



City of Sunnyvale

Notice and Agenda

Sustainability Commission

Monday, April 21, 2014

7:00 PM

West Conference Room, City Hall, 456 W.
Olive Ave., Sunnyvale, CA 94086

CALL TO ORDER

SALUTE TO THE FLAG

ROLL CALL

PUBLIC ANNOUNCEMENTS

Speakers are limited to 3 minutes for announcements of related commission events, programs, resignations, recognitions, acknowledgments.

CONSENT CALENDAR

- 1 **14-0461** Draft Minutes of the Sustainability Commission Meeting of March 17, 2014.

PUBLIC COMMENTS

This category is limited to 15 minutes, with a maximum of three minutes per speaker. If you wish to address the commission, please complete a speaker card and give it to the Recording Secretary or you may orally make a request to speak. If your subject is not on the agenda, you will be recognized at this time; but the Brown Act (Open Meeting Law) does not allow action by commission members. If you wish to speak to a subject listed on the agenda, you will be recognized at the time the item is being considered by the commission.

PUBLIC HEARINGS/GENERAL BUSINESS

- 2 [14-0453](#) Climate Action Plan to Achieve State Recommended Greenhouse Gas Emissions Reduction Goals in Assembly Bill 32: California Global Warming Solutions Act of 2006
Environmental Review: Negative Declaration

Recommendation: Recommend that Council take the following actions:

Alternative 1 (and 3 Planning Commission Only):

- Approve the Negative Declaration;
- Adopt the Climate Action Plan with Implementation Program;
- Direct staff to move forward with "just do it" CAP Action Items;
- Direct staff to prepare a CAP CEQA checklist to determine future project consistency with the CAP for all departments to use for public and private projects;
- Direct staff to come back to Council within four months with a timeline, work plan and possible funding strategies for CAP GHG emission reduction measures; and
- Direct staff to come back within four months with a recommendation for securing a CAP monitoring program with a proposed budget modification as needed.

3 **14-0463** Selection of a Sustainability Commission Chair

NON-AGENDA ITEMS & COMMENTS

-Commissioner Comments

-Staff Comments

INFORMATION ONLY REPORTS/ITEMS

4 **14-0460** Sunnyvale Letter of Opposition to AB 2145- Electricity: Community Choice Aggregation

ADJOURNMENT

Notice to the Public:

Any agenda related writings or documents distributed to members of this meeting body regarding any item on this agenda will be made available for public inspection in the Environmental Services Department located at 1444 Borregas Avenue, Sunnyvale or can be accessed through the Office of the City Clerk located at 603 All America Way, Sunnyvale during normal business hours and in the meeting location on the evening of the Sustainability Commission meeting, pursuant to Government Code §54957.5.

Agenda information is available by contacting Dustin Clark at (408) 730-7713. Agendas and associated reports are also available on the City's web site at

<http://sunnyvale.ca.gov> or at the Sunnyvale Public Library, 665 W. Olive Ave., Sunnyvale, 72 hours before the meeting.

Pursuant to the Americans with Disabilities Act, if you need special assistance in this meeting, please contact Dustin Clark at (408) 730-7713. Notification of 48 hours prior to the meeting will enable the City to make reasonable arrangements to ensure accessibility to this meeting. (29 CFR 35.106 ADA Title II)



City of Sunnyvale

Meeting Minutes - Draft

Sustainability Commission

Monday, March 17, 2014

7:00 PM West Conference Room, City Hall, 456 W. Olive Ave.,
Sunnyvale, CA 94086

CALL TO ORDER

The meeting was called to order at 7:05 p.m. by Vice Chair Srivastava.

SALUTE TO THE FLAG

ROLL CALL

Present: 5 - Commissioner Gerald Glaser
Commissioner Dan Hafeman
Commissioner Petya Kisyova
Commissioner Bruce Paton
Vice Chair Amit Srivastava
Absent: 1 - Commissioner Barbara Fukumoto

Commissioner Fukumoto (absence excused)
Council Liaison: Mayor Jim Griffith (present)

PRESENTATION

1 PRESENTATION - Water Conservation

Water and Sewer Division Manager Mansour Nasser provided a presentation to the Commission regarding the current status of California's water supply situation, Sunnyvale's supply sources, water conservation programs and potential actions that may be brought forward in response to the drought.

PUBLIC ANNOUNCEMENTS

Vice Chair Srivastava opened the public hearing to public comments.

There were no comments.

Vice Chair Srivastava closed the public hearing.

CONSENT CALENDAR

2 Draft Minutes of the Sustainability Commission Meeting of January 21, 2014.

Commissioner Kisyova moved and Commissioner Hafeman seconded the motion to approve the consent calendar. The motion carried.

Yes: 4 - Commissioner Hafeman
Commissioner Kisyova
Commissioner Paton
Vice Chair Srivastava

No: 0

Absent: 1 - Commissioner Fukumoto

Abstain: 1 - Commissioner Glaser

PUBLIC COMMENTS

Vice Chair Srivastava opened the public hearing to public comments.

There were no comments.

Vice Chair Srivastava closed the public hearing.

PUBLIC HEARINGS/GENERAL BUSINESS

3 Discussion: Updating the Green Building Program

Commissioner Glaser moved and Commissioner Hafeman seconded the motion to recommend Council adopt Green Building Standards no less rigorous than those presented by staff and that staff consider including requirements for PV readiness for residential and commercial new construction. The motion carried by unanimous vote.

Yes: 5 - Commissioner Glaser
Commissioner Hafeman
Commissioner Kisyova
Commissioner Paton
Vice Chair Srivastava

No: 0

Absent: 1 - Commissioner Fukumoto

4 Discussion and Possible Action: Nomination of Sustainability Commission Representative to the Lawrence Station Area Plan (LSAP) Citizens Advisory Group (CAG)

Commissioner Glaser moved and Commissioner Kisyova seconded the motion to nominate Commissioner Fukumoto as the Sustainability Commission representative to the Lawrence Station Area Plan Citizen Advisory Group ,if willing, and if not to take up the issue at the next meeting. The motion carried by unanimous vote.

Yes: 5 - Commissioner Glaser
Commissioner Hafeman
Commissioner Kisyova
Commissioner Paton
Vice Chair Srivastava

No: 0

Absent: 1 - Commissioner Fukumoto

5 Discussion and Possible Action: Approval of Sustainability Commission Annual Workplan

Commissioner Glaser moved and Commissioner Paton seconded the motion to approve the Sustainability Commission Annual Workplan as modified. The motion carried by a unanimous vote.

Yes: 5 - Commissioner Glaser
Commissioner Hafeman
Commissioner Kisyova
Commissioner Paton
Vice Chair Srivastava

No: 0

Absent: 1 - Commissioner Fukumoto

6 Discussion and Possible Action: Draft Climate Action Plan

The Sustainability Commission reviewed and discussed the Draft Climate Action Plan (CAP) in preparation for the staff report and public hearing at their April meeting. The Commission discussed a letter sent to them by the Silicon Valley Association of Realtors (SVAR) regarding the SVARs request that the Commission consider recommending Council remove a CAP provision requiring mandatory water and energy efficiency disclosure at the time of sale of a home.

The Commission commented on the lack of substantiated data provided by the realtors association of the impact from the measure and would welcome additional information and specific data, such as impacts to transactions times, etc.

7 Discussion and Possible Action: Selection of Commission Chair and Vice Chair

The Sustainability Commission deferred this item until the April meeting.

COMMISSIONER ORAL COMMENTS

Commissioner Hafeman commented that every other light bulb has been removed from the streetlights downtown near the new Solstice development. Commissioner Hafeman is interested in hearing from staff regarding how that occurred and whether it was done as a result of a complaint from Solstice or if a light survey had been conducted and determined it was appropriate to make the change.

Commissioner Paton reported attending some training sessions provided by the Elkhorn Slough Coastal Training Program regarding climate communication and climate engagement. Commissioner Paton also reported attending a program called Reimagining Our Future, that talked about visualizing a more positive future.

Commissioner Hafeman reported attending a meeting regarding the Lawrence Expressway road modification plan.

ADJOURNMENT

Vice Chair Srivastava adjourned the meeting at 10:00 p.m.

CITY OF SUNNYVALE

The Heart of Silicon Valleysm

456 WEST OLIVE AVENUE SUNNYVALE, CALIFORNIA 94086 (408) 730-7480

Jim Griffith
Mayor

April 14, 2014

Jim Davis
Vice Mayor

The Honorable Steven Bradford
Chair, Assembly Utilities and Commerce Committee
State Capitol
P.O. Box 942849
Sacramento, CA 94249-0062

David Whittum
Councilmember

Pat Meyering
Councilmember

**RE: Assembly Bill 2145 (Bradford) - Electricity: Community Choice
Aggregation - OPPOSE**

Tara Martin-Milius
Councilmember

Dear Assembly Member Bradford:

Glenn Hendricks
Councilmember

Gustav Larsson
Councilmember

I am writing on behalf of the City of Sunnyvale to express opposition to AB 2145 (Electricity: Community Choice Aggregation). The proposed legislation limits community choice, runs contrary to the original intent of AB 117 by changing the fundamental Community Choice Aggregation (CCA) participation mechanism, and undermines California's environmental goals. CCAs are successfully meeting local community needs under existing provisions established by AB 117; the changes proposed by AB 2145 are not needed.

Current City of Sunnyvale policies place a high priority on environmental management, sustainability, and renewable energy. For example, City Council Policy 3.5.1 Energy specifies supporting efforts to provide affordable, reliable, diverse, safe, and environmentally acceptable power to the citizens and businesses of Sunnyvale. Sunnyvale is currently striving to reduce greenhouse gas emissions as part of the state's AB 32 legislation. We believe AB 2145 will negatively impact our City's ability to accomplish our emission reduction goals and limit the renewable energy options available to our residents and businesses.

AB 2145 Limits Community Choice

Most residential customers in California, the majority of those who could be served by a community choice aggregator, do not have the opportunity to choose an alternate utility provider. This bill limits the

options of communities that have chosen or would like to create a local, public, not-for-profit alternative that offers customers greater choice in choosing clean energy.

AB 2145 Runs Contrary to the Original Intent of AB 117

AB 117, which authorized Community Choice Aggregation in California, intentionally structured CCAs as an "opt-out" program. The goal of AB 117 was to level the playing field for CCAs that wanted to enter a monopoly market, so there could be alternative choices for customers. Today, monopoly investor owned utilities (IOUs) dominate the industry, leaving no or little choice for other market entrants with motivations other than profit. AB 2145 serves the interests of for-profit IOUs by locking the market in favor of the existing utilities.

AB 2145 Undermines California's Environmental Goals

A CCA "opt-in" program, as proposed by AB 2145, would not generate the large increase in renewable energy purchases and greenhouse gas (GHG) emission reductions that occur as part of implementing CCAs. For example, Marin Clean Energy (MCE) provides more than twice as much renewable energy as PG&E, and MCE's most recently published GHG emissions rate is 19% lower than PG&E. In addition, Sonoma Clean Power is offering a 100% local renewable energy source to its customers. Defaulting customers to an IOU provider with a higher GHG emissions rate runs counter to AB 32's goals and undermines California's climate change prevention initiatives, many of which are spearheaded by local governments.

AB 2145 is Not Needed

Under existing law, customers can easily make a choice when a CCA begins offering service in a new community. There is a four-month public noticing process with the requirement of at least four opt-out notices sent to every customer. In addition, customers can easily opt out during or after the public noticing process. There is no such opt-out option available to IOU customers.

For these reasons, we urge you oppose AB 2145 (Bradford) and support community choice. Thank you for your consideration of our position. Please do not hesitate to contact me or John Stuffelbean, Director of Environmental Services, at (408) 730-7954 if you have any questions.

Sincerely,



Jim Griffith
Mayor

cc: City Council
Robert Walker, Interim City Manager
John Stuffelbean, Director of Environmental Services
Assembly Utilities and Commerce Committee
Martha Guzman, Deputy Legislative Secretary, Governor's Office



City of Sunnyvale

Agenda Item

14-0453

Agenda Date: 4/21/2014

REPORT TO THE BICYCLE AND PEDESTRIAN ADVISORY COMMISSION, SUSTAINABILITY COMMISSION, AND PLANNING COMMISSION

SUBJECT

Climate Action Plan to Achieve State Recommended Greenhouse Gas Emissions Reduction Goals in Assembly Bill 32: California Global Warming Solutions Act of 2006
Environmental Review: Negative Declaration

REPORT IN BRIEF

The Climate Action Plan (CAP) is a Greenhouse Gas (GHG) emissions reduction plan to address the causes of climate change and reduce the impacts of climate change in the future. It was developed as a response to the State of California's legislative directive (AB 32) for cities to develop local plans to reduce GHG emissions.

Adoption of the CAP does not include a commitment of funds at this time, such as a Capital Improvement Plan. It is a policy document, similar to a Strategic Plan that provides a roadmap to advance the City's target of achieving a minimum 15% reduction in GHG emissions. The CAP outlines broad goals with reduction measures and specific action items to reach this target. If the CAP is adopted, further studies and Council action would be required to implement items that involve new programs, regulations or budget allocations.

The CAP document provides a helpful and detailed Executive Summary as well as extensive chapters on the purpose of the CAP, background on the legislative context, GHG science, a GHG inventory (background data for Sunnyvale GHG conditions), a GHG reduction strategy and an implementation plan. Technical appendices are also attached. The CAP is attached (Attachment 1: Draft Climate Action Plan) and is also available online at *Horizon2035.InSunnyvale.com*.

In addition to a GHG emissions reduction strategy, the CAP also contains recommended steps to monitor and participate in regional climate adaptation efforts in order to be prepared for the physical changes (e.g., sea level rise) and climate changes (e.g., increased fires, drought and flooding) that are predicted to occur even with GHG reduction efforts moving forward.

The proposed CAP builds upon the City's current and past environmental efforts. It is an assertive program that advances the City's long-term commitment and leadership role in the area of sustainability. The CAP takes existing City programs, codes and policies and combines them with new GHG emission reduction measures to create a timeframe for implementation and monitoring that would result in Sunnyvale exceeding the recommended GHG reduction goals outlined by the State.

Adhering to the CAP will not only meet State recommended reduction levels (15 percent below 2008 levels by 2020), but will exceed them. The CAP was developed to advance Sunnyvale's leadership

position in the area of sustainability. Adopting the CAP will also allow the City to take advantage of streamlining provisions under the California Environmental Quality Act (CEQA).

Ideally the City will implement the entire plan in order to make the most significant contribution to a climate change solution. Like most plans the CAP is not set in stone. Because of regular required monitoring and updating of the GHG emissions inventory, the CAP is expected to be evaluated and adjusted periodically.

Although the CAP program is a long-term commitment, there is considerable work to be completed in the next 1-5 years. Staff time and funds will be needed to accomplish the CAP goals. As a result, the CAP has been subjected to a multi-department review and will require a strong commitment by City leaders and management because it affects all departments.

The CAP will be considered by the City Council at a hearing on May 20, 2014. Staff recommends adoption of the CAP.

BACKGROUND

Climate Change

The purpose of reducing GHG emissions is to address climate change. Greenhouse gases (carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)) naturally create a blanket around the earth that allows in light but traps in heat to make the planet livable. This "Greenhouse Effect" occurs in natural levels, but is accelerated by human activity that increases the emissions level of GHG. This causes unexpected warming with potentially negative impacts to the climate system.

Global Impacts of Climate Change include:

- Increased tropical cyclone intensity
- Loss of seasonal frozen ground
- Increased drought intensity
- Hotter/dryer conditions

According to the California Air Resources Board and other sources documented in the CAP, California is the 15th largest GHG emitter worldwide. Two percent of Global GHG emissions originate in California. Depending on GHG emissions levels and warming range, the following changes and impacts can be expected without action taken to reduce GHG emissions, 2070-2099:

- \$ Billions in economic losses
- 22-30 inches sea level rise (loss of property and infrastructure)
- 3-4 x increase in heat wave days
- 2.5 x increase in critically dry years (contributes to crop losses)
- 70-80% loss in snowpack (contributes to drought)
- 2-6 x increase in heat related deaths
- 55% increase in large wildfire risks
- 7-14% decrease in forest yields

Horizon 2035 Citizen Advisory Committee

To assist staff in preparation of the Land Use and Transportation Element (LUTE) and CAP, Council

appointed Horizon 2035, a 15-member citizen advisory committee charged with providing feedback and input to staff on policies and implementation measures for both the LUTE and CAP. Horizon 2035 met 26 times during an 18-month period and also held additional sub-committee meetings to review and develop the LUTE and CAP. The result of the committee's efforts is a robust GHG reduction program that focuses the City's sustainability efforts moving forward. The CAP goes beyond "feel good" efforts and provides quantifiable goals and strategies for GHG emissions reduction.

Meeting notes and materials from the Horizon 2035 meetings as well as other information about the LUTE/CAP development process, and the draft CAP document can be found on the project web page at *Horizon2035.InSunnyvale.com*. All Horizon 2035 meetings were open to the public and there were several regular attendees.

EXISTING POLICY

Sunnyvale's Commitment to Sustainability

The CAP Introduction chapter provides a detailed discussion of Sunnyvale's long-term commitment to sustainability and the climate protection efforts that City has adopted or participated in to date. Starting with the 2007 Sunnyvale Community Vision which calls for the City to be a regional leader in environmental sustainability, the City has also adopted or participated in the following (as well as additional efforts):

- Sunnyvale's adopted Framework for Environmental Sustainability (2007)
- Sunnyvale's Green Building Program
- Partner in Sustainable Silicon Valley
- Adoption U.S. Mayors Climate Protection Agreement
- 2007 Municipal Climate Action Plan (for City facilities and service)
- Water Efficient Landscape Ordinance
- Creation of the Sunnyvale Sustainability Commission.

Additional Sunnyvale Climate Protection Efforts:

- U.S. Conference of Mayors' Climate Protection Agreement
- International Council for Local Environmental Initiatives (ICLEI) former member
- 2007 Municipal Climate Action Plan (addresses only internal City practices)
- Bicycle Friendly Community - Bronze Level
- Tree City USA - 22 consecutive years

ENVIRONMENTAL REVIEW

A Negative Declaration has been prepared in compliance with the California Environmental Quality Act (CEQA) provisions and City Guidelines (Attachment 2 - Negative Declaration and Initial Study). The Initial Study has determined that the proposed project would not have a significant effect on the environment and no mitigation is required.

DISCUSSION

Purpose of the CAP

California and Bay Area Legislative Framework

In addition to advancing Sunnyvale's long time commitment to the environment and sustainability, the CAP has been prepared to address and comply with the state and regional legislative framework for GHG emissions reductions. The CAP Introduction, Chapter 1, explains in detail the state and regional legislative framework that has been established for reducing GHG including the following:

Governor's Executive Order S-3-05

- This order outlines progressive GHG emissions reduction targets.
 - By 2010, reduce GHG emissions to 2000 levels.
 - By 2020, reduce GHG emissions to 1990 levels.
 - By 2050, reduce GHG emissions to 80% below 1990 levels.

AB 32 - California Global Warming Solution Act of 2006

- Landmark legislation to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.
- Identifies local governments as strategic partners to achieve state goals.
- Translates the goal to a 15% reduction of current citywide emissions by 2020.

