvale Landfill GHG Emissions Compared to Remaining City’s GHG Emissions**

\* Solid waste disposal and facilities and landfill together constitute the Solid Waste sector, which makes up 44.1% of the City’s municipal emissions.



The total municipal emissions were largely dominated by fugitive emissions from Sunnyvale's closed, capped landfill, as shown in **Figure 2-6**. The Sunnyvale landfill by itself contributed 29.4% (7,050 MTCO<sub>2</sub>e) of the City's total emissions. The landfill continues to be monitored for compliance with federal and state regulations and has not accepted waste disposal since 1993. As such, aside from ensuring continued compliance and ongoing capture of methane emissions, the community has little opportunity to influence the emissions from the closed landfill.



*Goats grazing on Sunnyvale's closed landfill. Landfill gas is largely captured and used to power Sunnyvale's WPCP, while trace amounts of it contribute to the City's emissions*

The City's vehicle fleet was the second largest contributing sector (5,020 MTCO<sub>2</sub>e or 21%) to the City's government operations emissions. Water and wastewater treatment, distribution, and delivery contributed to the third most significant emissions (4,070 MTCO<sub>2</sub>e or 17.0%) to the City's government operations emissions.



*Sunnyvale's vehicle fleet includes vehicles used for City operations, such as Public Safety*

Buildings & Facilities produced 2,510 MTCO<sub>2</sub>e (10.5%), with city offices producing the most emissions. Street Lights & Traffic Signals was the smallest (7.6%) contributing sector to the City's government operations emissions, producing 1,810 MTCO<sub>2</sub>e.

### 2.2.3 Comparison to Baseline

As these guidelines were all developed after 2007, the FY 05-06 inventory was not consistent with any of the established protocols. As a result, the 2014 municipal inventory differs from the FY2005-2006 municipal inventory in the following ways:

- *Data are reported by calendar year rather than fiscal year.* Unlike the FY 05-06 inventory, which reports fiscal year data, the 2014 inventory was developed using calendar year data, for consistency with international, national, and state standards. Further, not all City departments consistently track data on a fiscal year basis. Lastly, inventory reporting needs to be consistent with Sunnyvale's CAP tracking and reporting, which will be done by calendar year.
- *Data are reported comprehensively from all facilities and operations that the City controls.* The 2014 inventory comprehensively covers all operations over which the City has operational control, including some that were not included in the FY 05-06, such as the Sunnyvale landfill, water distribution systems, and the smart station, among others.
- *Data are reported for operations and energy use.* The 2014 inventory records not only the emissions resulting from the use of grid electricity and combustion of fuels (natural gas, gasoline, and diesel) in all City operations, but also records emissions generated from processes themselves, such as the treatment of wastewater and the decomposition of waste in a landfill. In contrast, the FY 05-06 inventory only reports emissions from the use of electricity and fuel.

For these reasons, comparisons between the 2014 inventory and the FY 05-06 inventory do not yield any meaningful conclusions about the City's efforts to reduce emissions since the previous inventory was developed.

As the 2014 inventory is a complete, comprehensive inventory that was developed in accordance with established protocols for municipal inventories, comparisons of this inventory to future inventories, such as that developed for the next CAP biennial report, will be possible.



# 3 - Climate Action Plan Implementation for 2014-2015

## 3.1. CAP Implementation Results 2014-2015

This chapter summarizes Sunnyvale's CAP implementation efforts since its adoption in 2014. Although the analysis year for the community and municipal inventories in **Chapter 2** is 2014 (selected based on GHG emissions data availability), CAP implementation progress was reported for both calendar years 2014 and 2015, so as to reflect the most recent year of data available at the time of publication of this report.<sup>4</sup>

The actions identified by the CAP vary in both scope and resources required. Some actions were considered relatively straightforward and have been completed, such as changes to conditions of approval related to new development. Other actions represent new programs that require significant resources to develop and implement.

The CAP identifies a collection of 129 actions under 11 key goal categories:

- Open Space and Urban Forestry (OS)
- Decrease Energy Consumption (EC)
- Provide a Sustainable Energy Portfolio (EP)
- Decrease Water Consumption (WC)
- Reduce Landfilled Waste (LW)
- Reduce Off-Road Equipment Emissions (OR)
- Increase and Retain Awareness of Sustainability Issues (CA)
- Improve Mobility through Land Use Planning (LUP)
- Expand Sustainable Circulation and Transportation Options (CTO)

---

<sup>4</sup> Although CAP implementation updates were recorded for both years, only 2014 updates were used to estimate GHG reductions from CAP actions for consistency with the inventory.

- Optimize Vehicular Travel (OVT)
- Adaptation Strategies

A summary of the implementation status of all CAP actions by goal area is given in **Table 3-1**. It should be noted that some of these actions are directly tied to GHG emissions reductions, while many others serve as supportive actions. The 129 actions outlined in the CAP have the following status as of 2016:

- 56% have been completed or are in on-going implementation during 2014-2015;
- 16% are currently in progress (e.g., pilot study underway);
- 6% were scheduled for implementation in 2014-2015 but have not yet been started;
- 20% were scheduled to begin in 2016 or later years.

**Table 3-1. Implementation Status of CAP Actions by Goal Area**

GOAL CATEGORY	TOTAL NUMBER OF ACTIONS	NUMBER OF COMPLETED OR ONGOING ACTIONS	NUMBER OF ACTIONS IN PROGRESS	NUMBER OF ACTIONS REMAINING
Open Space and Urban Forestry (OS)	7	6	1	0
Decrease Energy Consumption (EC)	19	10	1	8
Provide a Sustainable Energy Portfolio (EP)	7	4	1	2
Decrease Water Consumption (WC)	8	8	0	0
Reduce Landfilled Waste (LW)	5	4	0	1
Reduce Emissions from Off-Road Equipment (OR)	6	3	0	2*
Increase and Retain Awareness of Sustainability Issues (CA)	13	5	4	4
Improve Mobility through Land Use Planning (LUP)	19	6	6	7
Expand Sustainable Circulation and Transportation Options (CTO)	26	19	0	7
Optimize Vehicular Travel (OVT)	12	5	3	4
Adaptation Strategies	7	2	4	1
<b>Total</b>	<b>129</b>	<b>72</b>	<b>20</b>	<b>36</b>

\*1 action (OR-2.2) was discontinued due to challenges with implementation. See Appendix A.

Sunnyvale's 2014 Community GHG Emission inventory shows a significant reduction in overall GHG emissions (see **Chapter 2**); however, these reductions cannot be definitively attributed to any specific CAP reduction measure or action. Based on the actions that can be quantified with reasonable reliability using the performance metrics identified in the CAP, the implementation of CAP actions has resulted in an estimated 21,470 MTCO<sub>2</sub>e reduction toward Sunnyvale's GHG emissions. These emissions reductions were achieved in 7 of the 11 goal categories in the CAP and are shown in more detail in **Table 3-2**. The 2014 reductions noted in this table demonstrate the quantifiable impact of local CAP implementation efforts in Sunnyvale.

**Table 3-2. Emissions Reductions from Local CAP Implementation Efforts 2014-2015, by Goal Category**

GOAL CATEGORY	2014 REDUCTIONS (MTCO <sub>2</sub> E)	PLANNED 2020 REDUCTIONS* (MTCO <sub>2</sub> E)	PROGRESS TO 2020 TARGET
Open Space and Urban Forestry (OS)	4	320	1.3%
Decrease Energy Consumption (EC)	2,970	74,660	4.0%
Provide a Sustainable Energy Portfolio (EP)	4,270	101,610	4.2%
Decrease Water Consumption (WC)	780	820	95.1%
Reduce Landfilled Waste (LW)	7,120	26,690	26.7%
Reduce Emissions from Off-Road Equipment (OR)	0	7,220	0%
Increase and Retain Awareness of Sustainability Issues (CA)	0	0	0%
Improve Mobility through Land Use Planning (LUP)	350	13,990	2.5%
Expand Sustainable Circulation and Transportation Options (CTO)	3,550	10,840	32.7%

GOAL CATEGORY	2014 REDUCTIONS (MTCO <sub>2</sub> E)	PLANNED 2020 REDUCTIONS* (MTCO <sub>2</sub> E)	PROGRESS TO 2020 TARGET
Optimize Vehicular Travel (OVT)	2,420	10,260	23.6%
Adaptation Strategies	0	0	0.00%
<b>Total</b>	<b>21,470</b>	<b>246,410</b>	<b>8.7%</b>

\*As of the development of this CAP biennial report, the City Council has approved Sunnyvale's participation in a local CCE Program. While the CCE program is still under development, it is anticipated to begin operations in winter 2016/2017. Therefore, the planned 2020 GHG reductions reflect reductions that account for the existence of a CCE program.

During this reporting period, the City achieved the greatest measurable impacts in reducing emissions from six goal areas as discussed below.

### *Decrease Energy Consumption (EC)*



The City's measurable impact in this goal category is driven by efforts in Reduction Measure *EC-2: New Constructions and Remodels*. This measure entails implementing the CALGreen Title 24 standards as a part of the City's green building code as well as providing incentives for new construction to achieve standards higher than the mandatory Tier 1 standards. In 2014, **more than 2.6 million square feet of commercial space were built to the City's green building standards**. In addition, the City is converting its streetlights to energy-efficient LED bulbs. Approximately 1,850 streetlights were converted to in 2012, and another 50 were converted in 2015. Efforts are under

way to convert all remaining city-owned streetlights, approximately 6,900 bulbs, by 2017.



*LEED-GOLD certified Yahoo! office building in Sunnyvale (Photo credit: Flickr user Yahoo! Sunnyvale; obtained under Creative Commons license)*

Overall, residential energy has decreased significantly since 2008. Specifically, in 2014, the use of residential electricity supplied by PG&E<sup>5</sup> decreased by 8% and residential natural gas use decreased by 20% compared to 2008.

<sup>5</sup> Reductions noted here are for PG&E-supplied electricity only. This does not include data on electricity use that may be offset by local generation (e.g., from residential solar installations).

Commercial/Industrial energy use has remained flat, while office and industrial floor area increased by approximately 1.7 million square feet.

## *Provide a Sustainable Energy Portfolio (EP)*



As of 2015, **Sunnyvale has a total of 10.78 MW of local solar installations<sup>6</sup>**. This has contributed to a measurable reduction for Reduction Measure *EP-2: Local Renewable Energy*. Nearly 45% of this solar power is generated from residential solar projects, with 24% and 31% from commercial and industrial projects, respectively.

## *Expand Sustainable Circulation and Transportation Options (CTO)*



The City's measurable impact in this goal category is driven by efforts in Reduction Measure *CTO-1: Bicycle, Pedestrian, and Transportation Design Elements*. Since 2008, the percentage of **commute trips taken by bicycles in Sunnyvale has doubled<sup>7</sup>**, and the City has expanded its network of bicycle lanes. These efforts in improving bicycling in Sunnyvale are responsible for reducing GHG emissions by 2,500 MTCO<sub>2</sub>e. In addition, the percentage of **students using non-motorized transport to commute to school increased from 14% in 2008 to 41% in 2014<sup>8</sup>**.

Since 2008, Sunnyvale's population has increased by 10% and the number of jobs in the City has grown by 8%. According to MTC data, total vehicle miles traveled (VMT) in Sunnyvale has increased by 7% since 2008. However, vehicle-related emissions are up by only 2% as vehicle efficiency is improving and there are cleaner vehicles on the road. Additionally, Caltrain ridership increased by 45% since 2008 as more residents and employees are choosing public transit for their weekday commutes.



<sup>6</sup> Data for solar installations represent all interconnected solar photovoltaic (i.e., net energy metered) systems within PG&E's service territory within the City of Sunnyvale.

<sup>7</sup> Based on bicycle commute mode share percentages from the U.S. Census Bureau's American Community Survey 1-Year Estimates on commuting characteristics for Sunnyvale, California.

<sup>8</sup> Estimate is based on survey data from 13 of 16 Sunnyvale schools that participate in the County's Safe Routes to School program. [The total number of schools in Sunnyvale is 18; two schools do not participate in the program]].

### Reduce Landfilled Waste (LW)



Despite a growing population, Sunnyvale is throwing away less trash today than in 2008, contributing to significant reductions in this goal category. Through Reduction Measure *LW-2: Recycling and Composting*, the City aims to divert 75% of the waste it generates away from landfills to be recycled or composted. As of 2014, the City was **diverting 64% of its waste**, keeping approximately 18,101 tons of waste out of the landfill and reducing GHG emissions by 7,120 MTCO<sub>2</sub>e. Sunnyvale residents produced 39% less waste per person than state targets, and virtually all homes and apartments participate in recycling programs. The City is expanding its commercial organics program to include small generators of organic waste and is also considering starting a residential food waste composting program in 2017.