SB 375 - Sustainable Communities & Climate Protection Act of 2008

- Aims to reduce GHG emissions by linking transportation funding to land-use planning.
- Requires metropolitan planning organizations (MPOs) to create Sustainable Communities Strategies (SCSs) and coordinate preparation of regional transportation plans (RTPs) with Regional Housing Needs Assessments (RHNA) primarily to reduce urban sprawl and meet regional projected housing needs.
- Sunnyvale participated in the SCS adopted by ABAG in 2013 as part of Plan Bay Area. The SCS demonstrates how the region will achieve the state GHG reduction targets for 2020 and 2035.
- Five Priority Development Areas (PDAs) were adopted in Sunnyvale just prior to and as part of the SCS. These areas will be eligible for regional transportation funds/grants.

SB 97 - CEQA Guidelines Amendments of 2007

- CEQA Guidelines were amended to address GHG emissions for conducting environmental review on projects.
- Local governments may use adopted CAPs consistent with the CEQA Guidelines to assess cumulative impacts of project on climate change for projects that are not exempt from CEQA.
- Sunnyvale's CAP has been prepared to qualify for using the streamlining provisions of the CEQA Guidelines; on-going monitoring is required.

Bay Area Air Quality Management District (BAAQMD) Guidelines

- BAAQMD developed CEQA Air Quality Guidelines to assist lead agencies in evaluating air quality impacts for projects in the San Francisco Bay Air Basin including GHG emissions impacts related to climate change.
- Sunnyvale's CAP meets the BAAQMD criteria to be considered a Qualified GHG Reduction Strategy. Sunnyvale projects can be determined to have less than significant impacts when conducting CEQA analyses as long as the project or plans are in compliance with the CAP.

CAP Justifications

While there is not a direct mandate to cities and counties to prepare and implement a CAP, that could change since environmental regulations on climate change continue to evolve. The following are current justifications supporting adoption of a CAP:

1. Environmental leadership;
2. Local control (versus top down directives from the state or regional agencies that will likely increase if emissions are not reduced);
3. Tailored and locally appropriate solutions (that usually result in more efficient use of resources and cost savings over time);
4. Greater certainty and consistency in how GHGs will be addressed in future development;
5. Consistency with AB 32;
6. Economic development and diversity (particularly when energy efficiency or renewable energy or similar programs create new jobs/job training);
7. Competitiveness and access to grant programs;
8. Increased community education and involvement; and
9. Communities with adopted CAPs and GHG reduction programs in progress may have greater opportunity to access cap and trade funds set aside for local reductions.

Relationship to Sunnyvale Land Use and Transportation Planning

There are numerous CAP strategies that are related to land use and transportation in Sunnyvale. The CAP began as an adjunct to preparation of the update to the Land Use and Transportation Element of the General Plan (LUTE). In 2010 when the efforts for the LUTE were beginning, then State Attorney General Jerry Brown challenged a number of cities and counties on their general plan updates because their plans did not adequately address the impacts of climate change in quantifiable terms. At that time Sunnyvale determined that a Climate Action Plan would be necessary in order to adopt a new LUTE. The City secured a \$100,000 Energy Efficiency and Conservation Block Grant as part of the 2009 American Reinvestment and Recovery Act and hired Pacific Municipal Consultants (PMC) to help develop the CAP.

The intent was that the land use and transportation policies in the updated LUTE would be developed to support the GHG reduction goals of the CAP and the two documents would move through the approval process together. At this time, the LUTE project is delayed while the Environmental Impact Report (EIR) transportation analysis is completed and coordinated with other significant land use plans underway in the City such as the Lawrence Station Area Plan and the Peery Park Specific Plan.

Recently, staff determined that the City would benefit from separating the CAP from the LUTE adoption process and proceeding separately with the CAP. The City has been missing out on opportunities to start the GHG emissions reduction process and was lagging behind in meeting the intended goals of the plan. There are also CEQA process streamlining allowances the City can utilize with an adopted qualified GHG reduction plan as determined by the Bay Area Air Quality Management District (BAAQMD). The City could be eligible for energy-saving and transportation planning grant opportunities if the CAP is adopted.

CAP and the Current General Plan

At this time there are no further actions needed to coordinate the General Plan and the CAP. When

amendments are considered to the General Plan and when the General Plan is updated, the City will need to make sure they are consistent in order to promote the benefits of the CAP. The on-going update to the Land Use and Transportation Chapter of the General Plan (LUTE) has been coordinated with the CAP and was prepared in conjunction with the Horizon 2035 committee.

Relationship to Other Departments and Programs

The CAP GHG Reduction Measures and Action Items will require an integrated effort that will involve most City departments. Chapter 5, Implementation Program, provides a matrix indicating for each measure the quantified GHG emissions reduction, generalized costs and savings to the City and the community, a timeframe for its implementation and the most likely responsible department or division. Later in this report is a preliminary cost analysis that was developed with contributions from multiple City departments.

Moving forward, all City departments will be aware of the CAP and incorporate its principles into their planning, operations, and budgets. Where future programs, projects or regulations (private and public) will have an effect on GHG emissions and/or the CAP goals and measures, the effect will be evaluated and documented for monitoring purposes.

Moving forward, the CAP goals and measures will be considered when prioritizing annual study issues, considering changes to codes or new operational policies and when determining where to focus public education and outreach funds. The City's priorities for intergovernmental coordination and regional planning efforts will also be influenced by the CAP.

CAP PROGRAM

CAP Planning Process

A baseline emissions inventory and forecast are the basis of the CAP analysis (CAP Chapter 2).

GHG Inventory

2008 is the baseline year that was quantified. The inventory starts with collecting activity data for seven sectors. Sunnyvale emitted approximately 1,270,170 metric tons of carbon dioxide equivalents in baseline year 2008. The following indicates Sunnyvale baseline GHG Emissions by sector.

- 16% - Residential energy
- 39% - Commercial and industrial energy
- 35% - On-road transportation
- 6% - Community waste
- 1% - Water
- 3% - Off-road equipment and vehicles
- <1% - Caltrain transit

Figure 7 and Table 8 in CAP Chapter 2 illustrate this data and provide metric tons of carbon dioxide equivalents for each sector.

GHG Emissions Forecast

The GHG emissions forecast is an estimate of how emissions will grow based on the City's household, jobs, and population growth projections. To estimate the GHG reductions that will be needed to reach the AB 32 target, Sunnyvale's emissions were forecasted using currently adopted General Plan projected growth. Two scenarios were developed - a Business-As-Usual (BAU)

forecast and an Adjusted Business-As-Usual (ABAU) forecast that incorporates the GHG emissions reduction effects from existing state and regional programs. CAP Chapter 2 provides a number of figures and tables that quantify and demonstrate the forecasts for years 2010, 2020, and 2035.

These forecasts represent a “No-CAP” situation. For year 2020 Sunnyvale emissions in the ABAU forecast rise 2 percent to 1,289,920 metric tons of carbon dioxide equivalents from baseline. By 2035 the growth is 8 percent and 1,369,510 metric tons of carbon dioxide equivalents. Figure 9 in CAP Chapter 2 shows the relationship and reductions realized between the BAU and ABAU forecasts for 2008 through 2035.

While the ABAU represents for Sunnyvale a significant reduction over the BAU scenario, the state goal is not met. AB 32 recommends that local governments adopt a GHG reduction target of 15 percent below present (2005-2008) levels, by 2020. Furthermore, former Governor Schwarzenegger signed Executive Order S 3-05 in 2005 establishing a statewide goal of achieving an 80 percent reduction below 1990 GHG emissions levels by 2050.

After state and regional efforts are factored into Sunnyvale’s growth forecast, the City’s challenge to meet the GHG reduction targets will be fulfilled by implementing a substantial portion of the Climate Action Plan. Figure 10 in CAP Chapter 2 superimposes the BAU and ABAU forecasts with the targets.

GHG Reduction Measures & Quantification

The CAP identifies GHG reduction strategies to reduce emissions by a minimum of 241,550 metric tons of carbon dioxide equivalents (approximately 17 percent) to reach the GHG reduction target by 2020.

The CAP GHG emissions reduction measures have been analyzed and quantified by an outside consulting firm that specializes in GHG reduction plans in order to verify that the program outlined in the CAP will quickly move Sunnyvale towards the state-recommended 15 percent reduction goals to reach 1990 GHG levels by 2020 as well as the longer term goal of reducing GHG levels an additional 80 percent below 1990 levels for 2050.

Emissions reductions were quantified for three years: 2010, 2020, and 2035. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has made in implementing measures within the CAP, while 2020 and 2035 missions reductions are the potential reductions that will be achieved through implementation of the CAP measures from now to the two horizon years. Appendix B, GHG Technical Appendix, provides information on how the GHG Emissions Reduction Measures were quantified.

The reduction measures in the CAP are a mix of regulatory and incentive-based programs. The reduction measures aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total (existing actions, state programs, and implementation of the most assertive GHG reduction measures), the CAP will reduce GHG emissions in the City of Sunnyvale by 2020 by 438,050 metric tons of carbon dioxide equivalents, more than double the required GHG reductions necessary to meet AB 32 targets (CAP Appendix C, BAAQMD Compliance).

One of the most beneficial recommended reduction measures included in the CAP is EP-1 which

directs the City of Sunnyvale to create or join a community choice aggregation (CCA) program to increase the renewable energy portfolio of electricity delivered to Sunnyvale to consist of more than 50 percent renewable sources by 2035. The Council has prioritized a 2014 study issue to analyze the costs and benefits of a CCA. Funding for this Study Issue will be presented for Council consideration as a Budget Supplement in the City Manager's Recommended Budget for FY 14-15. CAP Appendix C provides a comparison of the CAP program with and without a CCA. Without a CCA the City will still meet the AB 32 2020 targets with implementation of all other measures.

For 2020, the following table shows the percent GHG reduction achieved with each CAP goal from the total reduction. 100 percent represents the total reduction of 438,050 metric tons of carbon dioxide equivalents achieved by the CAP (with CCA). A similar table and figure are provided in Chapter 3 of the CAP. The following table depicts the goals in the order of magnitude of the GHG emissions reduction achieved to illustrate the benefits of each goal or strategy.

Sunnyvale CAP 2020 GHG Reduction Summary - % Benefit by Goal (w/CCA)

Goal	% Total CAP GHG Reductions
Provide a Sustainable Energy Portfolio, including CCA (EP)	58%
Decrease Energy Consumption (EC)	16%
Reduce Landfilled Waste (LW)	12%
Improve Mobility Through Land Use Planning (LUP)	5%
Expand Sustainable Circulation and Transportation Options (CTO)	4%
Optimize Vehicular Travel (OVT)	3%
Off-Road Equipment (OR)	2%
Decrease Water Consumption (WC)	1%
Open Space and Urban Forestry (OS)	1%

With the creation or participation in a CCA, the above goals would result in a 2020 GHG emissions reduction of 438,050 metric tons of carbon dioxide equivalents which is a 30 percent reduction from the 2008 baseline of 1,270,170 metric tons.

CAP Implementation

After approval of the CAP, the next step is following the Implementation Plan which outlines the short and long-term measures and actions for the City to adopt in order to meet the State's reduction goals. The CAP will also allow the City to take advantage of streamlining provisions under CEQA and BAAQMD as a Qualified Greenhouse Reduction Strategy. It can also serve as an economic development tool and provide a method for measuring the City's progress in meeting sustainability goals.

The CAP contains 10 Goals, 36 GHG Emissions Reduction Measures and 130 supporting Action Items that have been proposed by staff and the Horizon 2035 Citizen Advisory Committee. It also includes an additional four Implementation Measures with related Action Items to assure monitoring and success of the CAP.

The CAP is an ambitious program that includes a number of measures that are already in place in Sunnyvale as well as new programs that will require significant commitment by the City. Chapter 3 of the CAP discusses GHG Emissions Reduction Strategies and provides the GHG reductions expected for each Reduction Measure. Chapter 5, the Implementation Program, provides a fold out matrix indicating for each measure the quantified GHG emissions reduction, generalized costs and savings to the City and the community, a timeframe for its implementation and the most likely responsible department or division.

CAP Monitoring

The CAP includes Action Items that address monitoring as well as periodically updating the GHG inventory. Monitoring requires the City to utilize methods to quantify and track the GHG reduction goals that are quantified in the CAP. Establishing a monitoring program will be one of the first implementation steps if the CAP is adopted. Regular monitoring will be required in order to be accountable for CEQA streamlining and to take advantage of potential grant funding for GHG emission reduction activities. Staff will also return to Council with a recommendation to purchase a monitoring program.

For example, the City may be able to take credit for potential future measures adopted at the regional and state level allowing the City to reduce the number of tasks necessary to meet state goals. Or, if a CAP goal or measure becomes infeasible, the City can adopt alternative measures that might be more cost effective or realistic as long as the overall effectiveness of the CAP is maintained.

If the CAP is adopted, staff would come back to Council within four months with a recommended work program to move forward with the most effective CAP tasks as well as many easily implementable CAP tasks. Staff will also outline priorities and a timeline for tackling the “big ticket” tasks over the CAP timeframe. Staff would also develop administrative tools such as a CAP/CEQA compliance checklist to use for all new projects in Sunnyvale that are not exempt from CEQA.

CAP Survey

A *Horizon2035.InSunnyvale.com* web site survey asked about the Draft CAP and the Draft Land Use and Transportation Chapter of the General Plan. The survey ran from May 2013 to March 2014 (22 months) and was initiated when the Draft CAP and LUTE were made available for public comment in 2012. The survey included 11 questions related to the CAP. 143 people participated in the survey with duplicate efforts taken by approximately eight people. Staff has analyzed the results. The survey results for the CAP are attached (Attachment 3: CAP Survey Results). All comments provided by survey takers have been included.

FISCAL IMPACT

The CAP will have significant costs associated with its implementation. The program is an assertive, long-term effort with many measures and actions that are slated to be implemented in the near-term (by 2015) and over the mid (2020) and long-term (post 2020) time frames in the implementation plan. Funding the CAP will require commitment and use of a number of funding sources.

The CAP Cost Analysis (Attachment 4) provides a general cost estimate for implementing the Action Items in the CAP. The overall fiscal impact of the CAP cannot be clearly defined at this point as the long-term cost will depend on variables such as: future Council policy and budget direction; the City's aggressiveness in pursuing the GHG Measures; the specific Action Items implemented; the future

availability of grants and other funding sources; the adoption of new fees and charges; advances in technology and associated cost efficiencies; and changes in state and regional regulations. Additionally, some costs might be borne by businesses, residents and future developments rather than the City. The CAP Cost Analysis highlights the “big ticket” Action Items (\$100,000 to over \$1,000,000 each), with the majority of other items grouped into several lower cost categories; most of the items in the lower cost categories range from \$5,000 to \$50,000 each.

Likely funding sources include:

1. Continuation of funding for existing City programs;
2. Funding of new City programs from reserves, new fees or reappropriation from other programs;
3. Private development funded actions through City regulations; and

Many of the recommended GHG Emissions Reduction Measures are continuations of plans or programs the City already has in place. Some will require additional funding. The costs indicated in Attachment 4 are those needed beyond what is already committed in the 20-year budget.

For example, the City’s bicycle and pedestrian improvement plans are currently funded at approximately \$9.5M. To fully fund the plans, as called for in the CAP, an additional \$10M is required plus an increased allocation to cover on-going maintenance costs. Another example is acquiring more energy efficient vehicles for the City which is estimated to cost approximately \$100K a year over the current budget for vehicle replacement.

For other Action Items, such as installing electric vehicle charging stations throughout the City, these may be accomplished through private development or grants. Other Action Items will require that the City make additional changes to its Green Building Code, more fully implement and monitor State codes, make changes to the way the City reviews and monitors new construction, and undertake additional public education and outreach. It is expected that the City will be eligible for more grant funding opportunities once the CAP is adopted.

Should Council adopt the CAP, staff would move forward with or continue to implement the “just do it” items involving minor code changes, practices, and intergovernmental coordination (Attachment 5: Just Do It List). The cost of implementing these Action Items is minimal. Staff will also return to Council within four months of adoption with a timeline and work plan for accomplishing the near-term CAP GHG Emission Reduction Measures, and a possible timeline for tackling the higher cost tasks over the CAP timeframe.

Chapter 5, the Implementation Program, includes additional measures associated with the commitment to fund, monitor and update the CAP. Regarding funding, the CAP states;

Implementation Measure 4: Funding Sources

Secure necessary funding to implement the Climate Action Plan.

Action Items:

- 4.1. Identify potential funding sources for reduction measures as part of annual reporting.
- 4.2. Ensure implementation through the inclusion of emissions reduction and adaptation measures in department budgets, the capital improvement program, and other plans as appropriate.

- 4.3. Pursue local, state and federal grants to assist with potential costs to the City and community and support successful implementation of the CAP.

PUBLIC CONTACT

- Notice of the Planning Commission and City Council hearings was published in the *Sun* newspaper and posted with the Agendas on the official notice bulletin board.
- Notice of the Bicycle and Pedestrian Advisory Commission and the Sustainability Commission was posted with the Agendas on the official notice bulletin board.
- Posted on the City's Web site.

In addition to the Horizon 2035 meetings, there were a number of other public meetings and outreach programs conducted for the CAP:

- CAP interactive public outreach facilitated by PMC (June 30, 2010);
- Cities for All Ages presented by Don Weden (July 22, 2010);
- CAP public outreach facilitated by PMC (September 29, 2010);
- LUTE/CAP Update, Joint Study Session with CC, PC, BPAC (October 26, 2010)
- LUTE/CAP Community Workshops
 - Raynor Park (March 1, 2012)
 - Community Center (March 8, 2012)
 - Fair Oaks Park (March 15, 2012);
- Silicon Valley Association of Realtors (April 2012);
- Sunnyvale Democratic Club by invitation (March 15, 2014);
- Library information table (April 12 and 26, 2014); and
- Additional Community Outreach (May 2014).

ALTERNATIVES

1. The *Bicycle and Pedestrian Advisory Commission*, the *Sustainability Commission*, and the *Planning Commission* recommend that Council take the following actions:
 - Adopt the Climate Action Plan with Implementation Program;
 - Direct staff to move forward with the "just do it" CAP Action Items;
 - Direct staff to prepare a CAP CEQA checklist to determine future project consistency with the CAP for all departments to use for public and private projects;
 - Direct staff to come back to Council within four months with a timeline, work plan and possible funding strategies for CAP GHG emission reduction measures; and
 - Direct staff to come back within four months with a recommendation for securing a CAP monitoring program with a proposed budget modification as needed.
2. Do not approve the CAP and provide further direction to staff on next steps.

For Planning Commission consideration only:

3. Recommend that Council Approve the Negative Declaration.
4. Recommend that Council not approve the Negative Declaration and direct staff to complete additional environmental analysis.

STAFF RECOMMENDATION

Recommend that Council take the following actions:

Alternative 1 (and 3 Planning Commission Only):

- Approve the Negative Declaration;
- Adopt the Climate Action Plan with Implementation Program;
- Direct staff to move forward with “just do it” CAP Action Items;
- Direct staff to prepare a CAP CEQA checklist to determine future project consistency with the CAP for all departments to use for public and private projects;
- Direct staff to come back to Council within four months with a timeline, work plan and possible funding strategies for CAP GHG emission reduction measures; and
- Direct staff to come back within four months with a recommendation for securing a CAP monitoring program with a proposed budget modification as needed.

Staff recommends approval of the CAP. The CAP provides a programmatic approach to addressing the recommended state goals for GHG emissions reductions. The CAP also strengthens the City’s commitment to environmental sustainability and provides community benefits beyond GHG emissions reductions. The City will need a CAP to take advantage of streamlined CEQA processes and to be more competitive for grant funding.