*Food scrap bins from Sunnyvale's residential pilot program in 2016*

### Optimize Vehicular Travel (OVT)



Sunnyvale has achieved reductions in this goal category by helping to promote increased use of alternatively fueled vehicles. Reductions are largely a result of progress on Reduction Measure *OVT-1: Clean Alternative Motor Vehicles and Fuels*, due to the large number of electric vehicle chargers installed in the community as well as the prevalence of alternatively fueled vehicles. As of 2014, there were at least 470 electric vehicle chargers<sup>9</sup> in Sunnyvale, promoting increased use of electric vehicles and reducing GHG emissions by 780 MTCO<sub>2</sub>e annually. Furthermore, as of 2014, there are 1,500 alternatively fueled vehicles registered to Sunnyvale owners, showing an increasing proliferation of zero-emission vehicles in the community.

<sup>9</sup> These data represent only those charging stations provided by ChargePoint and installed in non-residential locations for public use. Charging stations supplied, operated, or installed by other manufacturers are not captured in the data reported here.



## Decrease Water Consumption (WC)



Spurred by the strong community response to California's drought conditions, Sunnyvale residents and businesses have decreased water use 25% from 2008 levels, going even further than the reduction target called for in Reduction Measure WC-2: *Water Conservation*. Because of these conservation efforts, Sunnyvale has reduced GHG emissions by 780 MTCO<sub>2</sub>e

annually and has reached nearly 80% of the performance targets for the goal area. Furthermore, Sunnyvale is currently partnering with public and private agencies to expand the existing recycled water network in the community; service in the expanded network will commence in 2017.



*In 2015, Sunnyvale increased the rebate offered through Santa Clara Valley Water District from \$2 to \$3 for turf replacement with drought-resistant plants*

In addition to the goal areas discussed above, the City has also seen GHG reduction impacts in other measures that are supportive in nature and for which GHG reductions cannot be easily quantified. For example, the City is engaged in ongoing enforcement of the ban on plastic bags (**CAP action LW-1.1**) as well as the ban on expanded polystyrene (EPS) containers (**CAP action LW-1.3**), although the GHG reductions from this implementation cannot be quantified. While the volume of GHG reductions achieved during this reporting period may appear relatively small relative to Sunnyvale's planned 2020 reductions, these supportive measures serve as a foundation for the City to build on and achieve significantly greater reductions in future years.



## 3.2. Key Initiatives “In Progress” in 2014 and 2015

The implementation of the CAP is anticipated to be monitored in two-year cycles, concurrent with updates to the GHG inventories. Many significant initiatives and efforts were set in motion during 2014 and 2015 and are and considered to be “in progress.” These initiatives are foundational to CAP implementation in the next biennial reporting cycle for 2016 and 2017. Updates on these significant initiatives are presented below.

### *Decrease Energy Consumption (EC)*

#### *Energize Sunnyvale*



*City staff educate the community about energy conservation as a part of the Energize Sunnyvale campaign*

For the years 2015 and 2016, Sunnyvale is competing with 49 other communities across the United States in the Georgetown University Energy Prize (GUEP) competition.

Participating communities are competing to achieve the greatest reductions in residential and municipal energy (electricity and gas) relative to their energy use in baseline years (2013 and 2014). The winning community will be awarded up to \$5 million to be

used for community energy programs. The City’s Energize Sunnyvale campaign aims to educate residents about ways to conserve energy and improve energy efficiency. The campaign includes: developing a community-based social marketing approach to target energy efficiency-related behaviors; promoting use of a new mobile phone app (iGreenSunnyvale), which gamifies energy conservation and encourages residents to engage in sustainable behaviors; expanding the availability and use of DIY home energy savings kits; increasing local awareness of energy efficiency financing/rebate programs; and raising awareness through social media and community events. Encouraging residential energy efficiency aligns with the City’s overall strategy of reducing our community’s energy use. In addition, the City offers property assessed clean energy (PACE) financing through CaliforniaFIRST (**CAP action EC-3.1**) and continues to promote its Community Development Block Grant (CDBG) program

(**CAP actions EC-3.2**) to provide financing to homeowners for energy efficiency upgrades.

### *Streetlight Conversion to LEDs*

The City owns and maintains approximately 8,800 streetlights, the majority of which are traditional high-pressure sodium lights. As of 2015, nearly 1,900 have been converted to LED fixtures as part of a pilot study. In 2015, the City Council authorized funding and the plan to complete the conversion of the remaining city-owned streetlights by 2017, which will be a direct implementation of **CAP action EC-1.1**.

### *Provide a Sustainable Energy Portfolio (EP)*

#### *Community Choice Energy Program*

In 2015, the City completed Study Issue ESD 14-02 Community Choice Aggregation, which served as an initial study of a Community Choice Energy (CCE) program for the South



Bay. Partners in this initial study included the cities of Cupertino and Mountain View and the County of Santa Clara. As a result, the City and its partners formed the Silicon Valley Community Choice Energy Partnership (SVCCEP). During 2015, these four SVCCEP sponsoring communities conducted a technical feasibility study to examine the viability of a local program that provided more renewable energy than that offered by PG&E at competitive prices. As of spring 2016, Sunnyvale and 11 other communities in Santa Clara County have voted to join and form the Silicon Valley Clean Energy Authority (SVCEA), a joint powers authority that will be responsible for administering the local CCE program. Sunnyvale staff, in collaboration with the sponsoring partners, is working to operationalize the SVCEA. During 2016, the SVCEA will develop and submit its implementation plan to the California Public Utilities Commission (CPUC) and undertake other necessary actions with the goal of launching the program in winter 2016/2017. These efforts are the foundation for the implementation of **CAP action EP-1.1**, which entails creating or joining a CCE program, and will help to significantly increase the renewable content of electricity provided to Sunnyvale.

## Improve Mobility through Land Use Planning (LUP)

### Transportation Demand Management



*The City's Lawrence Station Area Plan promotes mixed use developments around the Lawrence Caltrain station and also requires development projects to reduce the number of vehicle trips by providing alternative transportation options*

In late 2015, new guidelines for the development of transportation demand management (TDM) programs and monitoring procedures were developed. TDM programs are intended to reduce traffic congestion and corresponding emissions from new development projects. TDM programs are designed to promote more efficient utilization of existing transportation facilities, and to ensure that new

developments are designed to maximize the potential for alternative transportation usage. Larger developments (i.e., those exceeding specific floor-to-area ratios) in districts with industrial and service zoning or general industrial zoning in Sunnyvale may be required to include a TDM Program at the discretion of the approving body (City of Sunnyvale, 2016). The City also provides green building incentives for TDM program development (City of Sunnyvale, 2016). The City offers a Transportation Demand Management toolkit, which outlines several strategies, including pedestrian and cyclist accessibility, parking design measures, and carpooling and telecommuting strategies, to guide developers in creating successful TDM Programs (The Hoyt Company, 1999). TDM programs are also being included as an integral component of the City's Land Use and Transportation Element (LUTE) as well as specific redevelopment plans that are currently in progress including the Lawrence Station Area Plan (LSAP), the Peery Park Specific Plans (PSP), and El Camino Real Corridor Specific Plan.

The City recently partnered with the Santa Clara Valley Transportation Authority (VTA) to develop Peery Park Rides, a grant-funded 2-year pilot program to aggressively reduce vehicle trips by providing a flexible shuttle service to employees in Peery Park, a 446-acre area proposed for redevelopment and in proximity to major transit hubs. The program would use demand-driven technology to dynamically re-route the flexible shuttle service based on real-time customer trip needs, capturing a wider variety of trips than addressed by traditional transit. Peery Park property owners will form a Transportation

Management Agency (TMA) to provide data and guidance for planning related to the shuttle service. This pilot will inform the implementation of **CAP action CTO-3.5** (partnering with local/regional organizations to implement trip reduction programs) and **CTO-4.1** (requiring TDM programs at major employers).

### *Decrease Water Consumption (WC)*

#### *Recycled Water Expansion*

The City has completed and published a feasibility study for recycled water expansion in June 2013 (**CAP action WC-1.1**). The City is partnering with the Santa Clara Valley Water District and private partners to extend the existing recycled water purple pipe network along Wolfe Road through Cupertino. The project construction will begin in spring 2016 and operations will commence in 2017. This is consistent with **CAP action WC-1.3**, which aims at creating a purple pipe network for citywide use of recycled water.



*The extension of Sunnyvale's existing recycled water system along Wolfe Rd, which commenced in Spring 2016, will significantly expand the use of recycled water*

## 3.3. Updates to GHG Reduction Estimates

To ensure the CAP is accurate and consistent with best practices, the calculations of GHG emissions reductions from CAP implementation were reviewed and revised in this report. The revisions are partly a result of changes to the 2008 community-wide inventory (see Section 2.1.3), as well as updates to account for state regulatory actions and corrections to reductions calculations from local actions. Changes to Sunnyvale's 2008 baseline emissions resulted in changes to the projected levels of future emissions. This in turn affected the GHG emissions reductions estimated from implementation of CAP measures. Additional corrections were made to the methods and assumptions used to calculate GHG emissions reductions from a small number of CAP measures,



causing these numbers to be further revised. Updates made to estimated GHG reductions from CAP implementation are noted below.

### 3.3.1. Renewable Portfolio Standard

The CAP includes calculations for the GHG emissions reductions of the Renewable Portfolio Standard (RPS) implementation, a statewide program that requires utilities to procure a certain proportion of their electricity from renewable sources. When the original CAP was prepared, it did not appear likely that PG&E would reach the State-mandated RPS goal of 33% by 2020. The CAP assumed instead that in 2020, PG&E would have a 28% renewables portfolio. Based on mandatory reporting to the California Energy Commission, PG&E has confirmed that it expects to meet the 33% RPS target by 2020. The projection of reductions from RPS was revised upward to reflect this increased certainty.



When the original inventory was completed, the State had not established post-2020 targets for the RPS. The CAP assumed a relatively slow increase in the proportion of renewable energy, estimating that 37% of PG&E's electricity would be from renewable sources in 2035. In 2015, Governor Brown signed into law SB 350 (see Section 1.2), which requires utilities to supply 50% of their electricity from renewable sources by 2030. The CAP was revised to assume that 50% of PG&E's electricity would be from renewable sources

by 2035. The revisions to the RPS also corrected for errors in the original calculations of GHG emissions reductions that incorrectly assumed RPS would also reduce emissions associated with natural gas use.

### 3.3.2. Title 24

The CAP includes a projection of GHG reductions from the California Building Standards Code (Title 24), which requires increased energy efficiency in new buildings. These numbers were revised to reflect updated projections of how Title 24 would evolve and be implemented in the future, changes to the anticipated schedule of renovations for nonresidential buildings in Sunnyvale, and more

accurate estimates of the improved energy changes from future updates to Title 24. Changes to the anticipated schedule of renovations included a change to an initial assumption that nonresidential buildings would be renovated every 20 years (in order to have



all nonresidential buildings meet or exceed 2008 Title 24 standards by 2035). This was removed to reduce potential double counting with retrofit measures and to better match current best practices for calculating Title 24 reductions.

The original CAP also assumes that 30% of the 2022 Title 24 update would be captured in 2035. This assumption was revised to reflect current best practices that Title 24 will apply to the overall energy growth in Sunnyvale between 2020 and 2035, thereby allowing for an 87% capture of 2022 Title 2 reductions by year 2035. The more updated numbers used in these revisions also help to put Sunnyvale's GHG emissions forecast on a trajectory that is more consistent with the State's zero net energy (ZNE) plans for future new buildings, which are expected to begin taking effect in 2020.

### 3.3.3. Community Choice Energy

The CAP includes a projection of GHG reductions resulting from a Community Choice Energy (CCE) program, in which Sunnyvale residents and businesses can choose to receive their electricity from a local CCE program rather than from a private utility. This electricity is generally "cleaner" than the electricity from private utilities, resulting in significant GHG reductions. Based on an increased understanding of CCE programs, as well as the results of other CCE programs in northern California, the assumptions used to calculate Sunnyvale's reductions from CCE were revised.

As part of these updates, it was assumed that a greater proportion of Sunnyvale community members enrolled in the CCE would opt for the "light green" tier of renewable electricity (50% renewable energy by 2020, 65% renewable energy by 2035) and that a smaller proportion would select the premium "dark green" option of 100% renewable energy beginning in 2020. These changes reflect observed enrollment patterns in neighboring CCE programs (such as those in Marin and Sonoma counties), as well as estimates from updated CCE technical studies.

The CAP also originally assumed reductions in natural gas use and associated GHG emissions reductions resulting from a CCE program, but these reductions have been removed as the current regulatory structure of CCEs does not address use of natural gas.

These changes to the assumptions, as well as underlying changes to the CAP inventory, RPS, and Title 24, have caused the projection of GHG reductions from Community Choice Energy to be substantially revised.