Prepared by: Gerri Caruso, Principal Planner

Reviewed by: Trudi Ryan, Planning Officer

Reviewed by: Hanson Hom, Director, Community Development

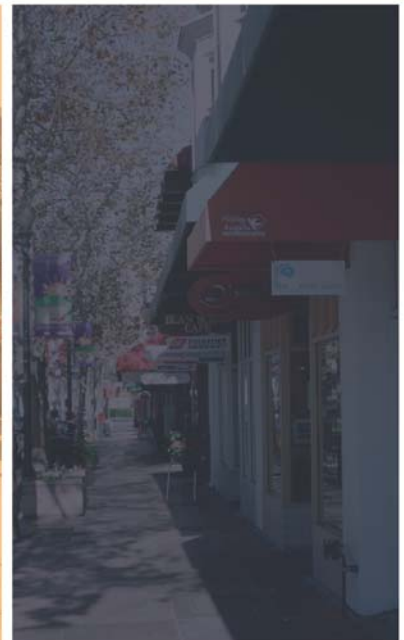
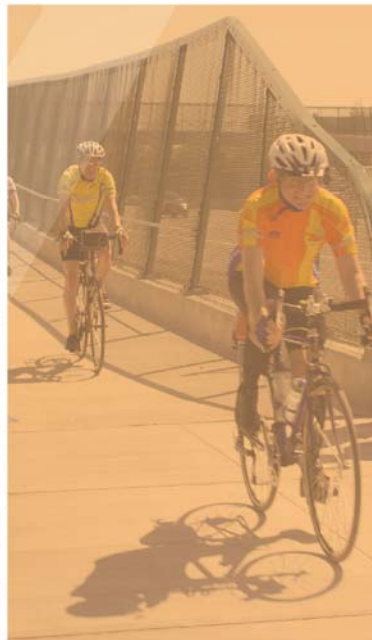
Approved by: Robert A. Walker, Interim City Manager

ATTACHMENTS

1. Draft Climate Action Plan
2. Negative Declaration and Initial Study
3. CAP Survey Results
4. CAP Cost Analysis
5. “Just Do It” Action Items

CITY OF SUNNYVALE

Climate Action Plan



CITY OF SUNNYVALE

DRAFT CLIMATE ACTION PLAN

April 2014

Prepared for:



City of Sunnyvale
Community Development Department

Prepared by:



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ACKNOWLEDGEMENTS

U. S. Department of Energy

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EXECUTIVE SUMMARY

This Climate Action Plan is Sunnyvale's path toward creating a more sustainable, healthy, and livable Sunnyvale. The strategies outlined in this Plan will not only reduce GHG emissions but will also provide energy, fuel, water, and monetary savings while improving the quality of life in Sunnyvale. This Climate Action Plan is intended to streamline future environmental review of development projects in Sunnyvale by following the California Environmental Quality Act (CEQA) Guidelines for a Qualified GHG Reduction Strategy.

EXECUTIVE SUMMARY

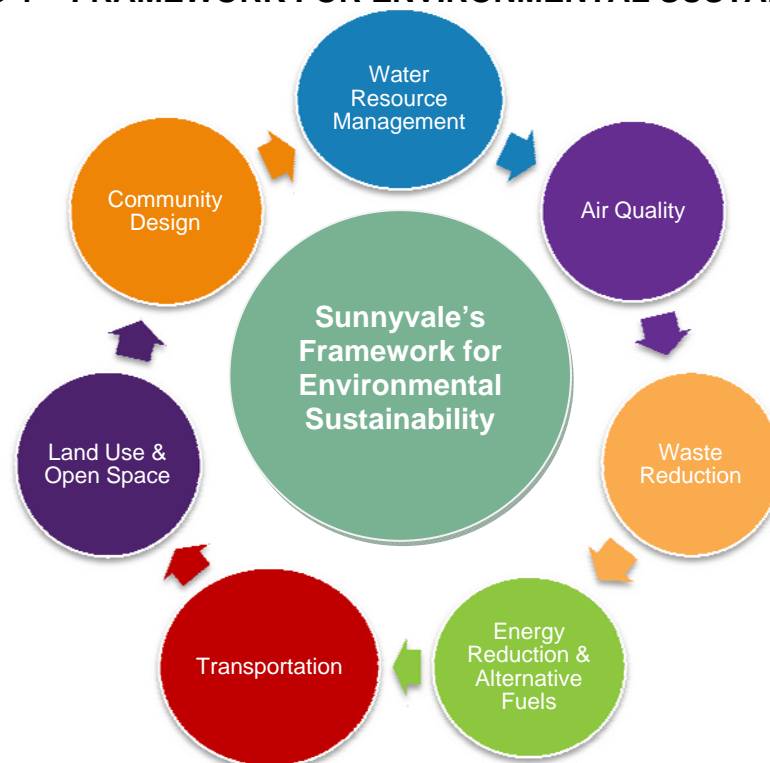
This Climate Action Plan (CAP; Plan) is Sunnyvale's path toward creating a more sustainable, healthy, and livable Sunnyvale. The strategies outlined in this Plan will not only reduce GHG emissions but will also provide energy, fuel, water, and monetary savings while improving the quality of life in Sunnyvale.

This Climate Action Plan is intended to streamline future environmental review of development projects in Sunnyvale by following the California Environmental Quality Act (CEQA) Guidelines and meeting the Bay Area Air Quality Management District's (BAAQMD) expectations for a Qualified GHG Reduction Strategy. The CAP will also identify how the City will achieve the state-recommended GHG emission reduction target of 15% below 2008 levels by the year 2020 (equivalent to 1990 emissions). The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. The City has a long-standing commitment to implementing environmental programs and proactively working to reduce GHG emissions. The adoption and implementation of this Plan will reinforce and build upon these policies and programs.

Framework for Environmental Sustainability

In 2007, the City developed a framework for environmental sustainability to guide the implementation of policies and programs related to air quality, community design, energy reduction, land use, transportation, waste reduction, and water resource management. **Figure ES-1** below defines the organizational structure of the City's framework.

FIGURE ES-1 – FRAMEWORK FOR ENVIRONMENTAL SUSTAINABILITY



Planning Process

The development process for this Plan relied on a comprehensive public participation strategy to engage residents, business owners, and stakeholders in the identification and refinement of goals, programs, activities, and projects to reduce emissions. The public participation process included significant involvement from the Horizon 2035 Advisory Committee, City-sponsored community workshops, stakeholder focus group meetings, development of a project website, and interagency coordination.

The project website provides access to all workshop and meeting notices and materials, links to resources, and a forum to submit comments and questions to staff. In addition, the City created a Facebook account to provide status updates on the Plan and alerts for workshops.

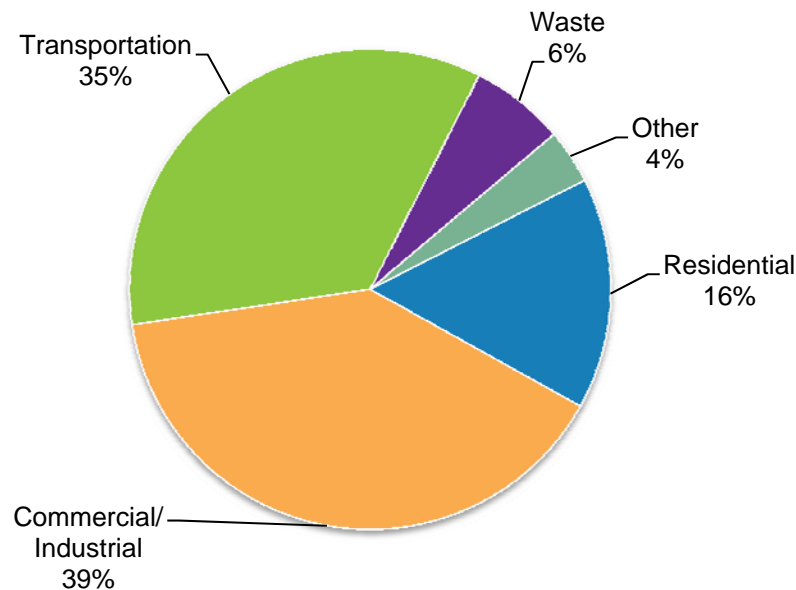
GHG Emissions Inventory

The first component of a Qualified GHG Reduction Strategy is to conduct an inventory of GHG emissions within a specified geographic boundary. The City of Sunnyvale's GHG inventory utilizes a baseline year of 2008 to inventory carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) generated from activities by the Sunnyvale community.

The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use and direct process emissions related to water and wastewater, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in Sunnyvale. In 2008, the community emitted approximately 1,270,170 metric tons of carbon dioxide equivalents (MTCO₂e) (see **Table ES-1** and **Figure ES-2**).

TABLE ES-1 – 2008 COMMUNITY-WIDE BASELINE EMISSIONS BY SECTOR

2008 Baseline Greenhouse Gas Emissions	MTCO ₂ e	Percentage of Total
Residential	198,140	16%
Commercial/Industrial	502,210	39%
Transportation	442,610	35%
Community Waste	76,970	6%
Landfill Gas	3,600	<1%
Water	6,870	1%
Off-Road	37,830	3%
Caltrain	1,940	<1%
Total	1,270,170	100%

FIGURE ES-2 – 2008 BASELINE GHG EMISSIONS BY SECTOR

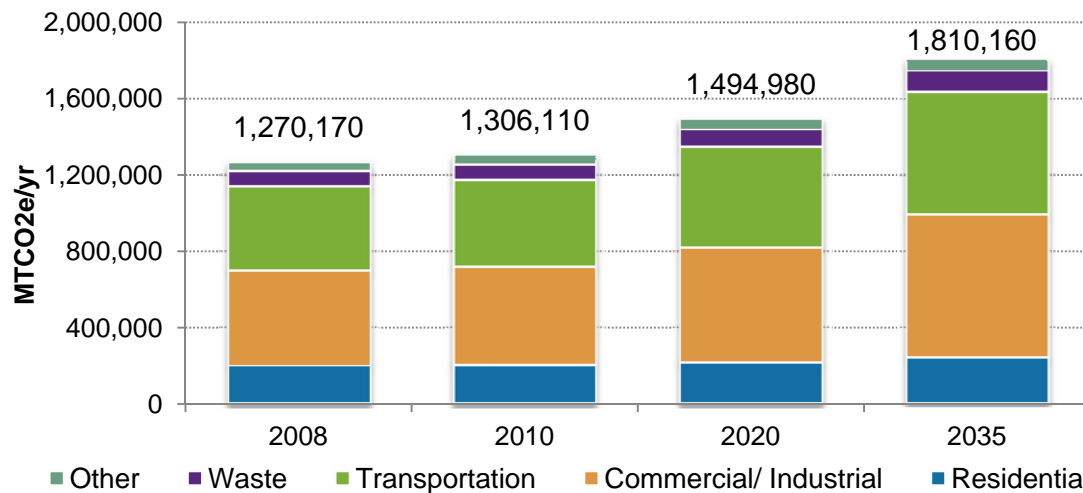
GHG EMISSIONS PROJECTIONS

The basis for all growth scenarios is a business-as-usual (BAU) projection. The BAU projection forecasts emissions to reflect the City's growth projections without regulatory or technical intervention to reduce GHG emissions. The BAU projection is based on population, housing, employment, and vehicle miles traveled projections for 2020 and 2035, as shown in **Table ES-2**. The population, housing, and employment forecasts come from the City's General Plan, most recently updated in 2011.

TABLE ES-2 – SUNNYVALE COMMUNITY GROWTH INDICATORS

	2008	2010	2020	2035	2008 – 2035 Percentage Change
Population	133,110	135,100	145,020	159,910	20%
Households	54,130	55,050	59,660	66,570	23%
Jobs	73,630	76,320	89,750	109,900	49%
Service Population	206,740	211,420	234,770	269,810	31%

These indicators are then applied to the 2008 GHG emissions inventory to determine a BAU growth scenario. Under the BAU scenario, community-wide emissions will grow by approximately 18% by the year 2020 to 1,494,980 MTCO₂e and by 43% by 2035 to 1,810,160 MTCO₂e, as shown in **Figure ES-3**.

FIGURE ES-3 – BUSINESS-AS-USUAL GHG FORECAST, 2008–2035*

* Other sources include water, wastewater, landfill gas, and off-road making less than 5% of the inventory.

In addition to AB 32, California has adopted and initiated implementation of several state-level programs that will impact local GHG emissions. In order to effectively determine the local emissions reductions that will need to be implemented to meet the City's emissions reduction target, the impact of state-level programs has been incorporated into an adjusted business-as-usual forecast. The state-level programs included in this adjusted forecast include the Renewable Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of the Clean Car Fuel Standard, commonly referred to as the Pavley Standard. The impact of these state programs (shown in **Table ES-3**) will play a critical role in helping Sunnyvale to achieve the emissions reduction target.

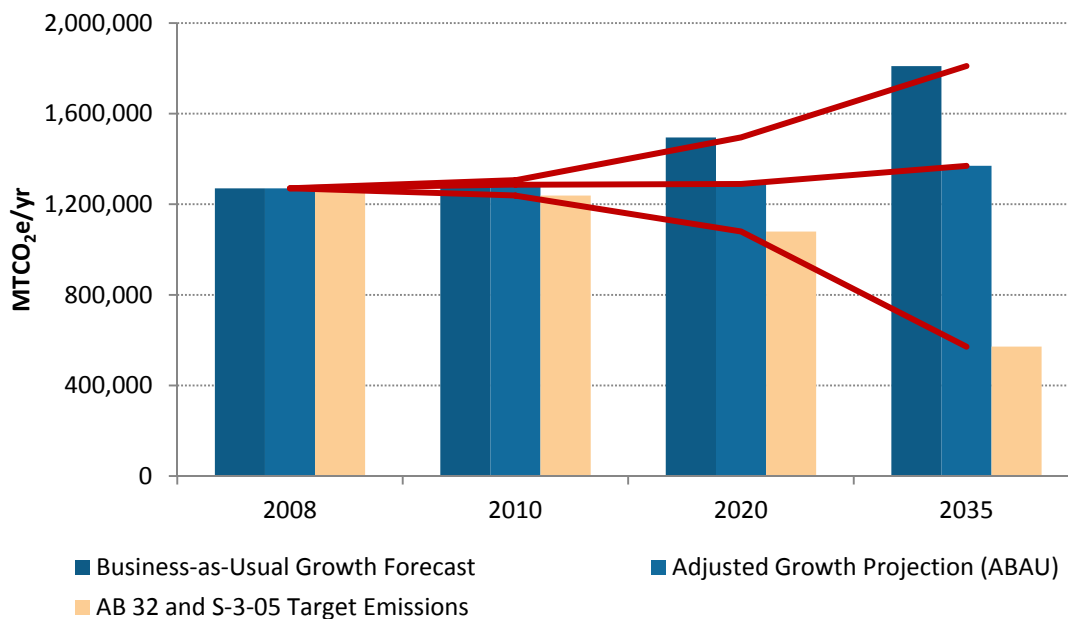
TABLE ES-3 – STATE REDUCTIONS SUMMARY

	2008	2010	2020	2035
BAU Forecast	1,270,170	1,306,110	1,494,980	1,810,160
BAU Forecast Growth Percentage		3%	18%	43%
Pavley I – Clean Car Fuel Standard	–	0	-81,150	-159,460
Renewable Portfolio Standard	–	-19,700	-90,800	-173,690
CALGreen & 2008 Title 24 Standards	–	0	-31,210	-105,400
Caltrain Electrification	–	0	-1,900	-2,100
Total State/Regional Reductions	–	-19,700	-205,060	-440,650
Adjusted BAU Forecast	1,270,170	1,286,410	1,289,920	1,369,510
ABAU Forecast Growth Percentage	0%	1%	2%	8%

GHG EMISSIONS REDUCTION TARGET

After state and regional efforts are factored into Sunnyvale's growth forecast, the City's challenge to meet the GHG reduction targets of 15% below baseline levels by 2020 and progress toward the 80% below 1990 levels by 2050 will be fulfilled by the Climate Action Plan. **Figure ES-4** below identifies the gap between the City's GHG emissions forecast and the reduction targets if policies and programs are not developed to reduce GHG emissions.

FIGURE ES-4 – GHG FORECASTS AND STATE REDUCTION TARGETS



GHG REDUCTION MEASURES

It is important to identify how the City will meet or exceed the minimum GHG reduction target of 15% below baseline levels by 2020 to ensure the City can utilize the Climate Action Plan as a Qualified GHG Reduction Strategy for use in environmental review of projects. This Plan identifies a clear path to allow the City to exceed the community-wide GHG reduction target of 15% below baseline levels by 2020.

The GHG reduction measures included in this Climate Action Plan demonstrate the City's ability to reach and exceed the GHG reduction target of 15% below baseline levels by 2020. Emissions reductions were quantified for three different years: 2010, 2020, and 2035. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has already made in implementing measures within the CAP. The 2020 and 2035 emissions reductions are the potential reductions that will be achieved through the implementation of these measures over the next several years.

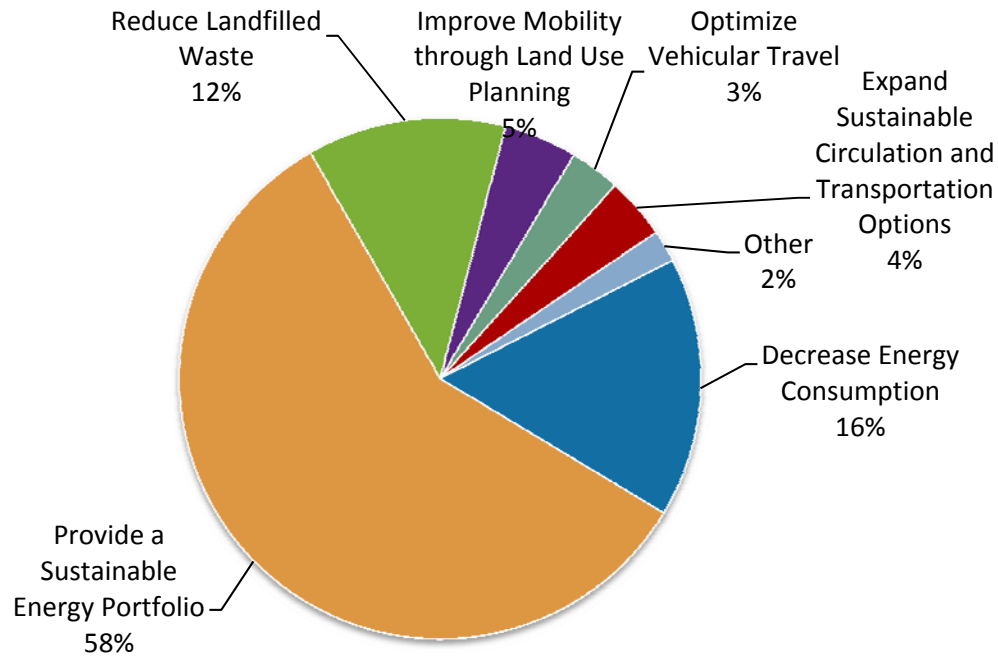
The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs. The reduction measures aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, existing actions, state programs, and GHG reduction measures in this Plan will reduce GHG emissions in the City of Sunnyvale in 2020 by 438,050 MTCO₂e (see **Table ES-4**), more than double the required GHG reductions necessary to meet AB 32 targets. **Figure ES-5** identifies the GHG reductions to be achieved by 2020 by goal.