### 3.3.4. Overall Impacts

Based on the changes discussed in this section and the changes to the inventory discussed in Section 3.3, the overall impact on Sunnyvale's GHG reduction calculations are shown in **Table 3-3** (assuming implementation of CCE).

**Table 3-3. Impacts of Baseline, Forecast, and Reduction Measure Updates to GHG Emissions, 2020 and 2035**

	GHG IMPACT IN ADOPTED CAP (WITH CCE)		UPDATED GHG IMPACT (WITH CCE)	
	2020	2035	2020	2035
Baseline	1,270,170	1,270,170	1,153,970	1,153,970
Forecast (BAU)	1,494,980	1,810,160	1,306,220	1,529,620
Forecast with state reductions (ABAU)	1,289,920	1,369,510	1,105,080	1,042,240
CAP reduction measures	-434,895	-649,123	-246,410	-315,130
Net GHG emissions with CAP	855,025	720,387	858,670	727,110
Percentage reduction from baseline	-32.7%	-43.3%	-25.6%	-37.0%



## 3.4. Proposed Revisions to Climate Action Plan

### 3.4.1. Proposed Revisions

As a part of the City's biennial CAP monitoring report, staff evaluated the feasibility of continuing to implement and track the CAP actions as written in the original 2014 CAP. The CAP is not a static document, and it was expected that changes may be considered as part of the biennial reporting process. This affords the City the opportunity to course correct, if needed, based on implementation experience, advances in technology, changes in the regulatory setting, or for other circumstances. Based on this, staff has identified and is proposing a limited number of revisions to CAP actions that would: (a) revise language of reduction measures; and/or (b) revise performance indicators.

The proposed revisions shown in red strikethrough and described in **Table 3-4** reflect the current environmental, regulatory, social, and financial context in which the CAP is being implemented and are intended to serve as improvements to certain elements of the CAP that may be out-of-date. In addition, proposed revisions include modifications to performance indicators that are used to report the progress made towards implementation in quantitative terms. Such modifications are intended to identify reliable indicators or groups of indicators that are already tracked or reported by the City, County, independent local entities, or regional third-party entities. Other proposed indicators changes reflect new indicators that the City intends to begin tracking and reporting in the upcoming years. Proposed indicator updates are intended to ensure continuity of data from the same sources in future reporting years, to allow for consistency, and ease of comparison to previous years.

Table 3-4. Proposed Revisions to CAP Actions

ORIGINAL CAP ACTION	REVISED CAP ACTION AND/OR INDICATOR	RATIONALE FOR MODIFICATION	DOES CHANGE IMPACT GHG REDUCTIONS?
<i>Actions Proposed for Deletion:</i>			
OR-2.2: Construction equipment must be maintained per manufacturer's specifications	None	City cannot monitor privately owned/operated construction equipment.	No
<i>Actions Proposed for Language Change:</i>			
EC-4.1: Consistent with California AB 1103, require all nonresidential building owners to disclose building energy consumption and building energy ratings upon sale or lease of building.	EC-4.1: Consistent with California AB <del>1103</del> 802, promote the availability of <del>require all nonresidential building owners to disclose building energy consumption and</del> building energy ratings <del>to building owners and</del> support other energy efficiency efforts resulting from AB 802 <del>upon sale or lease of building</del> .	AB1103 was repealed and replaced by AB 802. CEC working on regulations to implement AB 802. However, AB 802 has deleted the requirement for building owners to disclose energy information to prospective buyers, lessees, or lenders. Therefore, action is revised to broaden the approach.	No
LUP-2.1: Continue to plan for most new residential, commercial and industrial developments in specific plan areas, near transit, and close to employment and activity centers.	LUP-2.1: Continue to plan for most new residential, commercial and industrial developments <del>to be developed</del> in specific plan areas, near transit, and close to employment and activity centers.	Edited to clarify language.	No

ORIGINAL CAP ACTION	REVISED CAP ACTION AND/OR INDICATOR	RATIONALE FOR MODIFICATION	DOES CHANGE IMPACT GHG REDUCTIONS?
<i>Actions Proposed for Language and Indicator Change:</i>			
EC-2.3: Continue to provide incentives for new construction and remodels to adhere to a higher green building standard than required by the City.	<p>EC-2.3: Continue to provide incentives for new construction <del>and remodels</del> to adhere to a higher green building standard than required by the City.</p> <p>Change in performance indicators:            (1) <i>Cumulative number of new homes built <del>to Tier 1 standards or</del> above the City's mandatory green building standards</i>; (2)  <i>Cumulative square feet of new nonresidential square feet built <del>to Tier 1 standards or</del> above the City's mandatory green building standards</i></p>	<p>Remodel projects, due to their limited scope, are not compelled to exceed green building standards. There are other resources available to educate and encourage green practices for remodels. Additionally, the performance metric is focused on new buildings rather than on remodels.</p> <p>The performance indicator was revised to reflect the City's green building code, rather than the CALGreen standard, as new construction projects are required to comply with the local code.</p>	No


ORIGINAL CAP ACTION	REVISED CAP ACTION AND/OR INDICATOR	RATIONALE FOR MODIFICATION	DOES CHANGE IMPACT GHG REDUCTIONS?
CTO-3.5: Partner with GreenTRIP and other local or regional organizations to implement trip reduction programs in new residential, commercial, and mixed use developments.	<p>CTO-3.5: <del>Partner with GreenTRIP and other local or regional organizations to implement</del> Require trip reduction programs in new residential, commercial, and mixed use developments.</p> <p>Change in performance indicators:  <i>(1) Cumulative number of dwelling units in new developments <del>participating in GreenTRIP or similar efforts with TDM requirements</del>; (2) Cumulative nonresidential square feet in new developments <del>participating in GreenTRIP or similar efforts with TDM requirements</del>.</i></p>	Language was broadened to include trip reduction programs (other than only GreenTRIP) that the City is likely to participate in.	No
OVT-1.8: Accommodate neighborhood electric vehicles (NEVs) by enacting regulations consistent with the California Vehicle Code and the Manual of Uniform Traffic Control Devices.	<p>OVT-1.8: Accommodate <del>neighborhood electric vehicles (NEVs)</del> alternatively fueled vehicles by enacting regulations consistent with the California Vehicle Code and the Manual of Uniform Traffic Control Devices.</p> <p>Change in performance indicator:  <i>Cumulative number of <del>NEVs in operation</del> alternatively fueled vehicles in the City</i></p>	<p>Language was broadened to include different types of alternatively fueled vehicles, rather than only NEVs. Based on recent trends, it is likely that alternatively fueled vehicles, particularly EVs, will be more prevalent in Sunnyvale than NEVs in the upcoming years.</p> <p>The performance indicator was revised accordingly. This indicator is similar to that originally used for OVT-1.7.</p>	Yes Tracking the new performance indicator will result in an estimated 2020 emissions reduction of 7,970 MTCO <sub>2</sub> e compared to the originally estimated reduction of 4,780 MTCO <sub>2</sub> e.

ORIGINAL CAP ACTION	REVISED CAP ACTION AND/OR INDICATOR	RATIONALE FOR MODIFICATION	DOES CHANGE IMPACT GHG REDUCTIONS?
<i>Actions Proposed for Indicator Change:</i>			
LUP-1.2: Create maximum parking requirements and reduce minimum parking requirements for mixed-use development. Require parking lot sharing for mixed use or commercial development with complementary hours of operation.	Change performance indicator from: <del>Average monthly cost of parking in developments with unbundled parking</del> [Metric to be determined]	The current performance indicator cannot be tracked as the City does not monitor the cost of parking at all developments. The City will consider developing a better indicator during the next biennial reporting cycle.	Yes  Impact associated with the change in performance indicator will be determined when new indicator is identified.
OR-2.3: Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures [parts a through d, as specified in the adopted CAP], at a minimum, as appropriate to the construction project.	<del>Percent of construction equipment used in Sunnyvale which uses alternative fuels [CNG, LNG, propane, biodiesel, or electricity], or which uses hybrid technology</del>	The current performance indicator cannot be tracked as the City does not monitor each piece of equipment that is alternatively fueled; therefore, it has been proposed for deletion.	No
OVT-1.7: Facilitate new fueling stations that offer alternative fuels.	<del>Cumulative number of alternative fuel vehicles [excluding EVs and hybrids] in operation</del>	The current performance indicator as defined (i.e., excluding EVs and hybrids) cannot be tracked as most records of alternatively fueled vehicles include both EVs and hybrids. Therefore, it has been proposed for deletion. See OVT-1.8 for which a similar indicator has been proposed.	Yes  Deletion of this indicator will also eliminate all associated emission reductions. This change is offset by the increase in reductions resulting from the proposed change to OVT 1.8.

### 3.4.2. Impacts of Proposed Revisions to GHG Estimates

As shown, many of the proposed changes in **Table 3-4** would not have an impact on GHG reductions from the individual measures or actions. The changes to the following actions would decrease emissions reductions:

- **LUP-1.2:** As the monthly cost of parking cannot be tracked by the City, the proposed deletion of the indicator will eliminate the anticipated GHG reductions from this action. As of this report, staff has not determined an appropriate indicator to replace the original one, but plan to develop a robust indicator that is easily tracked for the next biennial report. Associated GHG reductions may be quantified when indicator is available.


- **OR-2.3:** Although this action is being implemented, the indicator cannot be tracked, as this action will only achieve emissions in the year in which it is implemented, rather than having a cumulative effect from year to year. Therefore, rather than relying on a performance indicator, the currently quantified emissions for this action can be assigned all at once in the final year (i.e., 2020 or 2035) of when they expected to be achieved.
- **OVT-1.7:** As the number of non-electric alternative fuel vehicles cannot be effectively tracked, it is proposed that reductions associated with these vehicles be removed from the CAP. An expanded performance indicator is recommended for use under OVT-1.8 below.
- **OVT-1.8:** Implementation of this measure, as proposed to be modified, will be tracked using the number of alternatively fueled vehicles (primarily electric) registered in Sunnyvale, as a source for this data has become readily available. This recommended performance indicator was not previously identified for tracking through the CAP and represents a significant shift from fossil fuels; therefore, associated GHG reductions should be monitored.

The changes in 2020 GHG emission reductions as a result of these changes are shown in **Table 3-5**. It is not expected that these changes will affect Sunnyvale's ability to meet or exceed the GHG reduction targets contained in the CAP.

**Table 3-5. Estimated 2020 Changes in Emissions Reductions from Proposed Action Changes**

ACTION	ORIGINAL 2020 EMISSION REDUCTION	ESTIMATED 2020 EMISSION REDUCTION AFTER CHANGES
LUP-1.2 *	320	0
OR-2.3	7,190	7,190†
OVT-1.7	1,210	0
OVT-1.8	4,780	7,970

\* The proposed changes to LUP-1.2 will cause the overall emissions reduction from Measure CTO-3 to increase from 3,120 to 3,200.

†Emissions will be assigned only in the years 2020 and 2035.

Full implementation of the CAP is estimated to reduce emissions by 246,410 MTCO<sub>2</sub>e, as noted in **Table 3-3**, assuming the successful implementation of a CCE program. If the proposed changes to the CAP are adopted, the estimated GHG reductions from full implementation of the CAP will be 248,150 MTCO<sub>2</sub>e.

Pending approval of these proposed changes by the City Council and any additional direction, the CAP will be updated to reflect the changes.



## 4 – Future CAP Implementation

This chapter provides an updated outlook of CAP implementation through 2020, including priorities for the next two-year cycle, revisions to CAP Work Plan 2020, and updates on funding sources. This biennial report offers the City an opportunity to assess whether priorities have changed since the original CAP was adopted in 2014 and to determine the best path forward for continued implementation of CAP measures. The report accounts for new information on the availability of resources (staff and financial), changes in the regulatory context, and advances in available technologies, which may influence local-level decision-making. The City Council adopted the CAP Work Plan 2020 in November 2014, resulting in a small implementation window between the work plan adoption and development of this first biennial monitoring report. Notwithstanding the limited proposed CAP modification, it is recommended that CAP implementation continue as described in the updated CAP Work Plan 2020.

### 4.1. Key Initiatives for Next Biennial Reporting Cycle

As discussed in **Chapter 3**, the City has made significant early progress in implementing the reduction measures as identified in the CAP Work Plan 2020. Many actions were completed and implementation is ongoing for others. Priorities for the next two-year work plan cycle will include a focus on three key initiatives and work on CAP policy related study items.

#### 4.1.1. Up and Coming Initiatives

##### *CALGreen and Green Building Policies*

The California Green Building Standards Code (CALGreen; part 11 of Title 24) is a statewide green building code. CALGreen includes both mandatory and voluntary measures to enhance the design and construction of buildings to have a positive environmental impact. CALGreen measures address: planning and design, energy efficiency, water efficiency and conservation, material conservation, and environmental quality.



The State's updated code, anticipated to be released by July 2016, will likely have new and changed measures that provide a greater reduction in environmental impacts across all areas. The City plans to adopt the mandatory measures of this new code into its local building ordinance, with some minor

changes and modifications, to be effective on or before January 1, 2017. During 2017, the City will conduct a review and update the City's green building program that will include an evaluation of the alignment of the green building incentives with CALGreen voluntary measures, LEED, and Build It Green. The review of the City's green building program will also evaluate implementation of a series of CAP actions (**Table 4-1**) related to encouraging green building practices in the community. Additionally, the 2017 green building program update will also evaluate opportunities that are not specifically CAP related, such as zero net energy building policies, and other potential considerations.

**Table 4-1. Reduction Measures to be evaluated with next Green Building Program Update**

ACTIVITY ID	REDUCTION MEASURE DESCRIPTION
OS-3.3	Promote tree planting on private property through incentives and support programs.
EC 4.3	Create ordinance to facilitate energy efficiency improvements in non-residential buildings that may include energy performance reports, time of sale upgrades, and other innovative partnerships.
EC 5.1	Require new construction and major remodels to install interior real-time energy monitors.
EP 2.1	Require new homes and businesses and major remodels to be "solar ready" by pre-wiring for solar water heating and solar electricity.
WC 2.1	Require new development to reduce potable indoor water consumption by 30% (Tier 1 CALGreen) and outdoor landscaping water use by 40%.
OR 1.2	Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.

## Commercial Energy Conservation

Commercial/Industrial Energy makes up 39% of GHG emissions. Significant efforts are currently underway to address and encourage residential energy efficiency. The City plans to expand its energy efficiency outreach efforts to target commercial and industrial facilities (**CAP actions EC-4.1, EC-4.2, EC-4.3, and EC-4.4**). The City will develop an expanded strategy to engage commercial property owners in energy efficient practices. This includes sharing information at potential milestone events (such as remodels) to encourage sharing of energy use and efficiency information. The City is initiating collaborations with realtors to educate them on energy efficiency upgrades that can be proposed to their clients at the time of sale. The City will also develop a plan for targeting commercial businesses, including larger consumers of energy, and assist them in addressing their energy use.



*The City's IGreenSunnyvale app, released at a launch event in January 2016 (shown here), allows users to record their sustainability actions and compete with other users. The City will be hosting friendly challenges among Sunnyvale employers, neighborhoods, and schools.*

## Adaptation Planning and Preparation

The City participated in the development of Silicon Valley 2.0<sup>10</sup> and intends to work with the County of Santa Clara to leverage Silicon Valley 2.0 data and resources to further guide the coordination and development of appropriate adaptation programs at the local or regional scales. The City will develop an internal plan for the implementation of measures related to climate change adaptation and building local resilience (**CAP actions A-1.1, A-2.1, A-2.2, A-3.1, A-3.2, A-4.1, and A-4.2**). The City will also continue to collaborate with regional entities, including Santa Clara County, the Santa Clara Valley Water District, the Association of Bay Area Governments (ABAG), and others in contributing information to and providing support for regional-scale adaptation strategies or programs.

<sup>10</sup> Silicon Valley 2.0 is a decision-support tool developed by the County of Santa Clara to aid in the development of strategies and measures to address climate resilience.

### 4.1.2. CAP Study Items

There are also CAP reduction measures that require further study to determine an implementation approach, specify any resulting policy changes, and to better understand funding implications. These study items were identified in the original CAP Work Plan 2020 and are highlighted in **Table 4-2** along with planned timing for conducting the study. In most cases, the resources needed to conduct the study are already budgeted or work will be prioritized within available staffing resources.

**Table 4-2. Study Items identified in the CAP Workplan**

ACTION ID	REDUCTION MEASURE DESCRIPTION	LEAD DEPT.	YEAR
LUP 1.6	Designate street parking stalls near commercial and multi-family developments for efficient/alternatively fueled vehicles	DPW	2017
EC 5.1	Require new construction and major remodels to install real time energy monitors	CDD	2017
WC 2.2	Revise development standards to ensure use of grey water, recycled water, and rainwater catchment	CDD	2017
OVT 1.4	Increase the number efficient or alternatively fueled vehicles in City fleet	DPW/ESD	2016-2017
CTO 4.2	TDM Program for City staff	DPW	2018
CTO 2.2	Require secure bike parking at public events and large private events	LCS	2018
LW 1.2	Ban single-use water bottles at public events permitted by City	ESD	2019
LUP 1.3	Parking management tools for residential use such as decreased/flexible standards, unbundled parking, and shared parking	CDD	2019
OVT 1.6	Zoning or other incentives to encourage alternative fueling stations (biodiesel, CNG, etc)	CDD	2020
EC 6.1	Require all new and resurfaced parking lots to be high reflectivity	DPW	2020
LUP 1.1	Build and maintain electronic parking management system for downtown parking structures and beyond	DPW	2020

ACTION ID	REDUCTION MEASURE DESCRIPTION	LEAD DEPT.	YEAR
LUP 3.1	Revise zoning code to allow small-scale commercial urban farms in residential areas	CDD	2020
LUP 3.4	Locally supplied food purchasing policy	FIN/ESD	Long term (2020+)
CTO 2.6	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only	LCS	Long term (2020+)
OVT 3.2	Deploying intelligent transportation system measures for managing traffic at large scale construction or major City and private events	DPW	TBD

## 4.2. Revisions to CAP Work Plan 2020

CAP Work Plan 2020, adopted in November 2014, identified the lead department responsible for implementation of each CAP action, implementation status, funding sources. The work plan laid out the proposed schedule for implementation of the near-term and mid-term CAP actions over the six-year time frame from 2014-2020. As required by this work plan, the current biennial report provides an updated version of the CAP Work Plan 2020 implementation matrix, which has been revised based on 2014-2015 CAP implementation results and incorporates the latest information available on funding. The revised Work Plan 2020 also lays out an updated timeline for implementation between 2016 and 2020.

The next biennial report, scheduled for 2018, will document progress made on CAP implementation between January 2016 and December 2017. As with the current report, data reported will be the most recent data available.

A complete revised Work Plan 2020 matrix is presented in Appendix A. Revisions to remaining implementation steps, funding status, funding sources, and other notes are noted in blue italicized text. Implementation timelines have also been revised as appropriate; grey dots represent the scheduled year of implementation per the original Work Plan 2020, black dots represent unchanged implementation years, while blue dots represent new years for which implementation has been scheduled. The revised Work Plan also reflects the proposed changes to CAP actions noted in section 3.3.1, Table 5.



### 4.3. Updates to Funding Strategies

The implementation of Sunnyvale's CAP remains largely unchanged from the first edition of the Work Plan 2020, adopted in November 2014. The City's CAP implementation continues to be funded by the following sources:

- *The General Fund* covers operating expenses for basic government services such as public safety, street maintenance, library services, and maintenance of parks and open space.
- *Enterprise Funds* continue to be available from programs or activities that are fully or partially funded by user fees, such as water supply and distribution, wastewater treatment, solid waste management, and the Development Enterprise Fund.
- *Grant funding* may be available through regional, state, or federal initiatives. For example, California receives significant revenues from the proceeds of the state-administered Cap and Trade program. This funding is distributed to numerous state agencies to support sustainability and GHG reduction activities in the form of grants that could be available to cities, such as Sunnyvale.



#### 4.3.1. Funding for Initial CAP Implementation

With the FY 15-16 Projects Budget, the City Council approved funding from the General Fund to support the first two years of CAP implementation. This project budget includes funding for:

- consultant support for tracking, monitoring, and reporting;
- support to evaluate and develop policy and program approaches for actions identified broadly in the CAP, such as climate adaptation, resiliency planning, and response coordination;
- development and implementation of a comprehensive community engagement strategy focused on schools, designed to increase participation in CAP programs such as energy efficiency, renewable energy, and alternative transportation modes; and

- limited resources for grant proposal development focused on bringing in external funding for CAP initiatives.

Some CAP actions have significant resource needs and are managed as discreet projects (e.g., Recycled Water or Community Choice Energy), while many actions have smaller resource needs that can be flexibly prioritized across one another as implementation progresses. The approved budget is intended to support the aggregate of the smaller actions to be implemented during FY 15-16/16-17. Funding needed for CAP implementation beyond FY 16-17 will be brought forward for City Council consideration in future budget cycles and as study items are completed and funding needs are identified.

### 4.3.2. Update on Grant Funding Opportunities

During this reporting period, the City applied for and participated in several regional grants that support CAP implementation including:

- The 2014 California Energy Commission Grant through the Bay Area Climate Collaborative for public EV charging stations installations in Sunnyvale.
- 2014 Sustainable Communities Planning Grant through the County of Santa Clara for Driving to Net Zero, Decarbonizing Transportation in Silicon Valley, which will support Sunnyvale's efforts to expand alternative fuel adoption. This includes, but is not limited to, the development of an EV Charging Station siting plan and guidance and resources for municipal fleet conversion.
- The City and the Santa Clara Valley Water District (SCVWD) received a grant from the California Department of Water Resources to expand the existing recycled water pipeline from Sunnyvale to the Apple 2 campus in Cupertino along Wolfe Road. Construction is anticipated to commence in 2016.





- The City applied but was not selected for the 2014 Rockefeller Foundation 100 Resilient Cities Grant, which would have supported the City's efforts to develop a comprehensive Resiliency Plan.

Cap and Trade Revenue will continue to be made available to support climate change efforts through competitive grants. While the final expenditure plan for the 2016-2017 budget will not be available until the State adopts a budget in the summer of 2016, the proposed Cap and Trade expenditure plan anticipates \$3.09 billion in Cap and Trade revenue. The City could potentially apply for grants to fund programs supported by Cap and Trade revenue to offset the cost of local CAP implementation. Potential programs and their proposed 2016-2017 allocations are shown in **Table 4-3**.

**Table 4-3. Potential Grant Opportunities from Cap and Trade Revenue**

DEPARTMENT	PROGRAM	PROPOSED 2016-2017 ALLOCATION
Strategic Growth Council	Affordable Housing and Sustainable Communities Program	\$400 million
Caltrans	Low Carbon Road Program	\$100 million
California Air Resources Board	Low Carbon Transportation and Fuels	\$100 million
California Energy Commission	Biofuel Facility Investments	\$100 million
Department of Food & Agriculture and Department of Water Resources	Water and Energy Efficiency	\$30 million
California Natural Resources Agency	Urban Greening	\$20 million
Department of Community Services & Development	Energy Efficiency Upgrades and Weatherization	\$75 million
Total		\$825 million

The City will continue to monitor Cap and Trade revenue and other grant funding opportunities. The City will pursue additional funding through grants, when possible, for implementing specific projects that align with the implementation of CAP actions.

## 5 – References

Association of Bay Area Governments (ABAG). 2011. *Taming Natural Disasters: Multi-jurisdictional Local Hazard Mitigation Plan for the San Francisco Bay Area*. 2010 update of the 2005 plan. Available online at: <http://resilience.abag.ca.gov/2011mitigation/>. Accessed March 10, 2016.

Bay Area Air Quality Management District (BAAQMD). 2011. *California Environmental Quality Act: Air Quality Guidelines*. Updated May 2011. Available online at: <http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/CEQA/BAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en>. Accessed March 18, 2016.

Bay Area Air Quality Management District (BAAQMD). 2010. *GHG Plan Level Quantification Guidance*. April 5, 2010. Available online at: [http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ghg-quantification-guidance\\_5\\_3\\_10.pdf](http://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ghg-quantification-guidance_5_3_10.pdf). Accessed March 18, 2016.

California Air Resources Board (CARB), California Climate Action Registry, ICLEI – Local Governments for Sustainability, and The Climate Registry. 2010. *Local Government Operations Protocol – For the Quantification and Reporting of Greenhouse Gas Emissions Inventories*. Version 1.1. May 2010. Available online at: [http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo\\_protocol\\_v1\\_1\\_2010-05-03.pdf](http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf). Accessed January 4, 2016.

California Air Resources Board (CARB). 2009. *Recommendations of the Regional Targets Advisory Committee (RTAC) Pursuant to Senate Bill 375*. Available online at: <http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf>. Accessed March 10, 2016.

City of Sunnyvale. 2010. *Waste Characterization Report*. Available online at: [http://sunnyvale.ca.gov/Portals/0/Sunnyvale/ESD/Recycling/2010\\_Sunnyvale\\_Waste%20Characterization\\_Study.pdf](http://sunnyvale.ca.gov/Portals/0/Sunnyvale/ESD/Recycling/2010_Sunnyvale_Waste%20Characterization_Study.pdf). Accessed February 18, 2016.

City of Sunnyvale. 2016. *Sunnyvale Municipal Code, Section 19.22.035*.