The GHG reduction strategies are separated by goal or topic area to correspond with the sectors and sources of GHG emissions as follows:

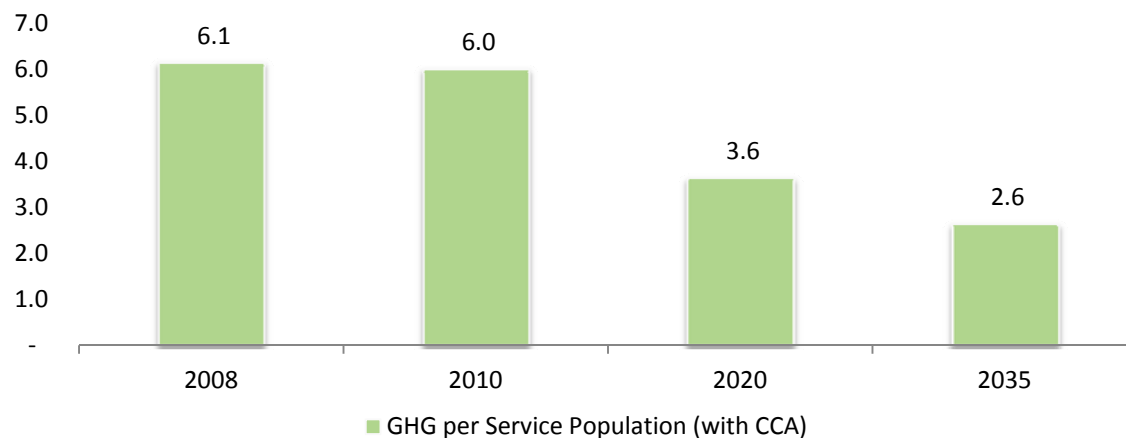


TABLE ES-4 – GHG REDUCTION SUMMARY BY TOPIC

Sector	2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Open Space and Urban Forestry	-310	-780
Decrease Energy Consumption	-70,680	-104,610
Provide a Sustainable Energy Portfolio	-254,380	-363,090
Decrease Water Consumption	-980	-1,520
Reduce Landfilled Waste	-53,960	-96,190
Reduce Off-Road Equipment Emissions	-7,430	-13,820
Increase and Retain Awareness of Sustainability Issues	0	0
Improve Mobility through Land Use Planning	-19,880	-21,410
Expand Sustainable Circulation and Transportation Options	-16,660	-32,380
Optimize Vehicular Travel	-13,770	-26,110
Total Reductions	-438,050	-659,910

FIGURE ES-5 – 2020 EMISSIONS REDUCTIONS BY GOAL (MTCO₂E)

Implementation of the CAP by 2020 will exceed state recommendations and BAAQMD threshold requirements for developing a Qualified GHG Reduction Strategy by approximately 15%. As shown in **Figure ES-6**, through the implementation of this Plan, the City's GHG emissions will decrease from 6.1 MTCO₂e per person per year in 2008 to 2.6 MTCO₂e per person per year in 2035.

FIGURE ES-6 – GHG EMISSIONS PER SERVICE POPULATION (MTCO₂E)

ADAPTATION

Even with significant efforts to mitigate GHG emissions today, future climate projections anticipate that climate change may have significant effects on California's and Sunnyvale's precipitation, temperature, and weather patterns. Sunnyvale is located in Santa Clara County in close proximity to the San Francisco Bay. The potential consequences of climate change for the State of California and the City of Sunnyvale include those described below. The anticipated effects climate change may have on the Northern California region include:

- Increased wildfire risk;
- Negative impacts to wildlife;
- Deteriorating public health;
- Decreased supply of fresh water;
- Increased sea level rise.

To ensure climate change adaptation is adequately incorporated into future planning efforts, preliminary measures have been provided to guide City staff involvement in coordinating, preparing for, and educating the public on the potential impacts that climate change may have on the community.

IMPLEMENTATION

To ensure the success of this Climate Action Plan, the City will integrate the goals and strategies of this Plan into other local and regional plans, programs, and activities. As the City moves forward with the Land Use and Transportation Element update as well as Zoning Code updates, Specific Plans, Housing Element updates, and other documents, staff will make sure that these documents support and are consistent with the CAP.

CAP implementation will also require City leadership to execute strategies and report on the progress of implementation. The City's sustainability coordinator will be responsible for coordinating GHG reduction efforts between departments and will designate staff to monitor and report on the progress of the CAP. This Plan identifies the responsible department for each measure and offers time frames and plan-level cost estimates for implementing each strategy. Lastly, successful implementation requires regular monitoring and reporting. Staff should monitor the CAP's implementation progress on an annual basis and report to the City Council on the Plan's progress each year.

ENVIRONMENTAL REVIEW

To comply with the California Environmental Quality Act, the CEQA Guidelines recommend that the CAP undergo environmental review and demonstrate that it will have a less than significant environmental impact for all impacts analyzed. An Initial Study and Negative Declaration have been prepared to analyze the potential environmental effects of the CAP.

CHAPTER 1



INTRODUCTION

Local governments play an essential role in reducing greenhouse gas emissions and mitigating the potential impacts of climate change. This Climate Action Plan is Sunnyvale's path toward creating a more sustainable, healthy, and livable Sunnyvale. The strategies outlined in this Climate Action Plan will not only reduce GHG emissions but will also provide energy, fuel, water, and monetary savings while improving the quality of life in Sunnyvale.

INTRODUCTION

Local governments play an essential role in reducing greenhouse gas (GHG) emissions and mitigating the potential impacts of climate change. This Climate Action Plan (CAP; Plan) is Sunnyvale's path toward creating a more sustainable, healthy, and livable Sunnyvale. The strategies outlined in this Plan will not only reduce GHG emissions but will also provide energy, fuel, water, and monetary savings while improving the quality of life in Sunnyvale. This Plan recognizes the necessity to act and demonstrates the City's commitment to reducing GHG emissions. The CAP is broken into the following chapters:

- An introduction to the regulatory and scientific framework under which this Plan was created (Introduction – **Chapter 1**);
- 2008 greenhouse gas emissions inventory and 2020 and 2035 forecasts (Greenhouse Gas Inventory & Forecast – **Chapter 2**);
- Sunnyvale's strategy to reduce greenhouse gas emissions (GHG Emissions Reduction Strategies – **Chapter 3**);
- Opportunities to adapt to climate change (Adaptation – **Chapter 4**); and
- The path necessary to successfully implement this CAP (Implementation Program – **Chapter 5**).

To streamline the main document, multiple technical appendices have been prepared to provide additional detail and information regarding GHG reductions, costs, and sources. This Plan includes the following four appendices:

- Technical memo on GHG emissions inventory results and methodologies (Baseline GHG Inventory – **Appendix A**);
- Summary of methodology and assumptions for GHG quantification and costs (GHG Methodology – **Appendix B**);
- Detailed discussion of how this Plan will satisfy BAAQMD requirements for a Qualified GHG Reduction Strategy (BAAQMD Compliance – **Appendix C**); and
- A list of all referenced materials included within this document (Works Cited – **Appendix D**).

Purpose and Scope

This Climate Action Plan is intended to streamline future environmental review of development projects in Sunnyvale by following the California Environmental Quality Act (CEQA) Guidelines and meeting the Bay Area Air Quality Management District's (BAAQMD) expectations for a Qualified GHG Reduction Strategy. The CAP will also identify how the City will achieve the state-recommended GHG emission reduction target of 15% below 2008 levels by the year 2020. The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. The City of Sunnyvale has a long-standing commitment to implementing environmental programs and proactively working to reduce GHG emissions. The adoption and implementation of this Plan will reinforce and build upon these policies and programs.

Local Context

Sunnyvale is located in the heart of the Silicon Valley in the San Francisco Bay Area. Sunnyvale is the 7th largest city in the nine-county Bay Area in terms of population and jobs. Sunnyvale started as a small fruit orchard farming community that expanded to include canneries with the extension of the railroad to the community in 1864. The city's industrial base began with the relocation of Hendy Iron Works from San Francisco in 1906 following the San Francisco earthquake. Sunnyvale was incorporated as a city in 1912, with a population of 1,800. Between 1930 and 1950, the development of Moffett Naval Air Station and World War II brought several aeronautical and defense-related industries to Sunnyvale including Westinghouse (now known as Northrop Grumman) and Lockheed Martin, which continue to be among Sunnyvale's largest employers. The city relies on information services and manufacturing industries, as shown in **Table 1**, as the economic and employment drivers of the community. Today, Sunnyvale is home to some of the nation's most successful research, manufacturing, and development businesses including NetApp, Yahoo, Advanced Micro Devices, Lockheed Martin, Nokia, and Juniper Networks.

TABLE 1 – SUNNYVALE 2005 EMPLOYMENT BY INDUSTRY

Employment by Industry	Percentage
Information Services	25
Manufacturing	24
Misc./Undefined	13.2
Retail Trade	10
Services	8.2
Recreation/Hospitality	3.5
Construction	2.2
Public Administration	1
Wholesale Trade	.9

*Note: Figures based on December 2005 Employment Development Data
(www.labormarketinfo.edd.ca.gov)*

Since the 1960s, the city has grown to over 140,000 residents and prides itself on high-quality city services including a unified public safety department, prize-winning parks, and significant promotion of cultural arts and activities in the community.

The Council Policy Manual (CPM) is a collection of policies established by the City Council through resolution or motion to guide City action and achieve General Plan goals. Policies included in the CPM align with the City's General Plan elements and provide direction in the areas of land use and transportation, community development, environmental management, public safety, socioeconomics, cultural, and planning and management.

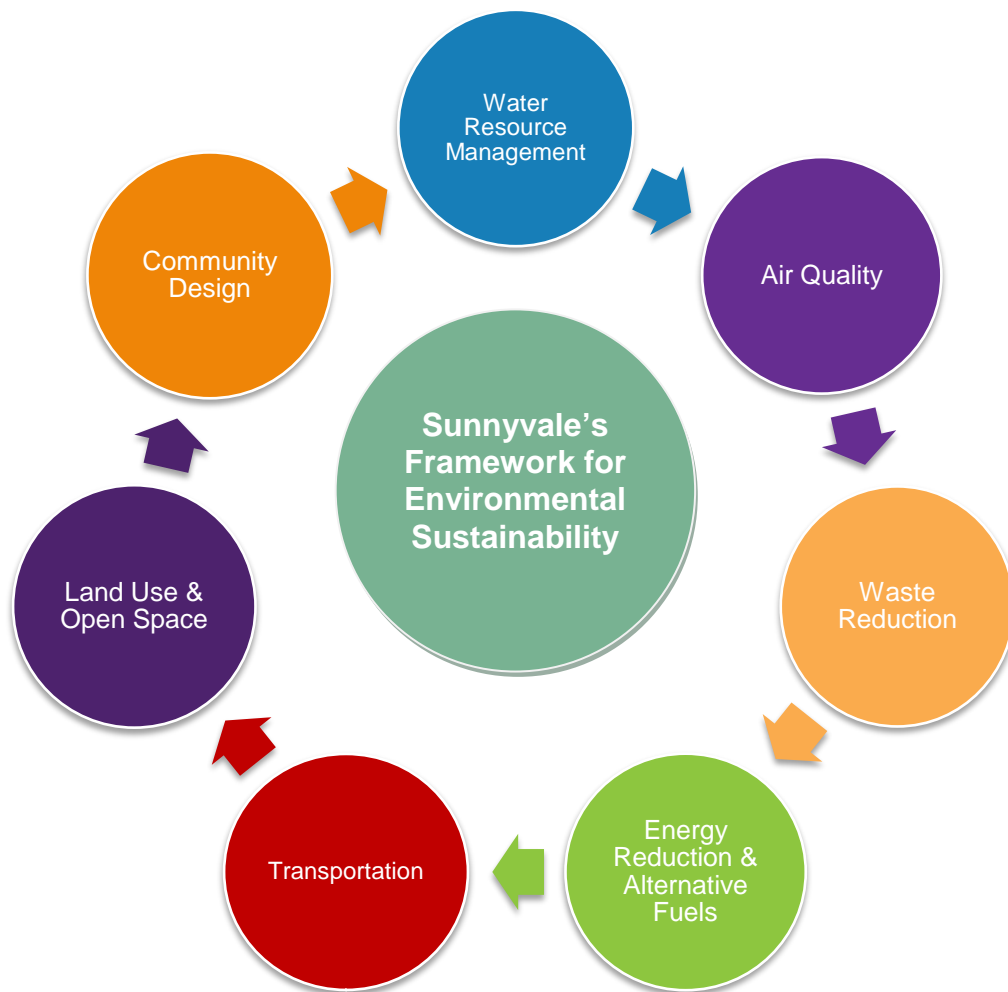
Local Climate Protection Efforts to Date

Although climate change is a global issue, the City of Sunnyvale recognizes that many strategies at the local level can help prevent its progression. The City has a long history of integrating and implementing sustainability practices through public-private partnerships, General Plan implementation, and effective community engagement.

Framework for Environmental Sustainability

In 2007, the City developed a framework for environmental sustainability to guide the implementation of policies and programs related to air quality, community design, energy reduction, land use, transportation, waste reduction, and water resource management. **Figure 1** below defines the organizational structure of the City's framework.

FIGURE 1 – SUNNYVALE'S FRAMEWORK FOR ENVIRONMENTAL SUSTAINABILITY



Sunnyvale's Green Building Program

In 2010, the City Council adopted a Green Building Program to build energy-efficient buildings that conserve natural resources and improve indoor air quality based on the CALGreen minimum requirements and Build It Green's GreenPoint Rated program. The Green Building Program includes incentives, determined by the City Council, for buildings that exceed minimum green building standards.

Sustainable Silicon Valley

The City is also a partner in Sustainable Silicon Valley, a collaborative effort among local government, regional agency, and private sector stakeholders. Sustainable Silicon Valley was created in 2000 by the California Environmental Protection Agency, Santa Clara Valley Water District (SCVWD), Silicon Valley Leadership Group (SVLG), and Silicon Valley Environmental Partnership (SVEP) to conserve resources and improve the environment in the Silicon Valley through comprehensive environmental management with a focus on the following six environmental pressures:

- 1) Use of energy from nonrenewable sources measured by CO₂ emissions
- 2) Use of fresh water
- 3) Urban sprawl
- 4) Habitat development and fragmentation
- 5) Use of nonrenewable raw materials
- 6) Discharges of toxic chemicals to the air

Energy Efficiency and Conservation Block Grant Projects

The 2009 American Reinvestment and Recovery Act (ARRA) package has supported state and local government investment in greenhouse gas reduction activities through Energy Efficiency and Conservation Block Grant (EECBG) funding. The EECBG program, managed under the US Department of Energy, has provided a total of \$3.2 billion to cities, counties, states, and private entities across the United States. The goals of the EECBG program are to make strategic investments to meet the nation's long-term goals for energy independence and leadership in climate change by reducing fossil fuel emissions; reducing the total energy use of eligible entities; improving energy efficiency in transportation, building, and other appropriate sectors; and creating and retaining jobs.



In September 2009, the DOE awarded the City \$1.2 million in EECBG funds to develop a program that would demonstrate reductions in greenhouse gases, improve energy efficiency and stimulate job growth. The City's projects funded through the EECBG program include a streetlight retrofit project, this Climate Action Plan, and Acterra's Green@Home energy audit program.

Additional Existing Climate Protection Efforts

Sunnyvale is also participating in or coordinating several other programs and activities that will directly or indirectly reduce GHG emissions and further the community's sustainability goals. The following is a brief list of additional City efforts to reduce GHG emissions:

- U.S. Mayor's Climate Protection Agreement
- ICLEI Member
- 2007 Municipal Climate Action Plan
- Bicycle Friendly Community – Bronze Level
- Tree City USA – 22 consecutive years



Sunnyvale has been designated as a bicycle-friendly community by the League of American Bicyclists.

Relationship of the CAP to the General Plan

The Climate Action Plan incorporates the City's existing efforts and activities to reduce GHG emissions and builds upon components of the General Plan that, when implemented, will reduce GHG emissions from energy use, transportation, water use, waste disposal, and other activities.

The CAP will include chapters for energy use and renewable energy policies, waste reduction policies, and water conservation policies, in addition to transportation and land use policies, and will also include a quantitative analysis of the GHG reduction benefit of each policy to serve as a Qualified GHG Reduction Strategy in accordance with the CEQA Guidelines and BAAQMD guidance.

Planning Process

The development process for this Plan relied on a comprehensive public participation strategy to engage residents, business owners, and stakeholders in the identification and refinement of goals, programs, activities, and projects to reduce emissions. The public participation process included significant involvement from the Horizon 2035 Advisory Committee, City-sponsored community workshops, stakeholder focus group meetings, development of a project website, and interagency coordination.

The project website provides access to all workshop and meeting notices and materials, links to resources, and a forum to submit comments and questions to staff. In addition, the City created a Facebook account to provide plan updates and alerts for workshops.

Sustainability Commission

The Sustainability Commission is a seven-member advisory body to the City Council charged with providing expertise on environmental and sustainability policy issues related to the City's General Plan and this Climate Action Plan. The commission's advisory capacity to the City Council includes the following specific duties:

- Advise Council on policy issues addressing sustainability goals.
- Advise Council on how to strategically accelerate Sunnyvale's progress toward sustainability and recommend priorities in order to promote continued regional leadership in sustainability.
- Periodically review policies governing specific practices, such as greenhouse gas (GHG) emissions reduction, water conservation, renewable energy, energy efficiency, waste reduction, and urban forestry. Illustrative examples include creation of infrastructure for low emission vehicles, habitat restoration and conservation, biodiversity preservation, and reduction of toxics in the waste stream.
- Advise Council on ways to drive community awareness, education, and participation in best practices.
- Review and make recommendations to Council on federal, state, and regional policies related to sustainability which impact the Council's goals and policies.

Horizon 2035 Advisory Committee



A subcommittee of the City Council created the Horizon 2035 Advisory Committee to serve in an advisory capacity during the development of the Land Use and Transportation Element update and Climate Action Plan. The committee will also assist with community outreach and education during LUTE and CAP

development and implementation. The committee meets on a monthly basis and is made up of 15 members representing a broad cross-section of the Sunnyvale community.

The vision, goals, policies, and actions in this CAP have been developed in collaboration with the Horizon 2035 committee, and the committee has assisted staff in prioritizing the implementation of CAP measures.

CLIMATE CHANGE SCIENCE

In order to make meaningful and effective decisions regarding greenhouse gas reductions, it is important to understand the scientific and regulatory framework under which this Plan has been developed. This section provides a brief introduction to the scientific research efforts to understand how climate change occurs and its global implications and describes the federal, state, regional, and local regulations that provide guidance and inform the development of this Plan.

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases faster than the earth's natural systems can absorb them. These gases are released as byproducts of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities. While often used interchangeably, there is a difference between the terms "climate change" and "global warming." According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period of time that can be caused by both natural factors and human activities. Global warming, on the other hand, is an average increase in the temperature of the atmosphere caused by increased greenhouse gas emissions. The use of the term "climate change" is becoming more prevalent because it encompasses all changes to climate, not just temperature.

The Greenhouse Effect

Without the natural greenhouse effect, the average global temperature would be zero degrees Fahrenheit, and life on earth would not be possible.