Cooley, H., and R. Wilkinson. 2012. *Implications of Future Water Supply Sources for Energy Demands*. WateReuse Research Foundation. <http://pacinst.org/wp-content/uploads/2013/02/report19.pdf>. Accessed January 16, 2016.

ICLEI - Local Governments for Sustainability USA. 2012. *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. Version 1.0, October 2012.

ICLEI – Local Governments for Sustainability. 2016. *ClearPath*. Available online at: <http://icleiusa.org/clearpath/>. Accessed March 18, 2016.

Intergovernmental Panel on Climate Change (IPCC). 2005. *Climate Change 1995 – The Science of Climate Change: Contribution of Working Group I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. [http://ipcc.ch/ipccreports/sar/wg\\_I/ipcc\\_sar\\_wg\\_I\\_full\\_report.pdf](http://ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_report.pdf)

IPCC. 2013. *The Physical Science Basis: Contributions of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. <http://ipcc.ch/report/ar5/wg1/>

The Hoyt Company. *Sunnyvale Transportation Demand Management Tool Kit*. December 1999. Available online at: <http://www.pmcworld.com/client/sunnyvale/documents/4-11-11/TDM-Tool-Kit.pdf>. Accessed March 16, 2016.

World Resources Institute (WRI), C40 Cities, and ICLEI – Local Governments for Sustainability. 2014. *Global Protocol for Community-Scale Greenhouse Gas Emission Inventories: An Accounting and Reporting Standard for Cities*. Available online at: [http://ghgprotocol.org/files/ghgp/GHGP\\_GPC.pdf](http://ghgprotocol.org/files/ghgp/GHGP_GPC.pdf). Accessed January 4, 2016.

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
OS-1	OS-1.1	Achieve and maintain an open space to population ratio of 5.5 acres per 1,000 residents.	DPW	CDD	O	A revised park standard was recently adopted by Council. A study Issue would be required to increase it to meet the CAP action item. Due to low emissions reduction staff has moved this from near term to long term to be reevaluated prior to 2020. Current open space estimate is at 5.6 acres per capita	Very High	Park in-lieu fees. Dedication.							●		64 New acres of park land	20
OS-2	OS-2.1	Provide availability and access to outdoor space for recreation or social purposes, including access to public open spaces on privately owned property such as retail shopping centers.	CDD	DPW	O	May also require zoning code amendments for non-residential uses.	Minimal	Development Enterprise Fund	Already budgeted.		●	●	●	●	●	●	Supportive Measure	Supportive Measure
OS-3	OS-3.1	Continue to implement the City's Tree Preservation requirements.	DPW	CDD	O	Implementation ongoing.	Medium	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●	7,400 trees planted	300
OS-3	OS-3.2	Develop and implement canopy coverage requirements for City-owned parking lots, with exceptions for solar installations.	DPW	CDD	O	Urban Forestry Management Plan addresses canopy coverage in private parking lots and includes monitoring of canopy cover in parking lots subject to the City's parking lot shading standards. Developing standards for public parking lots may be reviewed as part of study to revise Municipal Code requirements related to City trees.	Medium	General Fund	Already budgeted.	●	●	●	●	●	●	●		
OS-3	OS-3.3	Promote tree planting on private property through incentive and support programs.	CDD	DPW	I	Study needed to develop incentive program. Currently promote parking lot shading requirement. Will be balanced and prioritized with other non-CAP related work. <i>Included in both Lawrence Station Area Plan and Peery Park Specific Plan. Can potentially be incorporated into City's Green Building code.</i>	Medium	Development Enterprise Fund/General Fund	Already budgeted (Planning staff time for studies).			●	●	●	●	●		
OS-3	OS-3.4	Expand existing park, open space, and boulevard tree inventory through the replacement of trees with a greater number of trees when trees are removed due to disease, park development, or other reasons.	DPW	None	O	Consolidated General Plan and the Urban Forestry Management Plan address tree replacement.	Medium	General Fund	Already budgeted.	●	●	●	●	●	●	●		
OS-3	OS-3.5	Clarify codes and policies to maximize the preservation of the largest longest-living trees, and ensure the expansion of the urban forest over time as appropriate for the site.	CDD	DPW	O	City Municipal Code already addresses this. Can be strengthened and could be done as part of study of municipal codes requirements related to City Trees per OS-3.2. <i>Urban Forest Management Plan is in place &amp; includes action for private properties as well. Needs additional implementation.</i>	Medium	General Fund	Already budgeted.	●	●	●	●	●	●	●		
EC-1	EC-1.1	Replace City-owned streetlights and park and parking lot lighting with energy-efficient lighting such as light-emitting diode (LED) or induction lights as technology becomes more affordable and when return on investment is less than five years.	DPW	None	O	New lights due to private development and City projects are LED. <i>Council approved funding to retrofit remaining city-owned streetlights by 2017.</i>	Very High	General Fund	Funded.			●	●				75% Streetlights retrofit to LED	260
EC-1	EC-1.2	Participate in an illumination bank that provides loans for upfront cost of energy-efficient lighting technologies to be paid back over three to seven years.	FIN	ESD	N	<i>Clarified intent of program and included in recommendations for revising activity description.</i>	Unknown	General Fund	Research can be absorbed by existing staff and will determine future funding needs.					●				

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
EC-1	EC-1.3	Require new private parking lot lighting to use energy efficient lighting technologies.	CDD	None	O	Currently as COA for discretionary projects. Title 24 requires this already.	Minimal	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EC-2	EC-2.1	Evaluate and update the 2009 Zoning Code for Green Buildings for single-family, multi -family, and non-residential building construction and major remodels every three to five years.	CDD	None	O	In Process. Currently <i>implementing</i> third update to Green Building Code. Ongoing updates as directed by Council. <i>Fourth update will be in 2017 after CALGreen Update is released.</i>	Low	Development Enterprise Fund/General Fund	Already budgeted.	●			●			●	<i>15% improvement over minimum Title 24 requirements</i>	<i>4,090</i>
EC-2	EC-2.2	Continue to require energy efficient siting of buildings. Buildings should be oriented and landscape material should be selected to provide maximum energy efficiency for the buildings.	CDD	None	O	Citywide Design Guidelines include site design guidelines to consider energy efficiency in the siting of buildings (1. B15). To strengthen CAP measure would require study issue to evaluate codes and design guidelines. Provide training, Create handouts.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EC-2	EC-2.3	Continue to provide incentives for new construction <del>and remodels</del> to adhere to a higher green building standard than required by the City.	CDD	None	O	Ongoing when projects apply for high FAR as a Green Building Code incentive.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EC-3	EC-3.1	Establish a residential energy conservation program that encourages or incentivizes homeowners to perform energy and water audits, with an emphasis on leveraging homeowner decision-making during home sale, purchase, and remodel.	ESD	CDD	O	<i>Working with County and Silicon Valley Association of Realtors to engage real estate professionals.</i>	Medium-High	General Fund	<i>Funded through 2-yr Projects Budget for CAP program implementation.</i>		●	●	●	●	●	●	15% residential participation in PACE	<i>4,360</i>
EC-3	EC-3.2	Participate in a Property Assessed Clean Energy (PACE) or similar financing program to offer low-interest loans to residents for energy-efficiency upgrades.	ESD	None	O	CA First Rolling out program in Sunnyvale beginning in Aug '14. <i>Monitoring progress and evaluating to determine if additional programs are needed.</i>	Low	General Fund	<i>Funded through 2-yr Projects Budget for CAP program implementation.</i>	●	●	●	●	●	●	●		
EC-4	EC-4.1	Consistent with California AB <del>802 1103</del> , <del>require all nonresidential building owners to disclose building energy consumption and promote the availability of building energy ratings to building owners and support other energy efficiency efforts resulting from AB 802 upon sale or lease of building.</del>	<i>ESD</i>	CDD	N	<i>AB 1103 was repealed and replaced by AB 802. CEC working on regulations to implement AB 802. However, AB 802 has deleted the requirement for building owners to disclose energy information to prospective buyers, lessees, or lenders. Therefore, action is revised to broaden th approach.</i>	Low	General Fund	Projects Budget Proposal for additional outreach support.	●	●	●	●	●	●	●	10% participation in PACE	53,190
EC-4	EC-4.2	Participate in a Property Assessed Clean Energy (PACE) or similar financing program to offer low-interest loans to businesses for energy efficiency upgrades.	ESD	OCM, CDD	O	CA First Rolling out program in Sunnyvale beginning in Aug '14. <i>Monitoring progress and evaluating to determine if additional programs are needed.</i>	Low	General Fund	<i>Funded through 2-yr Projects Budget for CAP program implementation.</i>	●	●	●	●	●	●	●		
EC-4	EC-4.3	Create an ordinance to facilitate energy efficiency improvements in non-residential buildings through incentives and regulations that may include energy performance reports, <del>time of sale upgrades</del> , and/or innovative partnerships to reduce energy use.	CDD	ESD, OCM	O	Included in parts of Green Building code. Addresses existing buildings not new construction. Will require study Issue to expand beyond Green Building code. <i>Consider for study in 2017 with Green Building program update.</i>	High	Development Enterprise Fund General Fund	Already budgeted.				●	●	●	●		
EC-4	EC-4.4	Identify businesses that are likely to be the largest consumers of energy within the city and target City outreach to these businesses.	ESD	OCM	N	<i>Need to determine how to identify customers and develop outreach and engagement strategy. Will coordinate with Office of Economic Development.</i>	Low	General Fund	Projects Budget Proposal.				●					

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
EC-5	EC-5.1	Require new construction and major remodels to install interior real-time energy monitors.	CDD	None	N	This is not currently part of the California or Sunnyvale green building codes. Can determine if study issue needed for 2016-2019. Codes may require this by then. Assumes minimal staff time to outreach to businesses. An outreach measure to educate about CAP and programs available to encourage reduction in energy costs.	Low	Development Enterprise Fund	Already budgeted (Planning staff time for studies).				●	●	●	●	60% existing and 75% of new homes; 50% existing and 75% new businesses participate in a monitoring program	12,210
EC-5	EC-5.2	Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.	ESD	CDD, OCM	N	Need to research programs and work with PGE, Silicon Valley Energy Watch, and County to develop program.	Medium-High	General Fund Grant Regional Program	Projects Budget Proposal.						●	●		
EC-5	EC-5.3	Inform the community of metering options, such as online applications and in-home monitors.	ESD	CDD	N	Included initial information as part of Energize Sunnyvale. Additional research into available applications and monitoring programs is needed. Develop additional outreach materials. Check in with Mountain View on their program.	Medium	General Fund Grant Regional Program	Funded through 2-yr Projects Budget for CAP program implementation.			●	●	●	●			
EC-6	EC-6.1	Require all new and resurfaced parking lots, sidewalks, and crosswalks to be made of materials with high reflectivity, such as concrete or reflective aggregate in paving materials.	DPW	None	I	Requires City to adopt a standard for highly reflective paving materials. May require a Study Issue unless State or other regional agency adopts a standard. Study issue would be forwarded in 2020 or later unless Council sets new priority.	Low									●	100% of all new parking lots, crosswalks, and sidewalks are made of high albedo content	560
EC-6	EC-6.2	Require new multi-family buildings and re-roofing projects to install 'cool roofs' consistent with the current California Green Building Code (CalGreen) standards for commercial and industrial buildings.	CDD	None	O	This is already a requirement for multi-family projects. Consider for single-family and review different aesthetic standards for residential roofs as part of 2017 Green Building program upgrade.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EC-6	EC-6.3	Commit to using a warm aggregate mix for all asphalt patching, overlay, and reconstruction.	DPW	None	N													
EC-6	EC-6.4	Consider the lifespan and embedded GHG content of pavement materials for public projects.	DPW	None	N													
EP-1	EP-1.1	Create a Community Choice Aggregation (CCA) program for the City of Sunnyvale in order for the City to take control of power generation for its residents and businesses.	ESD	OCM	I	Completed Study Issue. Sunnyvale is a sponsoring partner in Silicon Valley Community Choice Energy Partnership and adopted CCE resolution in January 2016. Program launch scheduled for Winter 2016.	Medium-High	General Fund Partner Funding	Feasibility Study and Start-up funding approved for Sunnyvale's contribution approved.	●	●	●	●				75% "light green" participants 5% "dark green" participants "Light green" option delivers 50% renewable energy "Dark green" option delivers 100% renewable energy 20% opt-out of CCE	77,030
EP-2	EP-2.1	Require new homes and businesses and major remodels to be “solar ready” by pre-wiring for solar water heating and solar electricity.	CDD	None	N	There is currently no code requirement for pre-wiring. The current building code addresses reserving "solar ready area" on roof tops of some projects such as single family projects of 10 or more units and low rise apartments of 10 or fewer stories. Study to be coordinated with Green Building Update 2017.	Low	Development Enterprise Fund	Already budgeted.				●	●	●	●	15% residential participation rate 5% non-residential participation rate	24,580



Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
EP-2	EP-2.2	Participate in a Property Assessed Clean Energy (PACE) or similar financing program to offer low-interest loans to residents and businesses for renewable energy installations.	ESD	CDD	O	CA First Rolling out program in Sunnyvale beginning in Aug '14. <i>Monitoring progress and evaluating to determine if additional programs are needed.</i>	Low	General Fund Grant Regional Program	<i>Initially, funded through 2-yr Projects Budget for CAP program implementation. On-going funding to be identified.</i>	●	●	●	●	●	●	●		
EP-2	EP-2.3	Prevent buildings and additions from shading more than 10% of roofs of other structures.	CDD	None	O	This is already a code requirement. <i>Study issue in 2016 (CDD #16-13) is considering solar access requirements.</i>	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EP-2	EP-2.4	Continue to allow and encourage solar facilities above paved parking areas.	CDD	None	O	Current code allows for this.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EP-2	EP-2.5	Maintain incentives for alternative energy installations in new and existing development, including solar and small-scale wind turbines.	CDD	None	O	Current code provides a FAR incentive.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
EP-2	EP-2.6	Advocate for the development of a regional or statewide feed-in tariff that further encourages the development of mid-sized renewable energy installations.	ESD	None	<i>N</i>	Monitor legislative and CPUC rule making processes and engage as appropriate.	Low	General Fund	<i>Already budgeted.</i>	●	●	●	●	●	●	●		
WC-1	WC-1.1	Prepare a feasibility study for 'purple pipe' (reclaimed water) capture, distribution and safe use.	ESD	None	C	Study complete. Calculate GHG reduction from the stages of the plan. Check in on status and determine if new calculations and update of goal is needed.	Very High	Wastewater Management Fund	NA (Study is complete.)		●						<i>15% of the water Sunnyvale uses is reclaimed water</i>	<i>180</i>
WC-1	WC-1.2	Promote “purple pipe” (reclaimed water) infrastructure in new construction or major renovation in preparation for a growing, usable network.	ESD	CDD	O	Received grant funds in partnership with SCVWD to extend system (Wolf Rd Extension).	Very High	Wastewater Management Fund Grant and partner funds	Projects Budget proposal and grants.	●	●	●	●	●	●	●		
WC-1	WC-1.3	Create a purple pipe network for citywide use of recycled water for irrigation and other outdoor purposes.	ESD	None	O	Received grant funds in partnership with SCVWD to extend system (Wolf Rd Extension).	Very High	Wastewater Management Fund Grant and partner funds	<i>Grant obtained for Wolfe Rd expansion.</i>			●	●	●	●	●		
WC-1	WC-1.4	Create flexible provisions and encourage residents and businesses to collect rainwater to use for irrigation purposes.	ESD	CDD	O	Rain barrel rebate program started in 2015 as part of Drought Response efforts.	Low	Water Supply and Distribution System Fund	<i>Already budgeted.</i>		●	●						



Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
WC-2	WC-2.1	Require new development to reduce potable indoor water consumption by 30% (Tier 1 CALGreen) and outdoor landscaping water use by 40%.	CDD	ESD	O	Study, to be coordinated with Green Building Update 2017.The City chose to use Build It Green instead of Tier 1 CalGreen in Sunnyvale's green building program. Will need to evaluate the % reduction from Build It Green to determine if it reaches the 30% reduction in potable indoor water consumption same as Tier 1 Cal Green. May require a study if City chooses to change our green building code. Our WELO landscaping code gets us to about a 20% reduction in new projects based on the state program it was based on so a study is needed to see how a higher percent can be reached. Developers can also voluntarily choose some landscape points under Build it Green but again we need to evaluate if it gets us to 40% reduction when used voluntarily. <i>Indoor use is part of CALGreen standards.</i>	Low	Development Enterprise Fund	Already budgeted.				●	●	●	●	63 million gallons in water savings	640
WC-2	WC-2.2	Revise development standards to ensure the use of greywater, recycled water, and rainwater catchment systems is allowed in all zones.	CDD	ESD	O	Requires a study. CDD has setback and height standards for accessory structures in all zones. The zoning code does not specifically address any water quality or safety standards for dealing with water that is reclaimed or reused on site. Additional standards specific to these systems may need to be identified and evaluated for possible adoption.	Low	Development Enterprise Fund	Already budgeted.			●	●	●	●	●		
WC-2	WC-2.3	Require new open space and street trees to be drought tolerant.	CDD	DPW	O	Recently adopted Urban Forestry Management Plan addresses this and requires low-water use trees.	Low	General Fund	Already budgeted.	●	●	●	●	●	●	●		
WC-2	WC-2.4	Implement the City's Urban Water Management Plan to facilitate a 20% reduction in per capita water use by 2020.	ESD	None	O	The UWMP has been adopted. Implement Plan.	Low	Water Supply and Distribution System Fund	Already budgeted.	●	●	●	●	●	●	●		
LW-1	LW-1.1	Reduce the use of plastic bags at grocery stores and convenience stores in the community through incentives or requirements.	ESD	None	O	Ordinance is currently in place.	Low-Medium	Solid Waste Management Fund	Already budgeted.	●	●	●	●	●	●	●	Supportive Measure	Supportive Measure
LW-1	LW-1.2	<i>Ban the sale or dispersal of disposable, single use plastic water bottles at public events permitted by the City.</i>	ESD	None	N	<i>Was originally identified as a long-term measure and have accelerated to conduct study in 2019.</i>	Low-Medium	Solid Waste Management Fund	Study Issue to determine implementation costs.						●	●		

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
LW-1	LW-1.3	Ban the use of expanded polystyrene (EPS) take-out containers at restaurants and fast food facilities.	ESD	None	O	Council adopted ordinance in 2013 to ban EPS use by food providers by April 2014 and ban retail sale of EPS food containers by April 2015. Staff is currently doing outreach and enforcement of food providers and stores <i>found not to be in compliance</i> .	Low-Medium	Solid Waste Management Fund	Already budgeted.	●	●	●	●	●	●	●		
LW-2	LW-2.1	Require multi-family homes to participate in the City's Multi-family Recycling Program	ESD	None	O	<i>Program in place. Continuing to conduct outreach and work with properties.</i>	Medium	Solid Waste Management Fund	Already budgeted.	●	●	●	●	●	●	●	1.5 lb/day disposal rate	26,690
LW-2	LW-2.2	Select materials to be targeted for diversion and diversion methods, services, or technologies based on the results of the Zero Waste Strategic Plan.	ESD	None	O	Current (2014) diversion is 64% . On April 23, 2013, Council adopted staff recommendation to target diversion levels of 70% by 2015, 75% by 2020 and 90% by 2030. Staff is currently implementing various measures (see RTC 13-085).	Very High	Solid Waste Management Fund	Some funding already budgeted. Projects Budget Proposal in future years, if needed.	●	●	●	●	●	●	●		
OR-1	OR-1.1	Partner with the Bay Area Air Quality Management District to re-establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers.	ESD	None	N	Complete Leaf Blower Ban Study Issue and offered voluntary pilot exchange/rebate program with minimal participation. BAAQMD currently not offering rebate program. Will monitor BAAQMD program development for partnership opportunities.	Low	General Fund	<i>Projects Budget Proposal, grants, or partner funding.</i>	●	●	●	●	●			25% of leaf blowers and lawn mowers are exchanged	30
OR-1	OR-1.2	Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.	CDD	None	N	Study, to be coordinated with Green Building Update 2017.	Low	Development Enterprise Fund	Already budgeted.				●					
OR-1	OR-1.3	In project review, encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	CDD	ESD	O	<i>CDD is implementing Municipal</i> Water Efficient Landscape Ordinance ( <i>MWELO</i> ) in 2016. Build It Green points are gained for reduced turf.	Low			●	●	●	●	●	●	●		
OR-2	OR-2.1	Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions.	<i>DPW</i>	DPW, DPS	O	Actions have been added as COAs of discretionary projects through CDD. <i>DPW has included in General Provisions for public projects (starting in 2016).</i>	Minimal	Development Enterprise Fund for private development.	Already budgeted.	●	●	●	●	●	●	●	40% of construction equipment is efficient or alternatively fueled; Local idling restrictions are met 50% of the time	7,190
<del>OR-2</del>	<del>OR-2.2</del>	<del>Construction equipment must be maintained per manufacturer's specifications</del>	<del>DPW</del>	<del>DPS</del>	<del>O</del>	<del>Actions have been added as COAs of discretionary projects through CDD. DPW has included in General Provisions for public projects (starting in 2016).</del>	<del>Minimal</del>	<del>Development Enterprise Fund</del>	<del>Already budgeted.</del>	<del>●</del>	<del>●</del>	<del>●</del>	<del>●</del>	<del>●</del>	<del>●</del>	<del>●</del>		

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
OR-2	OR-2.3	Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: a. Substitute electrified or hybrid equipment for diesel- and gasoline-powered equipment where practical. b. Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel. c. Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment. d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.	CDD	DPW	O	Actions have been added as COAs of discretionary projects through CDD. <i>Added to DPW site development specifications in 2015.</i>	Minimal	Development Enterprise Fund	Operating Budget Proposal, if needed for enforcement.	●	●	●	●	●	●	●		
CA-1	CA-1.1	Create a structure or partner with other groups for volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.	ESD	HR/NOVA	O	<i>Energize Sunnyvale has engaged community volunteers to support energy efficiency outreach.</i> Include in development comprehensive CAP Community Engagement Program, identify key outreach strategies including how leverage and use volunteers or other organizations to engage the community.	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>	●	●	●	●	●	●	●	Supportive Measure	Supportive Measure
CA-1	CA-1.10	Use the City's Sustainability Commission and outreach staff as a structure to coordinate with other groups for volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.	ESD	None	O	Coordinate with Sustainability Commission. <i>Proposed Budget Issue to establish Sustainability Speaker Series starting in FY 2016-2017.</i>	Low	General Fund	<i>16-17 Budget Issue Items for Sustainability Speaker Series</i>	●	●	●	●	●	●	●		
CA-1	CA-1.11	Actively engage with Sunnyvale businesses to identify areas for GHG reduction and financial savings.	ESD	OCM	N	Create Program. Collaborate with Economic Development.	Medium-High	General Fund	Projects Budget Proposal.		●	●	●	●	●	●		
CA-1	CA-1.2	Provide regular communication with schools, business, faith groups, community members and neighborhood groups to increase participation in the City's progress toward sustainability.	ESD	LCS	O	<i>Energize Sunnyvale has engage community and neighborhood groups to support energy efficiency outreach.</i> Expand on existing program and develop and provide information in support of sustainability initiatives.	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>	●	●	●	●	●	●	●		
CA-1	CA-1.3	Develop and encourage a mechanism for neighborhoods to share equipment and resources to improve sustainability.	ESD	LCS	I	<i>Working increase availability of DIY Home Energy Savings Kits, and have organized Repair Café events.</i> Identify and develop other opportunities.	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		
CA-1	CA-1.4	Provide a toolkit of resources, including web based efficiency calculators, for residents and businesses to analyze their greenhouse gas emissions in comparison to their neighborhood, the city, and the region.	ESD	OCM	N	<i>IGreenSunnyvale provides estimate of impacts of sustainable actions take. Review opportunities to create climate change web page with calculator.</i>	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		
CA-1	CA-1.5	Develop and implement a competitive greenhouse gas reduction program between groups of citizens in the City with an award component.	ESD	OCM	I	<i>IGreenSunnyvale provides platform for fostering competitions.</i>	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
CA-1	CA-1.6	Use sustainability initiatives within City operations to educate the community of ways to achieve sustainability by example.	ESD	CDD, DPW, LCS, FIN	I	<i>Quarterly Report/ReNews promotes City sustainability efforts. Ongoing improvements to sustainability/climate action web page in 2016.</i>	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		
CA-1	CA-1.7	Actively promote use of alternative modes of transportation as safe modes of travel. When applicable, promote on the City’s web site and publications about viable programs sponsored by 511, the Air District and other recognized agencies.	<i>DPW</i>	<i>ESD</i>	O	Create Climate Change Web Page. Use Quarterly Report to promote.	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>	●	●	●	●	●	●	●		
CA-1	CA-1.8	Through selected projects and efforts to improve City operations, demonstrate how sustainability efforts are possible and successful.	ESD	CDD, DPW, LCS	I	<i>Some sustainability efforts underway include conversion to LED streetlights, solar for City facilities, and EV charging station installations.</i>	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		
CA-1	CA-1.9	Make comparison an intrinsic part of consumption. Bring awareness of how our consumption compares to other communities, regions, and others in our neighborhood.	ESD	OCM	N	<i>Create CAP Monitoring dashboard and develop further opportunities for comparison.</i>	Medium-High	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>		●	●	●	●	●	●		
CA-2	CA-2.1	Recommend and advocate for schools to use the Air District curriculum or other programs for local school teachers to teach children about climate change, greenhouse gas emissions, and local actions.	ESD	LCS	<i>N</i>	Create sustainability outreach program with schools.	Medium	General Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>			●	●	●	●	●	Supportive Measure	Supportive Measure
CA-2	CA-2.2	Continue to provide and improve the bicycle driver education program for elementary, middle, and high school students.	DPS	None	O	Coordinate with DPS to continue Program	Medium	General Fund Grant Funds	Already budgeted.	●	●	●	●	●	●	●		
LUP-1	LUP-1.1	Build and maintain an electronic parking management system for City-owned parking structures in the downtown and consider expanding to other City lots in the downtown and in proximity to other commercial areas.	DPW	None	N	A study would be required to evaluate the costs and benefits of a parking management system. Technically the City does not currently own any downtown parking structures - two are owned by the RDA successor agency, others are privately owned.	Medium	General Fund	Projects Budget Proposal							●	10% reduction in parking provision compared to a parking generation rate <del>\$10 monthly parking cost</del>	<i>3,180</i>
LUP-1	LUP-1.2	Create maximum parking requirements and reduce minimum parking requirements for mixed-use development. Require parking lot sharing for mixed-use or commercial development with complementary hours of operation.	CDD	DPW	C	Done with recent parking code adoption. Will be reemphasized with mixed use tool kit.	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
LUP-1	LUP-1.3	Implement parking management tools for residential uses such as decreased or flexible standards, unbundled parking and shared parking plans.	CDD	DPW	I	Requires a Study. <i>Not yet Citywide. City already has maximum parking standards and has reduced minimum parking requirements.</i>	Low	Development Enterprise Fund	Already budgeted (Planning staff time for studies).						●	●		
LUP-1	LUP-1.4	Establish parking meters throughout downtown Sunnyvale to optimize parking availability and reduce unnecessary vehicle circulation.	DPW	None	N	The initial phase of parking meters for City owned parking spaces near Caltrain is funded and scheduled to be completed by the end of FY 14-15. Expanding to other areas would require a significant outreach effort to merchants and a study to identify	Medium	General Fund and Parking Assessment District	Initial phase already budgeted. Projects Budget Proposal to study and fund expansion.		●	●	●					