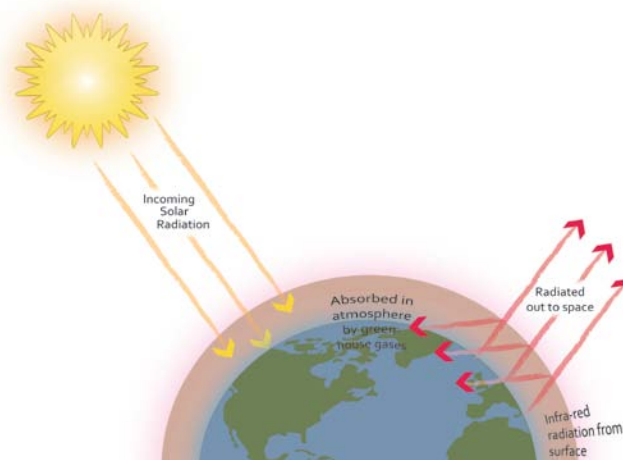
Source: National Oceanic and Atmospheric Administration, National Climatic Data Center 2008.

The Greenhouse Effect

The release of gases, such as carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O), creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space (**Figure 2**). While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of greenhouse gases beyond natural levels. The overabundance of greenhouse gases in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

Our planet is reliant on the greenhouse effect, which results when the atmosphere captures the heat that radiates away from the earth toward space. Several gases in the atmosphere function as barriers and trap heat within the planet's atmosphere, including water vapor, carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons. These gases function similar to glass on a greenhouse; the glass panes of a greenhouse allow sunlight to pass into the building but trap heat within it, preventing heat from escaping.

FIGURE 2 – THE GREENHOUSE EFFECT



Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. 2008. NOAA Satellite and Information Service.

Climate Change Impacts

The continued release of greenhouse gases at or above the current rate will continue to increase average temperatures around the globe. These increases in global temperatures are likely to change our planet's climate in ways that will have significant global, regional, and local long-term effects.

Global Climate Change Impacts

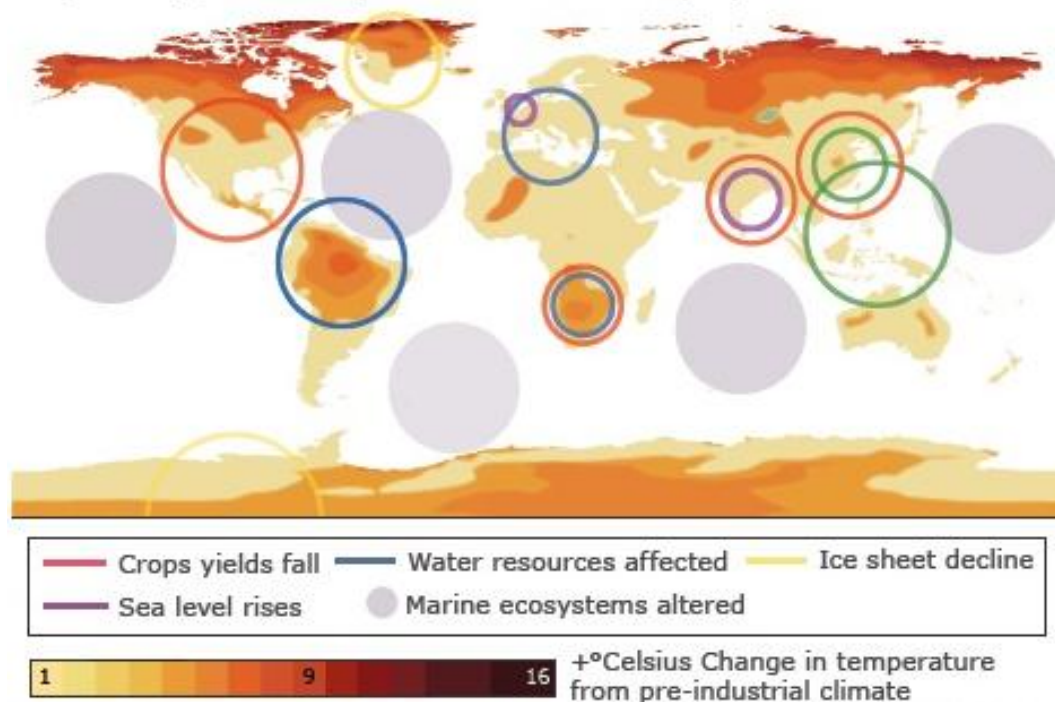
The Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment Report's Working Group I Summary for Policymakers summarizes current scientific understanding of global climate change and projects future climate change using the most comprehensive set of recognized global climate models. The report incorporates the current effects of global climate change and includes an increase in tropical cyclone intensity, a loss in seasonally frozen ground, and an increase in drought intensity.

As asserted in the IPCC Fourth Assessment Report, if trends remain unchanged, continued GHG emissions above current rates will induce further warming changes in the global climate system and pose even greater risks than those currently witnessed. The impact of additional warming on the global climate is shown in **Figure 3**. Given the scientific basis of climate change and expected trends, the challenge remains to prepare for and mitigate climate change through deliberate global and local action.

What is the IPCC?

The Intergovernmental Panel on Climate Change (IPCC) is an organization created by the United Nations Environmental Programme and the World Meteorological Organization to provide a global scientific view on the current state of climate change and its potential environmental and socioeconomic impacts.

FIGURE 3 – POTENTIAL GLOBAL CLIMATE CHANGE IMPACTS
Impact of global temperature rise of 4C (7F)

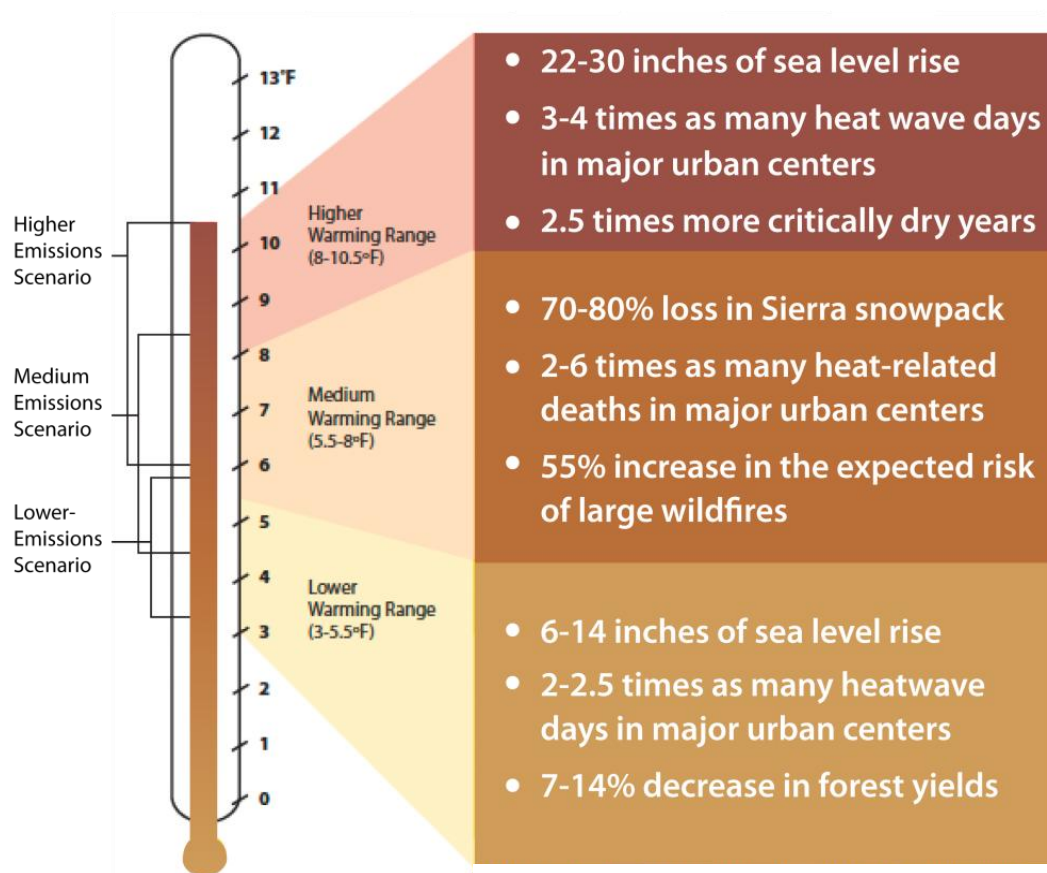


Source: Met Office, Hadley Centre 2009

Climate Change Impacts to California

Research suggests that California will experience hotter and drier conditions, reductions in winter snow and increases in winter rains, sea level rise, significant changes to the water cycle, and an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state. To refrain from action is costly and risky; the California Climate Adaptation Strategy estimates that no action to address the potential impacts of climate change will lead to economic losses of “tens of billions of dollars per year in direct costs” and “expose trillions of dollars of assets to collateral risk.” Potential impacts in California due to climate change are summarized in **Figure 4**.

FIGURE 4 – CALIFORNIA CLIMATE CHANGE IMPACTS, 2070–2099



Source: California Energy Commission. 2006. *Our Changing Climate: Assessing the Risks to California*. Web Document. Sacramento: California Energy Commission.

Increased Rate of Wildfires

Wildfire risk is based on a combination of factors including rainfall, winds, temperature, and vegetation. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. Even under the “medium” warming scenario predicted by the Intergovernmental Panel on Climate Change, wildfire

risk will likely increase by 55% in California. Further, as wildfires increase in frequency and size, they will also increase in intensity.

Negative Impacts on Wildlife

As temperatures rise, species are moving north in California or to higher elevations. This migrational change disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change. Those species that are unable to migrate face the danger of extinction: “The amount of future warming expected in California may likely exceed the tolerance of endemic species (i.e., those that are native to a specific location and that only occur there) given their limited distribution and microclimate” (California Natural Resources Agency 2009).

Reduction in soil moisture will result in early dieback of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but with a limited ability to adapt to new climates, the potential for severe species loss is present.

Several potential hydrological changes associated with global climate change could also specifically influence the ecology of aquatic life in California and have several negative effects on cold-water fish. For example, if a rise in air temperature by just a few degrees Fahrenheit occurs, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp. Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults or juveniles or both.

Deteriorating Public Health

Heat waves are expected to have a major impact on public health, as well as decreasing air quality and increasing mosquito breeding and mosquito-borne diseases. Further, climate change is expected to alter the spread and prevalence of disease carrying insects, organisms, or people, referred to as vectors, in addition to leading to a possible decrease in food quality and security. Vector control districts throughout the state are already evaluating how they will address the expected changes to California’s climate.

According to a new report from the California Air Resources Board (CARB), the warming climate will increase ozone levels in California’s major air basins, leading to upwards of 6 to 30 more days per year with ozone concentrations that exceed federal clean-air standards.

Cost-effective measures to reduce greenhouse gas emissions and protect public health are important for local governments. The new CARB study provides evidence of what is becoming known as the “climate penalty,” where rising temperatures increase ground-level ozone and airborne health-damaging particles, despite the reductions achieved by programs targeting smog-forming emissions from cars, trucks, and industrial sources. The elderly, young, and sensitive populations most likely to be impacted by climate change are also those that often lack sufficient resources to adapt. Such vulnerable demographics are likely to need assistance to respond to climate change. Social equity issues related to the unequal distribution of resources and increased costs to address

community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on local governments.

Decreased Supply of Fresh Water

The state's water supply is already under stress and is anticipated to shrink under even the most conservative climate change scenario. Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpack melts in the spring. The Sierra snowpack is estimated to experience a 25% to 40% reduction from its average by 2050. With rain and snow events becoming less predictable and more variable, the rate of flooding could increase and California's ability to store and transport fresh water for consumption could decrease. Further, warmer weather will lead to longer growing seasons and increased agricultural demand for water.

Increased Severity and Frequency of Flood Events

Forecasts indicate more intense rainfall events, generating more frequent or extensive runoff, and flooding may result from a changing climate. Localized flood events may increase in periods of heavy rain. As explained by the Climate Adaptation Strategy, California's water system is structured and operated to balance between water storage for dry months and flood protection during rainy seasons. Although climate change is likely to lead to a drier climate overall, risks from regular, more intense rainfall events can generate more frequent and/or more severe flooding that upsets this managed balance between storage and protection. Additionally, erosion may increase and water quality may decrease as a result of increased rainfall amounts.

Rising Sea Levels

Sea level rise is attributed to the increase of average ocean temperatures and the resulting thermal expansion and the melting of snow and ice contributing to the volume of water held in the oceans. While many effects of climate change will impact Sunnyvale, sea level rise is one specific impact that has been extensively studied and quantified, and its effects mapped. The San Francisco Bay Conservation and Development Commission (BCDC) has led research efforts on sea level rise in the Bay Area and issued a report on sea level rise in April 2009, which states that sea levels in the Bay Area will rise 16 inches by mid-century and 55 inches by the end of the century. Approximately 180,000 acres of the Bay Area could be inundated by mid-century, and 213,000 acres could be flooded by the end of the century, including 93 percent of both the Oakland and the San Francisco airports.

The speed and amount of sea level rise will be influenced by the increase in average temperatures and rate of melting of glacial ice. While there is a degree of uncertainty in projections, the actual rate of sea level rise is occurring more quickly than many previous projections had estimated.

REGULATORY CONTEXT

Sunnyvale's climate action efforts will be implemented within a robust federal, state, regional, and local framework. Although the federal government has yet to enact legislative targets for reducing greenhouse gas emissions, California was the first state in the nation to adopt GHG emissions reduction targets in 2006 under Assembly Bill 32

(AB 32). This section highlights the federal and state legislative framework guiding the preparation and implementation of this Plan.

Federal Framework

While current federal government regulations lack strict emissions reduction targets, the federal government is supporting emissions reduction efforts of state and local governments in a variety of ways. Numerous proposals are currently under way at the federal level to limit emissions from power plants, impose pricing on carbon emissions, and provide federal energy efficiency legislation.

Federal agencies have undertaken a concerted effort to assist state and local governments, businesses, and residents with efforts related to energy, climate action planning, and smart growth. The Environmental Protection Agency (EPA) also provides educational resources and tools in support of GHG analysis and climate action planning.

Clean Air Act

The Clean Air Act, the nation's landmark legislation to protect air quality and public health, was signed by President Richard Nixon in 1970. The law defines the EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. Implementation of programs and enforcement of the Clean Air Act is a collaborative effort between the EPA, states, regional agencies, and local governments. The EPA's analysis of the economic impact of implementing the Clean Air Act estimates that the costs to comply with the Clean Air Act are outweighed by the public health benefits by a ratio of more than 30 to 1.

In December 2009, the US EPA Administrator signed two findings related to greenhouse gas emissions under the Clean Air Act. The endangerment finding recognized that greenhouse gases such as carbon dioxide, methane, and nitrous oxide in the atmosphere threaten the public health and welfare of current and future generations. The cause or contribute finding recognized that fuel combustion from motor vehicles contributes to the greenhouse gas emissions that endanger public health and welfare. These two findings did not impose any direct requirements on industry or any other entities. This action, however, was a prerequisite for implementing greenhouse gas emissions standards for vehicles in collaboration with the National Highway Traffic Safety Administration.

Federal GHG Reduction Initiatives

The federal government is currently employing voluntary and incentive-based programs to curb greenhouse gas emissions through energy efficiency improvements, renewable energy development, methane capture, and improved agricultural practices. In addition

The Clean Air Act saves lives

Between 1990 and 2010, it is estimated that the Clean Air Act has resulted in the avoidance of following public health issues:

- Adult Mortality – 160,000
- Infant Mortality – 230
- Mortality Ozone – 4,300
- Chronic Bronchitis – 54,000
- Heart Disease – 130,000
- Asthma Exacerbation – 1,700,000
- Emergency Room Visits – 86,000
- Lost School Days – 3,200,000
- Lost Work Days – 13,000,000

Source: EPA 2011. The Benefits and Costs of the Clean Air Act from 1990–2020.

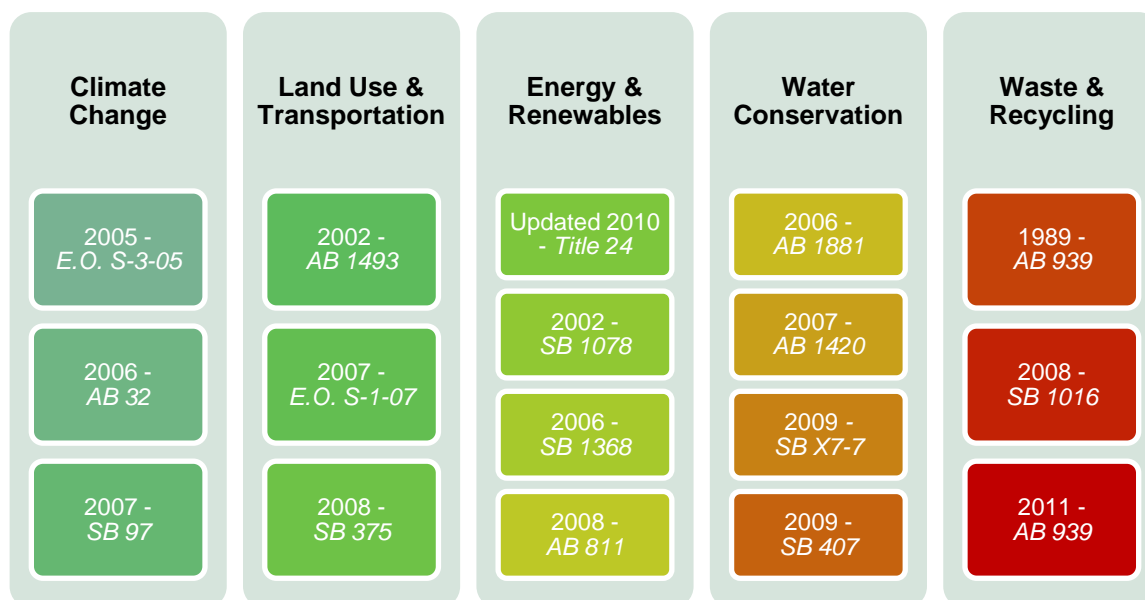
to the significant research efforts related to climate change and GHG reductions, programs such as ENERGY STAR, Climate Leaders, and the Smart Way program encourage emission reductions from large corporations, consumers, industrial and commercial buildings, and many major industrial sectors.

California Legislative Framework

The State of California is the 15th largest emitter of greenhouse gases in the world, ultimately accounting for 2% of global greenhouse gas emissions. However, the State has been proactive in working to reduce emissions and has a long history of proven leadership in addressing energy and climate issues spanning the last 40 years. In 1988, Assembly Bill (AB) 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for climate change issues in California. Since that time, there have been numerous initiatives in California to address climate change and energy efficiency, with the majority of legislation passed between 2000 and now. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created ambitious targets and regulations that will directly lead to reductions in greenhouse gas emissions. Not only have California's efforts earned it a role as the leader in the United States for climate planning strategies, but the State has received world attention and accolades for its efforts.

California legislation related to climate change includes Executive Order S-3-05, Assembly Bill 32, and Senate Bill (SB) 375, which direct the State and other local agencies to reduce GHG emissions. These orders and laws are summarized below. In addition to Executive Order S-3-05, AB 32, and SB 375, the State has enacted legislation and policy initiatives related to climate change, transportation and vehicle efficiencies, energy, water, and solid waste. A summary of recent state efforts by topic is provided in **Figure 5**, with a more detailed discussion of recent climate change legislation provided below.