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
LUP-1	LUP-1.5	Retain a residential parking permit program for residential areas adjacent to commercial areas of the City where parking is in higher demand.	DPW	None	O	This is an existing program we plan to continue.	Medium	General Fund	Already budgeted.	●	●	●	●	●	●	●		
LUP-1	LUP-1.6	Designate street parking stalls in the vicinity of key commercial and multi-family residential locations for efficient or alternatively fueled vehicles.	DPW	None	N	A study would be needed to determine the location and number of spaces as well as cost for additional signage.	Medium	General Fund	Projects Budget Proposal pending Study Issue.				●	●				
LUP-2	LUP-2.1	Continue to plan for most new residential, commercial and industrial developments <i>to be developed</i> in specific plan areas, near transit, and close to employment and activity centers.	CDD	None	I	Changes were recently made to DSP to allow more housing. Studies underway. LSAP. Housing Element. Draft Land Use and Transportation Element.	Unknown	Development Enterprise Fund	Already budgeted (Planning staff time for studies).	●	●	●	●	●	●	●	15% of new housing units are deed-restricted below market rate	9,850
LUP-2	LUP-2.2	Continue to identify underutilized areas that can support higher density housing and mixed-use development.	CDD	None	I	Incorporate policies into General Plan or area plans such as Lawrence Station Area Plan and Precise Plan for El Camino Real.	Unknown	Development Enterprise Fund	Already budgeted (Planning staff time for studies).	●	●	●	●	●	●	●		
LUP-2	LUP-2.3	Facilitate the development of affordable housing near transit.	CDD	None	O	Utilizing State Density Bonus as incentive for affordable housing in new multi-family development in DSP. LSAP study in progress and Precise Plan for ECR to be updated.	Unknown	Development Enterprise Fund	Already budgeted (Planning staff time for studies).	●	●	●	●	●	●	●		
LUP-2	LUP-2.4	Expand the zoning opportunities for the construction of accessory dwelling units in existing residential neighborhoods near transit as a means to increase affordable housing near transit.	CDD	None	N	Study <i>is part of Housing Element update</i> .	Unknown	Development Enterprise Fund	Already budgeted (Planning staff time for studies).			●	●	●	●	●		
LUP-2	LUP-2.5	Continue to allow for the development of live/work spaces in commercial zoning districts and mixed-use residential zoning districts.	CDD	None	O	Currently evaluated on a case by case basis as part of development review. <i>Passed limited use design guidelines in 2015.</i>	Unknown	Development Enterprise Fund	Already budgeted (Planning staff time for studies).	●	●	●	●	●	●	●		
LUP-3	LUP-3.1	Amend the Zoning Code to allow small-scale, commercial urban farms to operate in residential areas.	CDD	None	N	Requires a Study Issue. Study Issue to be forwarded by 2020.	Low	Development Enterprise Fund								●	Supportive Measure	Supportive Measure
LUP-3	LUP-3.2	Ensure that every village core has opportunities for growing produce locally.	CDD	None	N	<i>Village Centers are a proposed feature of the Draft Land Use and Transportation Element estimated for consideration 2016.</i>	Low	Development Enterprise Fund	Already budgeted.									
LUP-3	LUP-3.3	Establish community gardens for public use.	DPW	None	O	Could be considered as part of planned park improvement projects. Already have one community garden (Charles Street Garden) developed in conjunction with Full Circle Farms. Haven't received requests for additional community gardens.	Low	General Fund or developer supported	Projects Budget Proposal.									
LUP-3	LUP-3.4	Develop and implement a purchasing policy that requires food and other appropriate materials purchased by the City to be purchased from as local a supply as possible.	FIN	ESD	N	<i>Study needed to determine scope and implications of such a policy.</i>	Low	General Fund.	Study Issue to determine implementation costs.									
LUP-4	LUP-4.1	Support the retention and expansion of local anchor and growth industries.	OCM	CDD	O	Continue efforts.	Unknown	General Fund	Already budgeted.	●	●	●	●	●	●	●	Jobs to housing ratio: 1.5	640
LUP-4	LUP-4.2	Review land use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.	CDD	None	I		Unknown	Development Enterprise Fund	Already budgeted.					●	●	●		

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
LUP-5	LUP-5.1	Encourage the establishment and even distribution of neighborhood-serving facilities such as day care providers, banking/ATM locations, markets and drug stores in existing residential, commercial, and industrial areas in order to reduce the need for vehicle trips.	CDD	None	I	Existing General Plan, MPSP and DSP policies support this. <i>LUTE will include policies for services near residents. Daycare study issue completed 2015.</i>	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●	See LUP-4	See LUP-4
LUP-5	LUP-5.2	Require new development to reduce the need for external trips by providing useful services/facilities on-site such as an ATM, vehicle refueling, shopping.	CDD	None	I	Existing General Plan, MPSP and DSP policies support this. <i>Mixed use design guidelines include such requirements.</i>	Low	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
CTO-1	CTO-1.1	Incorporate the provisions of AB 1358, the California Complete Streets Act of 2008, into all roadway design, construction and maintenance activities.	DPW	None	C	Done. We have adopted a complete streets policy.	Very High	General Fund	Completed. Will be implemented with Project Budgets for future roadway projects.	●	●	●	●	●	●	●	1.5% commute to work bicycle mode share	2,860
CTO-1	CTO-1.2	Implement the street space allocation policy in coordination with road reconstruction or resurfacing projects to provide road configurations that accommodate all travel modes.	DPW	None	O	This is current City policy. Some improvements done at time of new development. Striping studies by staff at resurfacing.	Very High	General Fund Developer funded	Already budgeted.	●	●	●	●	●	●	●		
CTO-1	CTO-1.3	Require new development to provide cross-parcel access and linkages from the development entrance to the public sidewalk system, transit stops, nearby employment and shopping centers, schools, parks, and other parcels for ease of pedestrian and cyclist access.	CDD	DPW	O	The Precise Plan for El Camino Real includes policy to minimize curb cuts and encourage use of shared driveways and pedestrian planning guidelines. Citywide Design Guidelines include policies to strengthen on-site pedestrian connections in new development. Accomplished through project review on case by case basis.	Unknown	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
CTO-1	CTO-1.4	Improve pedestrian safety and comfort through design elements such as landscaped medians, pedestrian level amenities, sidewalk improvements, and compliance with Americans with Disabilities Act (ADA) design standards, particularly for areas serving high volumes of traffic	DPW	None	O	City has completed Pedestrian Safety and Opportunity Study. Some implementation is ongoing.	Very High	Private developer funded as new projects occur	Private developer funded as new projects occur.	●	●	●	●	●	●	●		
CTO-1	CTO-1.5	Improve bicycle facilities and perceptions of comfort through pavement marking/coloring, physical separation specialized signs and markings, and other design elements.	DPW	None	O	City has completed Pedestrian Safety and Opportunity Study. Some implementation is ongoing.	Very High	General Fund Grants	Partially funded in Projects Budget. Need additional funding to complete and for maintenance.	●	●	●	●	●	●	●		
CTO-1	CTO-1.6	Require sidewalks to be a minimum of six feet wide in order to allow side by side walking at identified locations that currently serve high pedestrian traffic volumes, or locations planned to serve high pedestrian traffic.	DPW	None	O	New 6 foot DPW Standard in place.	Low	Private development Grants	Private developer funded as new projects occur.	●	●	●	●	●	●	●		
CTO-1	CTO-1.7	Actively promote intermodal linkages to and from regional transit options by establishing or improving well-defined, convenient intermodal hubs in downtown and specific plan areas. Work with city planning and the Valley Transportation Authority (VTA), Peninsula Corridor Joint Powers Board (PCJPB), the Advisory Committee on Accessibility (ACA), and others to establish best places for these locations.	DPW	CDD	O	Downtown multi-modal station complete. LSAP in progress. Linkages typically developed and paid for by developers.	Very High	Private development Grants	Already budgeted.	●	●	●	●	●	●	●		



Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
CTO-2	CTO-2.1	Require public areas and new development to provide bicycle parking consistent with the Valley Transportation Authority (VTA) Bicycle Technical Guidelines, as amended.	DPW	CDD	O	Bicycle parking requirements are already in the SMC. Standard COAs for new development require adhering to VTA guidelines.	Low	Development Enterprise Fund Private developer funded	Already budgeted.	●	●	●	●	●	●	●	Supportive Measure	Supportive Measure
CTO-2	CTO-2.2	Require secure bicycle parking at public and large private events.	LCS	DPW	N	Study required prior to implementation.	Low-Medium	General Fund Private event sponsors	If adopted by Council, funding would be borne by event sponsor.					●				
CTO-2	CTO-2.3	Increase awareness of the city's bicycle facilities by updating the city bicycle map to show locations of public and private bicycle parking, creating a web-based application for members of the public to identify locations of private parking, and establishing information kiosks at key city locations to provide maps and highlight alternative modes of transportation.	DPW	None	C	Updating the City's bike map is a funded project in FY 15-16. Creating a web based map would be a new project that is unfunded. A bike facilities map could potentially be accommodated with the GIS update being planned by including a publicly accessible bike layer.	Low-Medium	General Fund Grants	Already partially budgeted. <i>Funding to create web-based application to be identified.</i>		●							
CTO-2	CTO-2.4	Fully fund the City's bicycle and pedestrian improvement plans for completion by 2035.	DPW	None	O	Some projects already included in Projects Budget and are being implemented. Continue to identify projects and pursue grant and partner funding.	Very High	General Fund Grants Partner funding	Already partially budgeted in Projects Budget.	●	●	●	●	●	●	●		
CTO-2	CTO-2.5	Implement projects and programs to improve the safety of cyclists and pedestrians through increased enforcement of pedestrian right-of-way laws, removing crossing impediments, improving crossing time at signalized intersections for pedestrians and cyclists, requiring drive-through food establishments to serve bicyclists, and providing center refuge areas for pedestrians and bicyclists to pause when crossing arterials.	DPW	DPS	O	While some aspects of this could potentially be implemented there are about five different action items contained within this item. Widening arterials to accommodate refuge islands is unlikely to ever take place because of right-of-way constraints at intersections.	Very High	General Fund Grants and partner funding.	Already partially budgeted in Projects Budget.	●	●	●	●	●	●	●		
CTO-2	CTO-2.6	Create at least one day a year when a portion of streets and plazas is designated for pedestrian and/or bicycle access only.	DPW	None	N	This was proposed as a Council study and dropped due to high costs. Will require a Study Issue to determine location, outreach, and funding.	Very High	General Fund	Pending study issue.									
CTO-2	CTO-2.7	Support business efforts to plan and implement a bike-sharing program for major commercial and industrial areas.	DPW	None	N	The City would be happy to support a privately funded bike share program including use of the public right-of-way for bike storage. However since the City has no control over timing, this was suggested as a long term measure.	Very High											
CTO-3	CTO-3.1	Continue sponsoring projects to provide transit rider amenities at bus stops and rail stations.	DPW	None	O	Already completed Frances Street bus stops, and Caltrain station re-building. Improved access to the north Caltrain platform with two different projects. Participate in the VTA's bus shelter advertising program which provides bus shelters. Require developers to improve bus stops. Shelter program pays City money, one Caltrain platform access paid for by a developer. There are no definitive plans for future improvements. Future investments would be as opportunities arise and would be at the discretion of the City Council. <del>Certain improvements such as shelters</del>	Low	General Fund Grants	Some portions already funded. Seek grants/partnerships for additional actions.	●	●	●	●	●	●	●	80% new development participating in <del>GreenTrip program</del> trip reduction program <del>VTA transit ridership in Sunnyvale</del>	3,200