FIGURE 5 – CALIFORNIA REGULATORY FRAMEWORK SUMMARY



Governor's Executive Order S-3-05

Executive Order S-3-05 establishes the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the (nonbinding) progressive greenhouse gas emissions reduction targets outlined in the executive order for the state:

- By 2010, reduce greenhouse gas emissions to 2000 levels;
- By 2020, reduce greenhouse gas emissions to 1990 levels;
- By 2050, reduce greenhouse gas emissions to 80% below 1990 levels.

AB 32 – California Global Warming Solutions Act of 2006

Assembly Bill 32, known as the California Global Warming Solutions Act, was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020. Mandatory actions under the legislation to be completed by CARB include:

- Identification of early action items that can be quickly implemented to achieve greenhouse gas reductions. These early action items were adopted by CARB in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.
- Development of a scoping plan to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The scoping plan employs a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program. The plan identifies local governments as strategic partners to achieving the state goal and translates the reduction goal to a 15% reduction of current emissions by 2020.
- Creation and adoption of regulations to require the state's largest industrial emitters of greenhouse gases to report and verify their greenhouse gas emissions on an annual basis.

SB 375 – Sustainable Communities & Climate Protection Act of 2008

Senate Bill 375 builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires metropolitan planning organizations (MPOs) to create a Sustainable Communities Strategy (SCS) in their regional transportation plans (RTPs) for the purpose of reducing urban sprawl. The SCS adopted by ABAG in 2013 demonstrates how the region will achieve the greenhouse gas emissions reduction target set by CARB for 2020 and 2035.

SB 97 – CEQA Guideline Amendments of 2007

Senate Bill 97 was adopted in 2007 by the State of California and directed the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to address greenhouse gas emissions. The CEQA Guidelines prepared by OPR were adopted in December 2009 and went into effect March 18, 2010. Local governments may use adopted plans consistent with the CEQA Guidelines to assess the cumulative impacts of projects on climate change, if the adopted plan includes a certified environmental impact report (EIR) or adoption of an environmental document. In order to benefit from the streamlining provisions of the CEQA Guidelines, a plan for the reduction of greenhouse gas emissions must accomplish the following:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;
- Be adopted in a public process following environmental review.

In response to the updated CEQA Guidelines, the Bay Area Air Quality Management District (BAAQMD) has adopted thresholds of significance for greenhouse gas emissions. These thresholds are used in the environmental review process for plans and projects by local governments and may streamline the environmental review process.

BAAQMD Guidance and CEQA Tiering

The BAAQMD CEQA Air Quality Guidelines were developed to assist lead agencies in evaluating air quality impacts for projects and plans in the San Francisco Bay Area Air Basin. The guidelines were updated in 2010 to include guidance on assessing greenhouse gas and climate change impacts as required under CEQA Guidelines Section 15183.5(b) and to establish thresholds of significance for impacts related to GHG emissions. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project's impact on GHG emissions is less than significant if it is in compliance with a Qualified GHG Reduction Strategy.

This CAP follows both the CEQA Guidelines and the BAAQMD guidelines by incorporating the standard elements of a Qualified GHG Reduction Strategy. Appendix C describes in detail how the CAP satisfies the BAAQMD's requirements for a Qualified GHG Reduction Strategy and will allow future projects to determine that a project has a less than significant impact on GHG emissions if it complies with the City's CAP.

CHAPTER 2



GHG INVENTORY & FORECAST

The baseline greenhouse gas (GHG) emissions inventory identifies the major sources of GHG emissions within the City of Sunnyvale and provides a baseline against which future progress can be measured.

GREENHOUSE GAS INVENTORY

The baseline greenhouse gas (GHG) emissions inventory identifies the major sources of GHG emissions within the City of Sunnyvale and provides a baseline against which future progress can be measured.

Specifically, this inventory does the following:

- Calculates GHGs from community-wide activities in the calendar year 2008.
- Converts activity data into GHG emissions by activity sector to easily compare the GHG impact between sectors.
- Provides City decision-makers and the community with adequate information to inform policy decisions.
- Forecasts how emissions will grow in the community if no behavioral changes are made.

How is an inventory different from a carbon footprint?

A GHG emissions inventory incorporates GHG emissions that occur within the boundaries of a city based on adopted protocols and industry standards. The consistency allows GHG inventories to be compared and used in policy decisions. On the other hand, a carbon footprint includes GHG emissions from the region, and it is difficult to accurately estimate the community's contribution to the carbon footprint. Accordingly, a carbon footprint has limited value as a basis for policy decisions.

Inventory Background and Methodology

The starting point of the Climate Action Plan is to measure or inventory Sunnyvale's current or baseline levels of GHG emissions. The City's GHG inventory is guided by the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) Air Quality Guidelines, adopted in June 2010 and updated in October 2011. The guidelines include an appendix entitled "Recommended Plan-Level GHG Quantification Guidance." The guidance is recommended for any plan or program that will be used as a programmatic tiering document under CEQA according to BAAQMD's definition of a Qualified GHG Reduction Strategy. The guidelines indicate that the following sources are to be included in any inventory that will be used in a Qualified GHG Reduction Strategy:

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

The GHG emissions inventory starts with collecting activity data for each sector listed above, such as the kilowatt-hours (kWh) of electricity used or therms of natural gas used for the residential, commercial, and industrial energy sectors, the vehicle miles traveled (VMT) for the transportation sector, or million gallons (MG) of water used by the community in a single calendar year. These activities are converted into GHG emissions using an emissions factor or coefficient. These emissions factors are supplied by the energy provider or emissions modeling software and indicate the GHGs that are emitted for every kWh produced, mile traveled, or ton of waste disposed.

The inventory measures three primary GHG emissions—carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). These GHGs are then converted to carbon dioxide equivalents (CO₂e), enabling the City to consider different GHGs in comparable terms. The conversion of GHGs is done by comparing the global warming potential (GWP) of each gas to CO₂. For example, methane is 21 times more powerful than CO₂ on a per weight basis in its capacity to trap heat, and therefore one metric ton of CH₄ would be calculated as 21 metric tons of CO₂e, while nitrous oxide (N₂O) is 310 times more powerful than CO₂ and would be calculated as 310 metric tons of CO₂e.

2008 Baseline Inventory Results

A baseline GHG emissions inventory and forecast are the basis of any climate action plan analysis. This section provides a brief overview of Sunnyvale's 2008 baseline emissions. The community of Sunnyvale emitted approximately 1,270,170 metric tons of carbon dioxide equivalents (MTCO₂e) in the baseline year 2008. **Figure 6** summarizes the activity data, GHG emissions, and each sector's contribution to Sunnyvale's GHG emissions.

FIGURE 6 – SUNNYVALE'S GHG EMISSIONS BY SECTOR

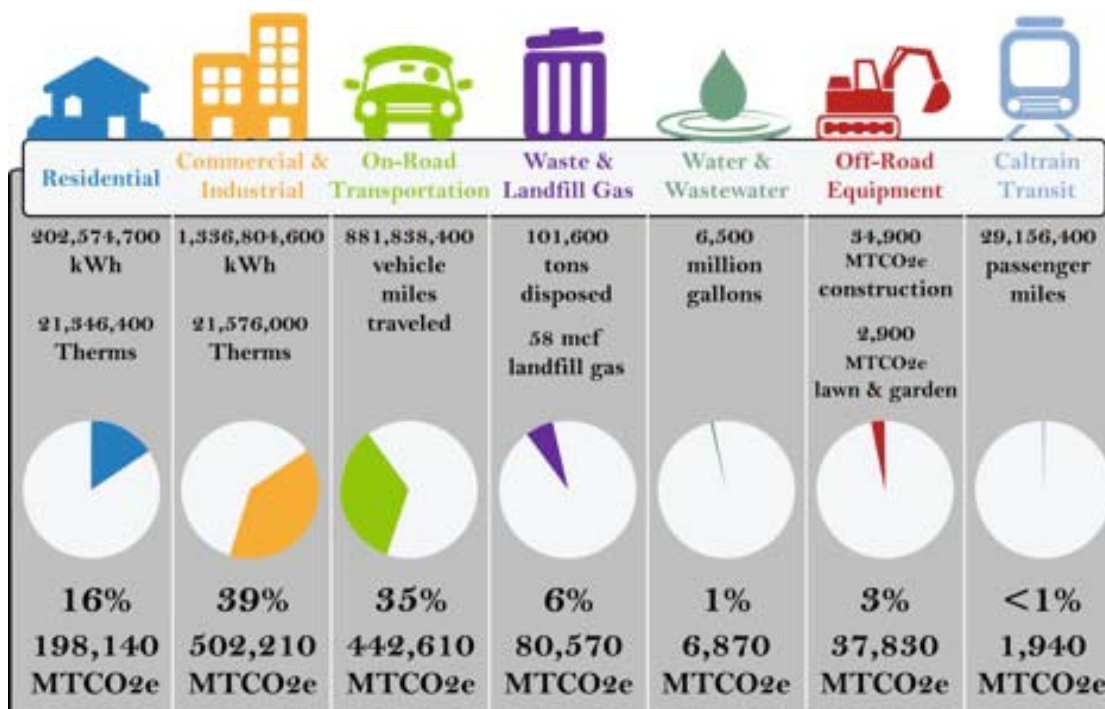


Figure 7 and **Table 2** compare each sector's contribution to the community's overall GHG emissions in 2008. The commercial/industrial energy sector is the largest contributor at 39%, producing approximately 502,210 MTCO₂e in 2008. Emissions from the transportation sector were the next largest contributor, accounting for 35% of the total emissions, or approximately 442,610 MTCO₂e. The residential sector accounted for 16% of the total emissions (198,140 MTCO₂e), and emissions from solid waste comprised 6% of the total (76,970 MTCO₂e). Emissions were also inventoried for landfill gas emitted from Sunnyvale's closed landfill, off-road equipment, water consumption, and Caltrain trips to and from Sunnyvale. Together, these sources contribute approximately 4% of total community-wide emissions and are shown in **Figure 7** as other emissions sources.

FIGURE 7 – 2008 BASELINE GREENHOUSE GAS EMISSIONS BY SECTOR

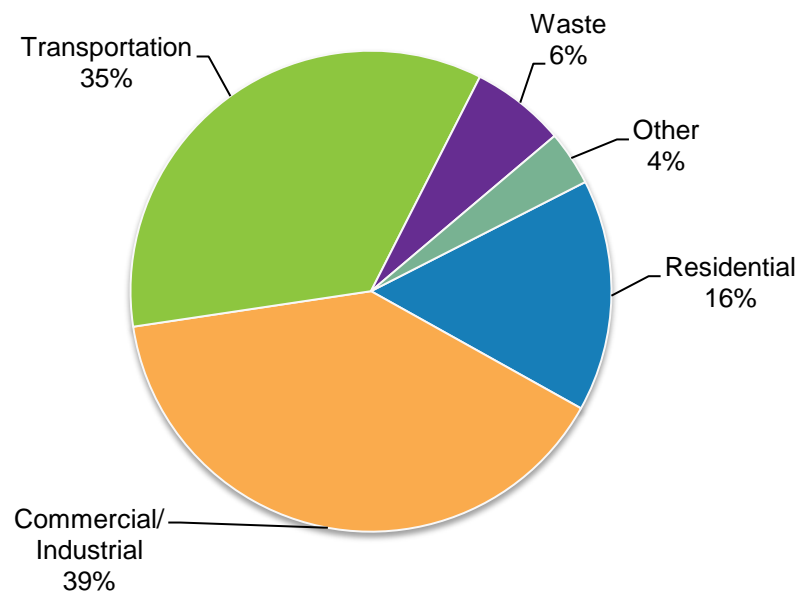


TABLE 2 – 2008 BASELINE GREENHOUSE GAS EMISSIONS BY SECTOR

2008 Baseline Greenhouse Gas Emissions	MTCO ₂ e	Percentage of Total
Residential	198,140	16%
Commercial/Industrial	502,210	39%
Transportation	442,610	35%
Community Waste	76,970	6%
Landfill Gas	3,600	<1%
Water	6,870	1%
Off-Road	37,830	3%
Caltrain	1,940	< 1%
Total	1,270,170	100%

GREENHOUSE GAS EMISSIONS FORECAST

A GHG emissions forecast is an estimate of how emissions will grow based on the City's household, jobs, and population growth projections. To estimate the GHG reductions that will be needed to reach the Assembly Bill (AB) 32 target, Sunnyvale's GHG emissions must be forecast based on anticipated growth in households, jobs, and population.

Business-As-Usual GHG Emissions Forecast

A business-as-usual (BAU) forecast analyzes how emissions will grow if per capita consumption trends and efficiencies remain at their 2008 level, yet the number of jobs, households, and people in Sunnyvale continues to grow. In other words, the BAU is the status quo scenario before state, regional, and local reduction efforts are taken into consideration. The BAU projection utilizes the demographic projections included in the adopted General Plan for population, households, and jobs in Sunnyvale by 2035. **Table 3** identifies the population, jobs, households, and service population numbers utilized to forecast Sunnyvale's GHG emissions.

TABLE 3 – SUNNYVALE ADOPTED GENERAL PLAN GROWTH SCENARIO

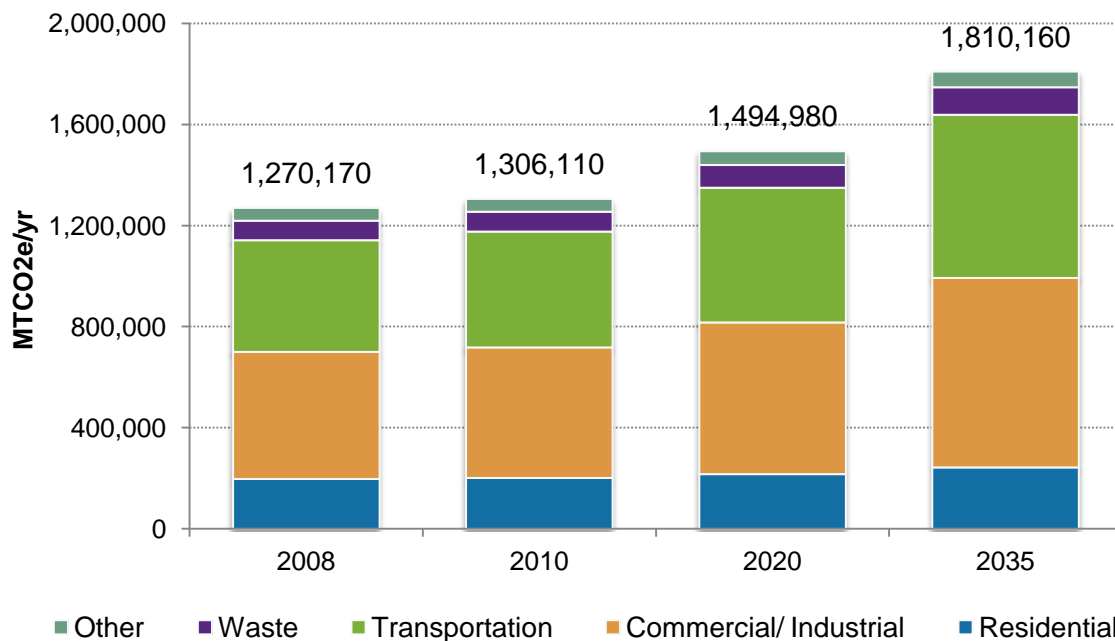
	2008	2010	2020	2035	Percentage Change
Population	133,110	135,100	145,020	159,910	20%
Households	54,130	55,050	59,660	66,570	23%
Jobs	73,630	76,320	89,750	109,900	49%
Service Population	206,740	211,420	234,770	269,810	31%

The growth scenario in the adopted General Plan provides the basis for the City's BAU forecast of GHG emissions. This inventory and forecast includes a 2010 GHG emissions estimate and a BAU forecast for the years 2020 and 2035 based on the land use and growth assumptions included in the General Plan. The 2010 estimate of GHG emissions is provided for context and allows the City to take credit for the actions of the City and the community to reduce GHG emissions prior to the development of the Climate Action Plan. **Table 4** and **Figure 8** summarize the growth forecast of GHG emissions by activity sector without any actions or policies in place to reduce GHG emissions. Under the growth scenario, emissions would grow by 18% in 2020 to 1,494,980 MTCO₂e and by 43% from baseline to 1,810,160 MTCO₂e in 2035.

**TABLE 4 – SUNNYVALE BUSINESS-AS-USUAL GHG EMISSIONS
FORECAST (MTCO₂E)**

Sector	Source	2008 Baseline	2010 Estimate	2020 Forecast	2035 Forecast
Residential	Electricity	84,850	86,160	93,020	104,350
	Natural Gas	113,290	115,040	124,200	139,320
Commercial/ Industrial	Electricity	387,700	399,380	463,240	578,680
	Natural Gas	114,510	117,950	136,820	170,910
Transportation	VMT	442,610	457,680	533,070	646,150
Landfilled Waste	Commercial	51,570	53,120	61,620	76,970
	Residential	25,400	25,790	27,850	31,240
Landfill Gas	Landfill Gas	3,600	3,460	2,830	2,100
Water	Gallons	6,870	7,000	7,730	8,960
Off-Road	Construction	34,930	35,620	39,310	45,580
	Lawn & Garden	2,900	2,940	3,180	3,560
Caltrain	Trips	1,940	1,970	2,110	2,340
TOTAL		1,270,170	1,306,110	1,494,980	1,810,160
Percentage Change Since Baseline			3%	18%	43%

* The 2010 and 2020 business-as-usual growth forecasts are linear interpolations of the growth between 2008 and 2035 under the adopted General Plan growth scenario.

**FIGURE 8 – SUNNYVALE BUSINESS-AS-USUAL GHG EMISSIONS
FORECAST (MTCO₂E)**

BAU emissions related to energy, water, wastewater, waste, off-road equipment, and Caltrain ridership are anticipated to grow linearly with residential, commercial, and population growth. On-road VMT in the BAU scenario for 2035 were modeled using the Sunnyvale Travel Demand Forecasting Model and include regional transportation improvements identified in the Valley Transportation Plan 2030 published by the Santa Clara Valley Transportation Authority. 2010 and 2020 VMT forecasts were determined by linearly interpolating between the 2008 baseline year results and the 2035 results using the interim-year projections.

Adjusted Forecast to Incorporate Existing State and Regional Programs

Select state and regional sustainability efforts will have a substantial impact on local GHG emissions. The state and regional efforts described below are incorporated into an adjusted business-as-usual forecast (ABAU) to clearly identify how those policies will reduce Sunnyvale's GHG emissions. The state and regional programs evaluated in this adjusted forecast include those discussed below.

California Building Code, Title 24

The calculation of CALGreen energy reductions assumes that all development between 2010 and 2035 will meet Title 24 2008 minimum efficiency standards. It also assumes that all growth in the natural gas and electricity sectors is from new construction. Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. The 2010 triennial edition of Title 24 pertains to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. This Climate Action Plan focuses on two sections of Title 24, Part 6, the California Energy Code, and Part 11, the California Green Building Standards Code or CALGreen Code. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

Part 6, 2008 Building Energy Efficiency Standards

The most recent update to Title 24, Part 6, the California Energy Code, went into effect on January 1, 2010, for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.

Part 11, 2010 California Green Building Code

California is the first state in the nation to adopt a mandatory green building code, the California Green Building Standards Code, or CALGreen. The CALGreen Code was updated in 2010 and became a mandatory code beginning January 1, 2011. The code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen Code and may elect to adopt one of the two additional tiers.

Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24, Part 6 standards. However, if a local government elects to adopt either tier of CALGreen, additional prerequisites and electives must be implemented by new development projects subject to CALGreen. For the voluntary energy efficiency prerequisites, Tier 1 includes a 15% improvement and Tier 2 includes a 30% improvement over minimum Title 24, Part 6 requirements. The City of Sunnyvale has adopted the Tier 1 standards of CALGreen.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction.

Clean Car Fuel Standards (AB 1493, Pavley)

Signed into law in 2002, AB 1493 requires automobile makers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 when the US Environmental Protection Agency (EPA) issued a waiver confirming California's right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, while simultaneously improving fuel efficiency and reducing motorists' costs.

Renewables Portfolio Standard

California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country, mandating that 33% of electricity delivered in California is generated by renewable sources like solar, wind, and geothermal by 2020. The California RPS was first codified in 2002 by Senate Bill (SB) 1078 (requiring 20% renewable electricity mix by 2010) and further strengthened in April 2011 with the adoption of SB X 1-2 (requiring 33% renewable electricity mix by 2020). The RPS intends to boost the economy and establish California as a center for the development and use of renewable energy. Only Hawaii's electricity standard of 40% renewable by 2030 surpasses California renewable energy standards.

Despite the 2020 goal of California's RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. In 2010, the California Public Utilities Commission reported that 18% of California's electricity came from renewable sources, missing the 20% goal by 2%. California utilities have more than enough renewable electricity under consideration to meet the 33% target by 2020. However, due to contract and transmission limitations, not all of this new electricity will be available in time to meet the goals. Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

Caltrain Electrification

The Peninsula Corridor Joint Powers Authority is well on its way to modernizing the Caltrain system, which includes an electrification project in operation by 2018. This improvement is anticipated to reduce emissions by as much as 90% over the current diesel-run locomotives.

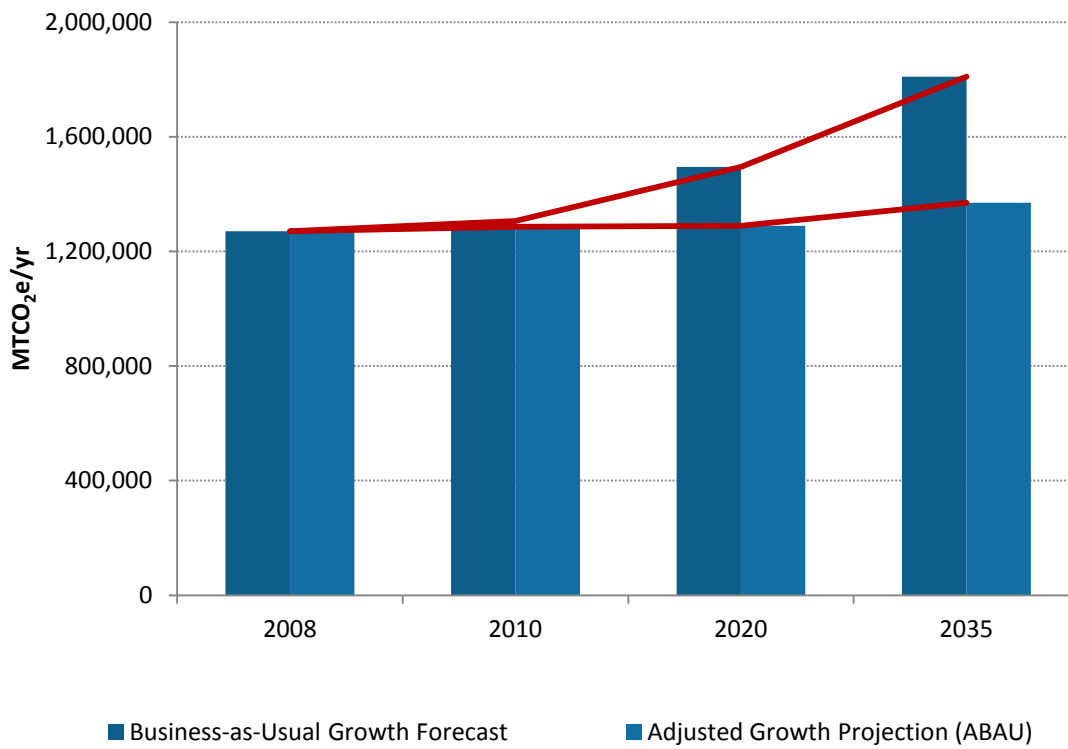
The GHG impact of state and regional efforts is shown in **Table 5**. As outlined in the table, state efforts reduce BAU emissions by 205,060 MTCO₂e in 2020 and by 440,650 MTCO₂e in 2035

TABLE 5 –SUMMARY OF STATE AND REGIONAL EFFORTS (MTCO₂E)

	2008	2010	2020	2035
BAU Forecast	1,270,170	1,306,110	1,494,980	1,810,160
BAU Forecast Growth Percentage		3%	18%	43%
Pavley I – Clean Car Fuel Standard	–	0	-81,150	-159,460
Renewables Portfolio Standard	–	-19,700	-90,800	-173,690
CALGreen & 2008 Title 24 Standards	–	0	-31,210	-105,400
Caltrain Electrification	–	0	-1,900	-2,100
Total State/Regional Reductions	–	-19,700	-205,060	-440,650
Adjusted BAU Forecast	1,270,170	1,286,410	1,289,920	1,369,510
ABAU Forecast Growth Percentage	0%	1%	2%	8%

Figure 9 identifies how the ABAU projection will influence the City's emissions when compared to the BAU forecast. Implementation of the state and regional policies and programs listed above will lessen the City's projected growth in GHG emissions from 18% to 2% by 2020 and from 43% to 8% by 2035.

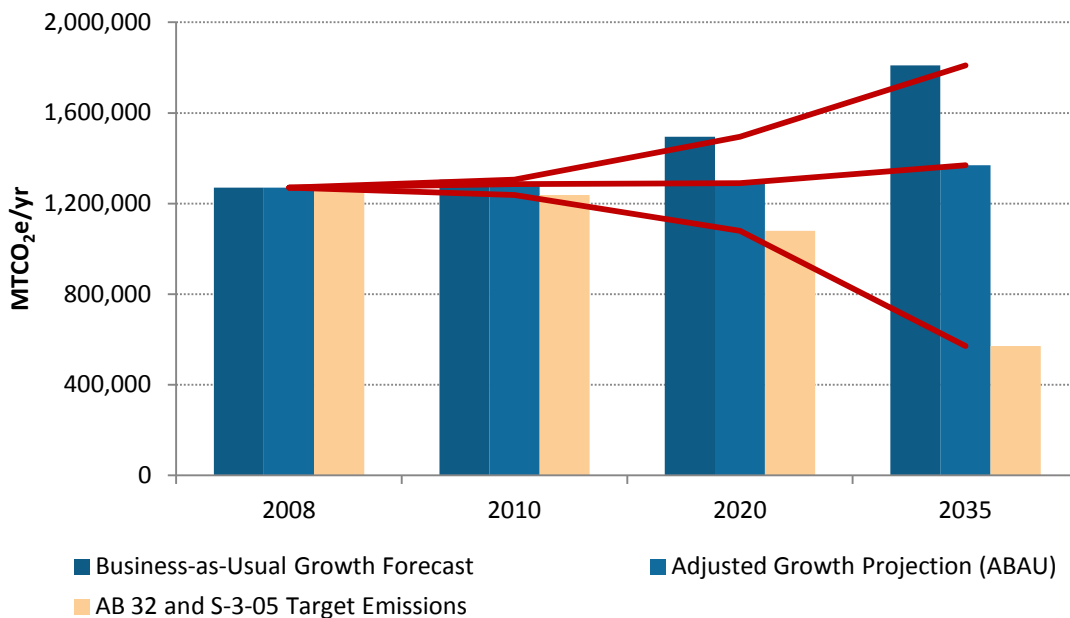
FIGURE 9 – 2008–2035 SUNNYVALE BAU AND ABAU FORECAST (MTCO₂E)



GHG REDUCTION TARGETS

While these reductions represent a significant reduction, AB 32 recommends that local governments adopt a GHG reduction target of 15% below present (2005–2008) levels by 2020. Furthermore, former Governor Schwarzenegger signed Executive Order S 3-05 in 2005 to establish a statewide goal of achieving an 80% reduction below 1990 GHG emissions levels by 2050. The Executive Order S-3-05 reduction goal would be equivalent to a 95% reduction below 2008 emissions in Sunnyvale by 2050.

After state and regional efforts are factored into Sunnyvale's growth forecast, the City's challenge to meet the GHG reduction targets of 15% below baseline levels by 2020 and progress toward the 80% below 1990 levels by 2050 will be fulfilled by the Climate Action Plan. **Figure 10** identifies the gap between the City's GHG emissions forecast and the GHG reduction targets if there are not policies and programs developed to reduce GHG emissions.

FIGURE 10 – GREENHOUSE GAS EMISSIONS FORECASTS AND STATE REDUCTION TARGETS

This Climate Action Plan identifies GHG reduction strategies to close the gap between the ABAU forecast and the target emissions, as depicted in **Figure 10**. This Climate Action Plan identifies GHG reduction strategies to reduce emissions by a minimum of 241,550 MTCO₂e, or 17% of total baseline emissions, to reach the GHG reduction target by 2020.

CHAPTER 3

GHG EMISSIONS REDUCTION STRATEGIES

The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs for both new and existing development. The reduction measures also aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target.



The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs for both new and existing development. The reduction measures also aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. The following chapter describes the process for developing, refining, and quantifying the GHG reduction goals, strategies, and actions identified to achieve the City's GHG reduction targets.

REDUCTION STRATEGY STRUCTURE

In order to achieve the state-recommended reduction target of 15% below 2008 emissions levels by 2020, the City of Sunnyvale will need to achieve the goals and implement the policies and actions set forth in this chapter. The City's strategy is structured around the ten topic areas identified in **Figure 11**.

FIGURE 11 – GHG REDUCTION GOALS

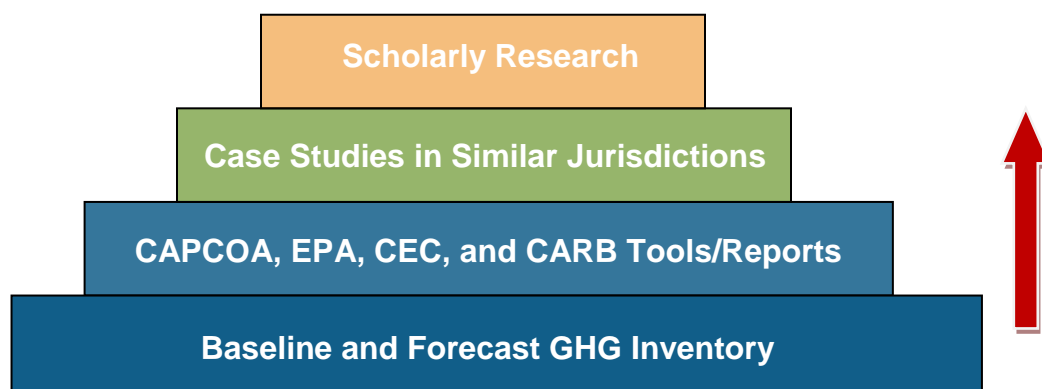


Each topic area has a corresponding goal, reduction measures, and supporting actions necessary for implementation. The process for developing GHG reduction measures included a review of existing policies, activities, and programs; identification of topic areas or goals based on the City's emissions inventory and sustainability vision; and preparation of preliminary reduction measure language with performance targets and indicators. The preliminary measures were refined through the staff and community engagement process and evaluated for political, technical, and financial feasibility (see **Figure 12**). The final step to developing each GHG reduction measure is to identify how each policy will be successfully implemented by determining the GHG reduction benefit, the time frame for implementation, the estimated costs and savings to the community and the City, potential sources of funding, the department responsible for implementation, and the additional benefits, or co-benefits, that may occur from implementation of each measure.

FIGURE 12 – GHG REDUCTION MEASURE DEVELOPMENT PROCESS

The GHG reduction benefit of each measure is determined by a change in operation, activity, or efficiency. In general, there are three types of reductions in climate action plans: (1) avoided emissions, (2) greater efficiency, and (3) sequestration. GHG reduction estimates are identified for 2015, 2020, and 2035.

The information used to estimate GHG emissions reductions is summarized in **Figure 13**. The baseline GHG inventory and forecast serve as the foundation for quantifying the City's GHG reduction measures. Activity data from the inventory, e.g., vehicle miles traveled (VMT) and kilowatt-hours (kWh) of electricity, is combined with the performance targets and indicators identified in this Plan to calculate the GHG reduction benefit of each measure. This approach ensures that the City's GHG reductions are tied to the baseline and future activities that are actually occurring in Sunnyvale.

FIGURE 13 – GHG QUANTIFICATION SOURCES AND TOOLS

Whenever possible, emissions reduction estimates are based on tools and reports provided by government agencies such as the US Environmental Protection Agency (EPA), California EPA, California Energy Commission (CEC), California Air Resources Board (CARB), California Air Pollution Control Officers Association (CAPCOA), and local air districts. If accurate reduction estimates are not available through these tools, a case study may be used if the case study is comparable to the conditions in the city. Finally, for more long-range reduction measures that lack actual on-the-ground testing or analysis, current scholarly and peer-reviewed research is combined with knowledge of existing city practices to create a defensible estimate of future emissions reductions.

To demonstrate the types of information and performance indicators that go into quantifying each measure, a detailed example calculation is provided in **Table 6**.

TABLE 6 – EXAMPLE MEASURE QUANTIFICATION

Example Measure: Implement residential energy efficiency program.			
	Quantification Data	Year: 2020	Data Source
A	Total residential electricity use (kWh)	600,000,000	Example GHG Inventory Forecast
B	Total households	100,000	US Census Data
C	Average electricity use per household	6,000	Calculation = A/B
D	Percentage of households participating in program	5%	Measure goal
E	Total households participating in program	5,000	Calculation = B*D
F	Average electricity savings per participant	5%	Case studies from cities A and B
G	Total electricity savings	1,500,000	Calculation = C*E*F
H	Metric ton of CO ₂ e per kWh	0.0002	Example City GHG Inventory
I	Emissions reduction (MTCO ₂ e)	300	Calculation = G*H

The methodology for determining the GHG reduction benefit from each measure is detailed in the GHG technical **Appendix B**, which summarizes the sources and assumptions used to estimate the GHG reductions from each measure.

REDUCTION MEASURE CRITERIA

In order to ensure successful implementation and evaluation of the GHG reduction measures included in this Climate Action Plan, the following criteria have been identified in this Plan or the associated implementation matrix:

- Implementation Time Frame
- Estimated Cost to the City
- Cost and Savings Estimates to the Community
- Implementing Department
- Supporting Agencies
- Community Co-Benefits

Implementation Time Frame: The phase in which this measure should begin implementation. Time frames include:

- Near-Term – before 2016
- Mid-Term – before 2020
- Long-Term – after 2020

Costs and Savings to the City and Community: Plan-level cost estimates are provided to allow for comparison between measures and to assess savings and costs. These costs are based on the best available information at the time this Plan was developed and are represented in total annual costs or savings by 2020. For simplicity, these costs and savings are presented in the following ranges provided in **Table 7**.

TABLE 7 – COSTS AND SAVINGS TO THE COMMUNITY RANGES

Numeric Value (\$)	Range
0	Minimal
1–25,000	Low
25–100,000	Low-Medium
100,000–200,000	Medium
200,000–500,000	Medium-High
500,000–1,000,000	High
Over 1 million	Very High

Implementing Department and Supporting Agencies: City department or division that will take the lead on implementing and reporting process on the selected measure. Other departments and divisions will likely play a major supporting role; however, this department/division is the leader.

Applicability: Designates the type of development to which the measure applies. There are four options:

- Municipal – applies to municipal operations
- New Development – applies to new development applications only
- Existing Development – applies to existing development
- New & Existing Development – applies to new and existing development.

Community Co-Benefits: An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing greenhouse gas emissions. In this document, the co-benefits are defined as follows:



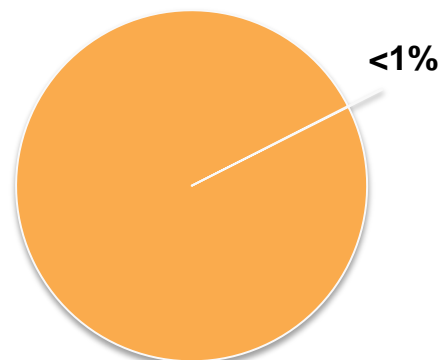
Performance Indicator: Performance indicators and targets are readily available statistics that signify a reduction in GHG. These indicators allow the City to measure progress and track implementation of each measure.

REDUCTION MEASURES

Open Space and Urban Forestry (OS)

Goal: Provide local open space resources that support natural processes and provide rest, relaxation, and recreation opportunities.

Open space refers to natural and built environments within and surrounding the city that provide the community with opportunities for recreation, socialization, and public enjoyment. This goal aims to expand opportunities and access to open spaces such as neighborhood parks, outdoor spaces in commercial or residential areas, and meeting spaces. By providing additional access to these spaces and creating more inviting public environments through urban tree planting, the Sunnyvale community can reduce energy use, sequester carbon, and foster a stronger sense of community. The Horizon 2035 vision is to create a community that has at least 80% of paved areas shaded by tree canopy by 2035.



OS contribution to total GHG reductions

Open Space and Urban Forestry Measures

OS-1 Open Space

Maintain and increase the amount of open space in Sunnyvale consistent with the Council policy and the Consolidated General Plan so that there is a minimum of 5.34 acres per 1,000 population.

Action Items:

- OS-1.1. Achieve and maintain an open space to population ratio of 5.5 acres per 1,000 residents.

OS-1 Key Information

GHG Reductions

2020: 20 MTCO₂e

2035: 50 MTCO₂e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Departments

Community Services &
Community Development

OS-2 Outdoor Meeting Space

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.

OS-2 Key Information

GHG Reductions

2020: Supportive Measure

2035: Supportive Measure

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Community Development

OS-3 Urban Forestry

Increase the number of shade trees planted in the community, and protect the existing tree stock.

Action Items:

- OS-3.1. Continue to implement the City's Tree Preservation requirements.
- OS-3.2. Develop and implement canopy coverage requirements for City-owned parking lots, with exceptions for solar installations.
- OS-3.3. Promote tree planting on private property through incentive and support programs.
- 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.
- 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.

OS-3 Key Information

GHG Reductions

2020: 290 MTCO₂e

2035: 730 MTCO₂e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Department

Public Works

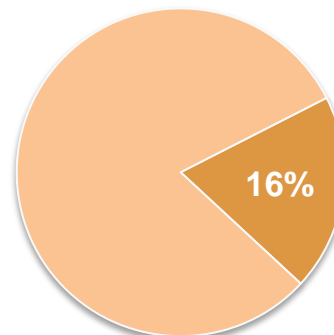
Decrease Energy Consumption (EC)

Goal: Improve energy efficiency and conservation in the community and City operations.

The intent of this goal is to improve the energy efficiency of buildings. Implementation of energy conservation measures will not only reduce GHG emissions but will also reduce household and business costs associated with energy consumption.

Greenhouse gas emissions are created by the consumption of electricity and natural gas. Electricity and natural gas consumption supports businesses, industrial facilities, and homes. Electricity powers appliances that are the cornerstones of daily life, from personal appliances to local infrastructure such as traffic signals. Natural gas is used to heat water, to power natural gas cooking ranges, and in on-site fuel combustion that supports manufacturing and industrial processes.