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
CTO-3	CTO-3.2	Work with the Valley Transportation Authority and neighboring jurisdictions to provide transit priority signal timing in order to decrease travel time.	DPW	None	O	Install equipment on signals and buses. Timing is unknown since VTA would be the project led. Signal priority would be included with El Camino BRT if implemented.	Low	General Fund	Already budgeted.	●	●	●	●	●	●	●		
CTO-3	CTO-3.3	Work with other agencies to provide High Occupancy Toll (HOT) lanes, and support expenditure of HOT lane revenue on projects that reduce vehicle miles traveled in Sunnyvale. Support regional congestion pricing measures.	DPW	None	O	Track and advocate as needed.	Low	General Fund	Already budgeted.	●	●	●	●	●	●	●		
CTO-3	CTO-3.4	Advocate for transit service improvements by area transit providers consistent with established performance standards, with an emphasis on coordinating public transit schedules and connections and for subsidies for a higher level of transit service and/or more transit passes for residents and/or employees.	DPW	None	O	Track and advocate as needed.	Low	General Fund	Already budgeted.	●	●	●	●	●	●	●		
CTO-3	CTO-3.5	<del>Partner with GreenTRIP and other local or regional organizations to implement trip reduction programs in new residential, commercial, and mixed use developments.</del> Require trip reduction programs in new residential, commercial, and mixed use development.	DPW	CDD	N	Create Program/Partnership. Add COA on New Projects.	Low	General Fund Partner Funding	Already budgeted.				●	●	●	●		
CTO-4	CTO-4.1	Require existing and future major employers to utilize a variety of transportation demand management (TDM) measures such as flexible work schedules, telecommuting, guaranteed rides home, low- or no-cost transit passes, parking "cash-out" incentives, and other programs that provide employees with alternatives to single-occupant commutes.	CDD	DPW	O	TDM is a requirement for new employment development. It is programmed and ongoing implementation is done at employers cost. City staff monitor TDM annual reports provided by employers. TDM programs are currently a typical condition of approval on large development projects. A project is underway to better measure program results. <i>Ongoing study issue in 2016.</i>	Low-Medium	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●	Participation in commute trip reduction programs	3,810
CTO-4	CTO-4.2	Create a TDM program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.	DPW	HR/NOVA CDD	N	Would require a new part time TDM coordinator position within DPW to implement. A study would be required to evaluate measures and costs for the City.	Low-Medium	General Fund	Projects Budget Proposal.					●				
CTO-4	CTO-4.3	Continue to provide density and other zoning incentives or procedural or financial incentives to developments for establishment of alternative transportation infrastructure within the private as well as adjacent public right-of-way, such as increased bicycle parking, separated sidewalks, bike lanes and signage, and change and shower facilities.	CDD	DPW	O	These incentives are already included in CDD codes and policies used for development review. <i>Peery Park Rides Pilot program to commence in 2016 will provide on-demand dynamic shuttle service to serve Peery Park employees.</i>	Low-Medium	Development Enterprise Fund Grants Partner Funding	<i>Peery Park Rides Pilot already funded through grants and partnerships. Seek grants/partnerships for additional actions.</i>	●	●	●	●	●	●	●		
CTO-4	CTO-4.4	Explore programs to encourage large employers to hire Sunnyvale residents.	OCM	None	N	<i>Need to define program.</i>	Low-Medium	Economic Development Budget				●	●	●	●	●		
CTO-5	CTO-5.1	Support the creation of walking school bus programs in coordination with schools and parent organizations.	DPS	LCS	O	Sunnyvale is already partnering with the Santa Clara County Health Department and Sunnyvale School District to promote alternative transportation modes to school. (VERBS Grant)	High	Grant funded General Fund	<i>Existing grant funding to sunset. FY16-17 Budget Issue for Safe Routes to School Coordinator.</i>	●	●	●	●	●	●	●	Commute to school mode share (35% reduction in school commute-related VMT)	1,050

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
CTO-5	CTO-5.2	Encourage schools to link employees and guardians of students with an online system such as 511.org that provides carpool matching.	DPW	LCS	N	Sunnyvale is currently partnering with the Santa Clara County Health Department and Sunnyvale School District to promote alternative transportation modes to school. (VERBS Grant)	High	Grant funded General Fund	Existing grant funding to sunset. FY16-17 Budget Issue for Safe Routes to School Coordinator.	●	●	●	●	●	●	●		
CTO-5	CTO-5.3	Continue to implement a Safe Routes to School program for increased bicycle and pedestrian safety to and from schools.	DPS	None	O	Sunnyvale is currently partnering with the Santa Clara County Health Department and Sunnyvale School District to promote alternative transportation modes to school. (VERBS Grant)	High	State and Federal grants General Fund	Existing grant funding to sunset. FY16-17 Budget Issue for Safe Routes to School Coordinator.	●	●	●	●	●	●	●		
OVT-1	OVT-1.1	Designate preferred parking stalls for electric, hybrid, and other alternative fuel vehicles in all public and private parking lots consistent with the California Green Building Code.	CDD	DPW	O	This is already part of Green Building Code that applies to private development. A new policy would be required for public parking lots.	High	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●	1,500 NEVs in operation 2,660 new electric vehicle charging stations 3% of all vehicles in community are electric vehicles	5990 7970
OVT-1	OVT-1.2	Secure funding to install electric vehicle recharging stations or other alternative fuel vehicle support infrastructure in existing public and private parking lots.	ESD	DPW	I	Participating in regional grant project to install 4 EV charging stations in public areas. Will continue to monitor other grant opportunities.	High	General Fund Grants	Participating in regional two grant projects.	●	●	●	●	●	●	●		
OVT-1	OVT-1.3	Require sufficient electrical service in the garages/parking facilities of new residential development to support electric vehicle charging.	CDD	None	O	Already a requirement	Minimal	Development Enterprise Fund	Already budgeted.	●	●	●	●	●	●	●		
OVT-1	OVT-1.4	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.	DPW	ESD/FIN	O	Fuel efficiency is already a significant factor in selecting new City vehicles; alternative fuels vehicles are higher cost and not typically purchased. Would need to review that purchasing policy.	High	Varies depending on use of vehicles	Additional incremental costs for alternative fuel vehicles not yet budgeted.	●	●	●	●	●	●	●		
OVT-1	OVT-1.5	Collaborate with taxi franchises to use low-emissions vehicles such as hybrids, compressed natural gas vehicles, biodiesel vehicles, or electric vehicles.	DPS	ESD	I	Discussions are underway regarding adding an incentive, such as a reduced vehicle inspection fee for low-emission vehicles, to the FY2016/17 Fee Schedule.	High	General Fund	Absorbed in existing budget resources.				●	●	●	●		
OVT-1	OVT-1.6	Explore zoning or other incentives to encourage alternative fuel stations like biodiesel and compressed or liquefied natural gas in place of or in combination with traditional gasoline and diesel fueling stations.	CDD	ESD	N	Study issue with extensive industry outreach. Implementation cost is private. Study in 2020.	High	Development Enterprise Fund								●		
OVT-1	OVT-1.7	Facilitate new fueling stations that offer alternative fuels.	CDD	ESD	N	Study issue. May have ongoing costs depending on outcome of study issue. Study Issue to be proposed prior to 2020.	High	Development Enterprise Fund								●		
OVT-1	OVT-1.8	Accommodate <del>neighborhood electric vehicles (NEVs)</del> alternatively fueled vehicles by enacting regulations consistent with the California Vehicle Code and the Manual of Uniform Traffic Control Devices.	DPS	DPW	N	Need further examination of which regulations may pertain to NEVs.	High	General Fund Grants	Projects Budget Proposal					●	●	●		
OVT-2	OVT-2.1	Work with car sharing companies such as Zipcar and City Car Share to increase the availability of car-share programs in Sunnyvale	DPW	OCM	N	Sunnyvale already has policies supportive of car sharing services including the use of City maintained parking lots.	Low			●	●	●	●	●	●	●	One car share option in operation	1,270

Measure ID	Activity ID	Activity Description	Lead Dept.	Partner Dept.	Status	Remaining Steps	Cost Range	Funding Source	Funding Status	2014	2015	2016	2017	2018	2019	2020	GHG Metric 2020	2020 GHG Reduction MTCO <sub>2</sub> e
OVT-2	OVT-2.2	Identify appropriate locations, and require facilities for car share vehicles in new parking garages, job, centers, commercial cores, neighborhoods, and transit hubs.	CDD	DPW, OCM	O	The Sunnyvale Caltrain Station would be an appropriate location with adjacent City maintained parking lots that could accommodate a car share program. <i>City is including car share facilities in Specific Plans (e.g., Lawrence Station Area Plan).</i>	Low			●	●	●	●	●	●	●		
OVT-3	OVT-3.1	Increase signal coordination as warranted to facilitate traffic flow along arterials and major collectors.	DPW	None	O	This is an ongoing effort as funds permit.	High	General Fund	Already budgeted.	●	●	●	●	●	●	●	40% Reduction in vehicle idling times	3,000
OVT-3	OVT-3.2	Deploy intelligent transportation systems measures for managing traffic of large-scale construction projects and at major City and private events.	DPW	DPS	I	<i>The City successfully pilot tested the deployment of an Advanced Traffic Management System in 2015. Traffic signal optimization and coordination on four corridors in Sunnyvale is under study. The first contract award in February 2016.</i>	High	General Fund	Partially budgeted.	●	●	●	●	●	●	●		
A-1	A-1.1	Appoint a staff liaison to attend and participate in regional meetings focusing on adaptation and resilience and to report back to staff on a regular basis.	ESD	CDD, OCM	I	Need to determine appropriate staff to participation and set up mechanism for reporting out for City specific actions and follow-ups.	Minimal	General Fund Grant Fund	Absorbed in existing budget resources.	●	●	●	●	●	●	●		
A-2	A-2.1	Regularly train and inform the Department of Public Safety Office of Emergency Services (OES) on potential climate change risks and hazards.	DPS	None	I	Present CAP to DPS and discuss opportunities for integrating climate adaption and resiliency into emergency preparedness plans and materials.	Low	General Fund Grant Fund	Absorbed in existing budget resources.		●							
A-2	A-2.2	Update the City Emergency Plan and Emergency Preparedness Workbook to address climate change impacts.	DPS	None	I	Determine schedule for next update of Plan.	Low	General Fund Grant Fund	Projects Budget Proposal.		●							
A-3	A-3.1	Analyze and disclose possible impacts of climate change on the project or plan area with an emphasis on sea level rise.	CDD	None	O	Requires analysis and adoption of climate change data specifically to Sunnyvale and creation of adoption of adaptation assumptions. Continue participation in Silicon Valley 2.0 Project. Submitted application to Rockefeller 100 Resilient Cities Challenge that would fund Chief Resiliency Officer to develop resiliency plan.	Unknown	Regional Program Grant General Fund	Continue regional participation. Pursue grants.	●	●	●	●	●	●	●		
A-3	A-3.2	Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.	ESD	CDD	O	Create Adaptation Plan or adopt adaptation assumptions. Consult CAP and Adaptation Plan when updating codes. See A-3.1	Unknown	Regional Program Development Enterprise Fund	Continue regional participation. Pursue grants.				●	●				
A-4	A-4.1	Dedicate a page of the City’s website to climate change and climate change adaptation.	ESD	OCM	N	Create Climate Change Web Page. Fully interactive webpage following citywide webpage redesign project.	Low	General Fund Grant Fund	<i>Initially funded through 2-yr Projects Budget for CAP program implementation. On-going funds to be identified.</i>			●	●	●	●	●		
A-4	A-4.2	On a regular basis, assess adaptation efforts of the City, region, and state and identify goals or gaps to be addressed.	ESD	CDD	I	Prepare Information RTC. Incorporate Study Issue scope, potentially report out with bi-annual update	Unknown Potentially Very High	General Fund Grant Fund	Continue regional participation. Pursue grants.			●		●		●		