Greater efficiencies in existing levels of energy consumption can be realized while still supporting the needs of our existing and future community. These measures target efficiencies in electricity and natural gas use in homes and businesses to reduce emissions. In Sunnyvale, where the majority of future GHG emissions will come from existing buildings, it is critical that this Plan include energy conservation measures that focus on improving the efficiency of existing buildings and ensuring that new construction projects utilize electricity and natural gas as efficiently as possible.



EC contribution to total GHG reductions

Decrease Energy Consumption Measures

EC-1 Lighting Efficiency

Increase the use of efficient indoor and outdoor lighting technologies.

Action Items:

- 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.
- 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.
- EC-1.3. Require new private parking lot lighting to use energy-efficient lighting technologies.

EC-1 Key Information

GHG Reductions

2020:	220	MTCO ₂ e
2035:	210	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Departments

Public Works & Community Development

EC-2 New Construction and Remodels

Require green building practices in new residential and commercial development and remodels.

Action Items:

- EC-2.1. Evaluate and update the 2009 Zoning Code for Green Buildings for single-family, multi-family, and nonresidential building construction and major remodels every three to five years consistent with upgrades to the California Green Building Standards Code (CALGreen).
- 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.
- 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.

EC-2 Key Information

GHG Reductions

2020:	4,440	MTCO ₂ e
2035:	10,570	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Community Development

EC-3 Residential Energy Efficiency

Reduce residential energy use, with emphasis on existing homes built before 1990.

Action Items:

- EC-3.1. Establish a residential energy conservation ordinance that requires homeowners to perform and disclose energy and water audits at time of sale.
- 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.
- EC-3.3. Prioritize non-general funds to assist low-income homeowners achieve energy-efficient improvements. Program annual Community Development Block Grant (CDBG) funds to fund weatherization programs.

EC-3 Key Information**GHG Reductions**

2020: 7,350 MTCO₂e

2035: 20,060 MTCO₂e

Co-Benefits**Implementation Time Frame**

Mid-Term

Responsible Department

Community Development

EC-4 Commercial Energy Efficiency

Establish a regulatory and incentive-based structure that facilitates commercial and industrial energy efficiency and conservation.

Action Items:

- 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 the building.
- 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.
- EC-4.3. Create an ordinance to facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships to reduce energy use.

EC-4 Key Information**GHG Reductions**

2020: 47,900 MTCO₂e

2035: 60,520 MTCO₂e

Co-Benefits**Implementation Time Frame**

Near-Term

Responsible Department

Community Development

- 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.

EC-5 Smart Grid

Increase awareness and utilization of real-time energy consumption data and pricing available through PG&E's Smart Meter program.

Action Items:

- EC-5.1. Require new construction and major remodels to install interior real-time energy monitors.
- EC-5.2. Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.
- EC-5.3. Inform the community of metering options, such as online applications and in-home monitors.

EC-5 Key Information

GHG Reductions

2020: 10,300 MTCO₂e
2035: 12,050 MTCO₂e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Department

Community Development

EC-6 "Cool" Roofs and Pavements

Reduce the amount of dark, non-reflective roofing and paving material in order to mitigate the urban heat island effect and reduce energy associated with heating and cooling.

Action Items:

- 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.
- 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.
- EC-6.3. Commit to using a warm aggregate mix for all asphalt patching, overlay, and reconstruction.
- EC-6.4. Consider the lifespan and embedded GHG content of pavement materials for public projects.

EC-6 Key Information

GHG Reductions

2020: 470 MTCO₂e
2035: 1,200 MTCO₂e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Department

Community Development
& Public Works

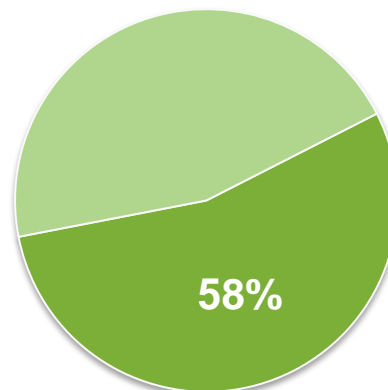
Provide a Sustainable Energy Portfolio (EP)

Goal: Increase the amount of renewable energy produced in the city and facilitate a higher renewable mix for energy delivered to the city.

Conserving energy and improving energy efficiency in the built environment is the first step to reducing energy consumption; however, a minimum level of energy is necessary to support a functioning built environment and economy. The intent of this goal is to shift energy consumption that cannot be reduced through energy efficiency away from traditional electricity and natural gas to renewable energy sources. Both

natural gas and electricity can be offset with renewable sources of energy that are profitable, yield cost savings to users, and spur local energy independence.

Through this goal, Sunnyvale will reduce greenhouse gas emissions from traditional electricity production and natural gas by significantly increasing the production of on-site renewable energy or the procurement of energy from additional renewable sources beyond what is currently provided.



EP contribution to total GHG reductions

Sustainable Energy Portfolio Measures

EP-1 Renewable Energy Portfolio

Increase the renewable energy portfolio of electricity delivered to Sunnyvale so that more than 50% of delivered energy comes from renewable sources by 2035.

Action Items:

- EP-1.1. Create or join a community choice aggregation (CCA) program to take control of power generation for city residents and businesses.

EP-1 Key Information

GHG Reductions

2020:	233,400	MTCO ₂ e
2035:	338,420	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Environmental Services

EP-2 Local Renewable Energy

Increase the number of renewable energy installations in and available to the community.

Action Items:

- 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.
- 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.
- EP-2.3. Prevent buildings and additions from shading more than 10% of roofs of other structures.
- EP-2.4. Continue to allow and encourage solar facilities above paved parking areas.
- EP-2.5. Maintain incentives for alternative energy installations in new and existing development, including solar and small-scale wind turbines.
- 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.

EP-2 Key Information

GHG Reductions

2020: 20,980 MTCO₂e

2035: 24,670 MTCO₂e

Co-Benefits



Implementation Time Frame

Mid-Term

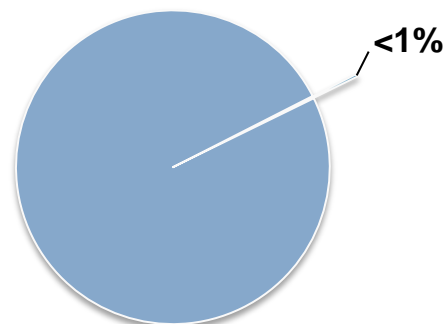
Responsible Department

Community Development

Decrease Water Consumption (WC)

Goal: Reduce water-related greenhouse gas emissions through reclamation, conservation, and improvements to the water and wastewater processes.

Water consumption requires energy to pump, treat, distribute, collect, and discharge water as it is used by the community which results in greenhouse gas emissions. Greenhouse gas emissions also occur as a direct process from wastewater treatment. Conservation and more efficient use of water are both important strategies to reducing GHG emissions from water use and adapting to reduced water availability that may occur due to a changing climate.



WC contribution to total GHG reductions

This goal identifies opportunities to reduce energy-intensive water consumption from both new construction projects and existing development. Through the implementation of water efficiency measures and increased use of recycled water, the need to procure additional water sources in the future will be reduced.

Decrease Water Consumption Measures

WC-1 Water Sources and Efficiency

Decrease the amount of energy needed to filter, transport, and treat water used within Sunnyvale.

Action Items:

- WC-1.1. Prepare a feasibility study to expand the City's current recycled water program citywide and improve the quality of recycled water to expand potential uses to industrial facilities or other applications.
- WC-1.2. Promote "purple pipe" (reclaimed water) infrastructure in new construction or major renovation in preparation for a growing, usable network.
- WC-1.3. Create a purple pipe network for citywide use of recycled water for irrigation and other outdoor purposes.
- WC-1.4. Create flexible provisions and encourage residents and businesses to collect rainwater to use for irrigation purposes.

WC-1 Key Information

GHG Reductions

2020: 230 MTCO₂e

2035: 530 MTCO₂e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Departments

Environmental Services &
Public Works

WC-2 Water Conservation

Reduce indoor and outdoor potable water use in residences, businesses, and industry.

Action Items:

- WC-2.1. Require new development to reduce potable indoor water consumption by 30% (Tier 1 CALGreen) and outdoor landscaping water use by 40%.
- WC-2.2. Revise development standards to ensure the use of greywater, recycled water, and rainwater catchment systems is allowed in all zones.
- WC-2.3. Require new open space and street trees to be drought-tolerant.
- WC-2.4. Implement the City's Urban Water Management Plan to facilitate a 20% reduction in per capita water use by 2020.

WC-2 Key Information

GHG Reductions

2020:	750	MTCO ₂ e
2035:	990	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Community Development
& Public Works

Water Conservation in Action

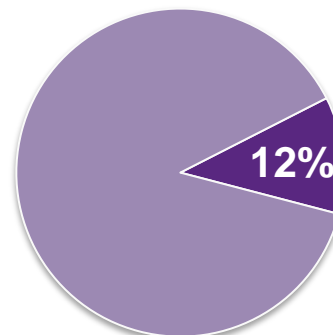
The Santa Clara Valley Water District (SCVWD) offers numerous rebates to residents and businesses in Santa Clara County. Through the water district's Landscape Rebate Program, Lockheed Martin converted a total of 24,532 square feet of irrigated turf to qualifying low-water-using landscape and overhead spray irrigation to drip irrigation at two of its Bay Area campuses. The company also upgraded 31 irrigation controllers to weather-based irrigation controllers. These changes will save an estimated 2.7 million gallons of water a year.

Lockheed Martin also participated in SCVWD's High-Efficiency Toilet Program, which provides the toilets and installation free of charge, allowing the company to replace 325 toilets and 180 urinal flush valves at no cost. The water district also provided 55 faucet aerators; the company then purchased and installed an additional 445 aerators. The total estimated amount of water conserved is nearly 8 million gallons per year, with an estimated savings of \$64,000 per year in ongoing water and sewer costs.

Reduce Landfilled Waste (LW)

Goal: Decrease the amount of waste sent to landfill through increased recycling, composting, and materials management.

In 2008, the City Council adopted a Zero Waste Policy and directed staff to prepare a long-range plan to achieve zero waste in Sunnyvale. The policies in this Climate Action Plan related to waste build upon the City's 2010 waste characterization study by identifying opportunities to decrease waste sent to local or regional landfills through reduction in materials at the source and in day-to-day activities, an increase in recycling, and re-using as appropriate to move toward a Zero Waste community.



LW contribution to total GHG reductions

Both the consumption and disposal of resources require energy and emit greenhouse gases. As waste is sent to the landfill, it decomposes and emits methane gas. By providing additional opportunities to reduce waste generated and recycle or compost waste that cannot be eliminated, waste disposal trends within the community can be reduced. This decreased waste will in turn reduce GHG emissions associated with waste disposal.

Reduce Landfilled Waste Measures

LW-1 Materials Management

Reduce the availability or use of common materials that are not recyclable or that are cost-ineffective to recycle.

Action Items:

- LW-1.1. Reduce the use of plastic bags at grocery stores and convenience stores in the community through incentives or requirements.
- LW-1.2. Ban the sale or dispersal of disposable, single-use plastic water bottles at public events permitted by the City.
- LW-1.3. Ban the use of expanded polystyrene (EPS) take-out containers at restaurants and fast-food facilities.

LW-1 Key Information

GHG Reductions

2020: Supportive Measure
2035: Supportive Measure

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Department

Community Development
& Environmental Services

LW-2 Recycling and Composting

Increase the amount of waste recycled and composted by 1% per year according to the City's Zero Waste Strategic Plan.

Action Items:

- LW-2.1. Require multi-family homes to participate in the City's Multi-family Recycling Program.
- 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.

LW-2 Key Information

GHG Reductions

2020: 53,960 MTCO₂e
2035: 96,190 MTCO₂e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Public Works &
Environmental Services

Sunnyvale's Zero Waste Goal

In 2008, the Sunnyvale City Council adopted a Zero Waste Policy and directed staff to prepare a long-range Zero Waste Strategic Plan. To achieve zero waste, the first step is to characterize the types of waste that are being disposed and then identify opportunities to reduce, reuse, or recycle that waste.

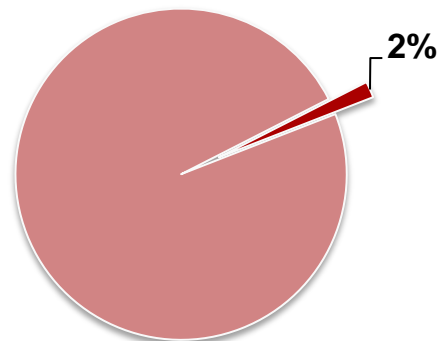
In 2010, the cities of Sunnyvale and Mountain View completed a waste characterization study to provide a detailed look at what types of waste the communities throw away at the Sunnyvale Materials and Recovery Transfer (SMaRt) Station. By determining the types of waste that are currently disposed of at the SMaRt facility, the cities can identify additional opportunities for recycling or collecting food waste and diverting that waste from landfills.

The study found that approximately 76% (53,476 tons) of waste (excluding construction and demolition waste), prior to sorting at the SMaRt facility, fall into the recoverability categories of recyclable paper, other recyclables, and compostable/potentially compostable (Cascadia Consulting Group 2010).

Off-Road Equipment (OR)

Goal: Minimize emissions from off-road lawn and garden and construction equipment.

Construction and lawn and garden equipment combust gasoline and diesel fuel, producing greenhouse gas emissions and releasing other air contaminants such as particulate matter on-site. These two categories of equipment have significant opportunities to be used more efficiently and save users money without impeding business and development opportunities in Sunnyvale.



OR contribution to total GHG reductions

This goal aims to provide alternatives and cost-effective options for using more efficient equipment. Alternatives include electric equipment, alternative fuels, or even solar-powered equipment.

Off-Road Equipment Measures

OR-1 Lawn and Garden Equipment

Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.

Action Items:

- 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.
- 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.
- 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.

OR-1 Key Information

GHG Reductions

2020:	30	MTCO ₂ e
2035:	100	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Department

Community Development

OR-2 Construction Equipment

Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

Action Items:

- OR-2.1. Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five 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.
- OR-2.2. Construction equipment must be maintained per manufacturer's specifications.
- 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 of on-site generators by connecting to grid electricity or utilizing solar-powered equipment.
 - d. Limit heavy-duty equipment idling time to a period of three minutes or less, exceeding CARB regulation minimum requirements of five minutes.

OR-2 Key Information

GHG Reductions

2020:	7,400	MTCO ₂ e
2035:	13,720	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Department

Community Development

Increase and Retain Awareness of Sustainability Issues (CA)

Goal: Community members are knowledgeable about GHG emissions and are all taking actions to reduce them.

Awareness of Sustainability Issues Measures

CA-1 Community Outreach and Involvement

Educate and involve the community regarding actions they can do at home to reduce energy, water, waste, and fuel consumption.

Action Items:

- CA-1.1. Create a structure or partner with other groups of volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.
- CA-1.2. Provide regular communication with schools, businesses, faith groups, community members, and neighborhood groups to increase participation in the city's progress toward sustainability.
- CA-1.3. Develop and encourage a mechanism for neighborhoods to share equipment and resources to improve sustainability.
- 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.
- CA-1.5. Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.
- CA-1.6. Use sustainability initiatives within City operations to educate the community on ways to achieve sustainability by example.
- CA-1.7. Actively promote the use of alternative modes of transportation as safe modes of travel. When applicable, promote viable programs sponsored by 511.org, the BAAQMD, and other recognized agencies on the City's website and publications.
- CA-1.8. Through selected projects and efforts to improve City operations, demonstrate how sustainability efforts are possible and successful.

CA-1 Key Information

GHG Reductions

2020: Supportive Measure

2035: Supportive Measure

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Departments

Community Development,
Sunnyvale Public Library, &
Environmental Services

- 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.
- CA-1.10. Use the City's Sustainability Commission and coordinator as a structure to coordinate with other groups of volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.
- CA-1.11. Actively engage with Sunnyvale businesses to identify areas for GHG reduction and financial savings.

CA-2 School Education and Involvement

Educate local schoolchildren about climate change and ways that they and their families can reduce greenhouse gas emissions.

Action Items:

- CA-2.1. Recommend and advocate for schools to use Bay Area Air Quality Management District curriculum or other programs for local schoolteachers to teach children about climate change, greenhouse gas emissions, and local actions.
- CA-2.2. Continue to provide and improve the bicycle driver education program for elementary, middle, and high school students.

CA-2 Key Information

GHG Reductions

2020: Supportive Measure

2035: Supportive Measure

Co-Benefits



Implementation Time Frame

Near-Term

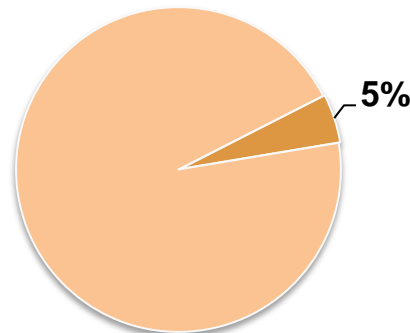
Responsible Departments

Environmental Services
& Public Works

Improve Mobility through Land Use Planning (LUP)

Goal: Utilize land use and planning tools to reduce or eliminate vehicle trips while still completing the activities of our everyday lives.

The distribution of land uses throughout the city shapes community transportation choices. In order to take part in the tasks of daily living, each day people must make choices about transportation that have a direct impact on GHG emissions. Transportation is the second largest contributor of GHGs within the city and one of the most complex sectors to address. Economic considerations, neighborhood boundaries, and other factors can complicate actions to optimize land use and transportation options.



LUP contribution to total GHG reductions

The goal to improve community mobility through land use planning and reduce emissions from transportation requires a multifaceted approach that includes an improved mixture of land uses, improved connectivity and circulation in existing neighborhoods, parking reduction strategies, provision of affordable housing, and an improved jobs/housing balance.

The measures in this section further support the City's implementation of the Sustainable Communities Strategy (SCS), although the GHG reduction impact of the SCS is not quantified separately. The City's designated Priority Development Areas (PDA) are identified in the Santa Clara Valley Transit Authority's (VTA) Core, Corridors, and Station Area Plan. Within Sunnyvale, the areas designated as PDAs include:

- Downtown & Caltrain Station
- East Sunnyvale
- El Camino Real Corridor
- Lawrence Station transit Village
- Tasman Crossing

Land Use Planning Measures

LUP-1 Parking

Reduce the amount of free or unrestricted parking available within the city to promote alternative modes of transportation and avoid unnecessary vehicle circulation.

Action Items:

- 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.
- 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.
- LUP-1.3. Implement parking management tools for residential uses such as decreased or flexible standards, unbundled parking, and shared parking plans.
- LUP-1.4. Establish parking meters throughout downtown Sunnyvale to optimize parking availability and reduce unnecessary vehicle circulation.
- 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.
- LUP-1.6. Designate street parking stalls in the vicinity of key commercial and multi-family residential locations for efficient or alternatively fueled vehicles.

LUP-1 Key Information

GHG Reductions

2020:	4,970	MTCO ₂ e
2035:	5,350	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Department

Public Works

LUP-2 Transit-Oriented, Higher Density, Mixed-Use Development

Facilitate development in designated core and corridor areas that is transit-oriented, higher density, and mixed-use.

Action Items:

- 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-2.2. Continue to identify underutilized areas that can support higher-density housing and mixed-use development.
- LUP-2.3. Facilitate the development of affordable housing near transit.
- 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.
- LUP-2.5. Continue to allow for the development of live/work spaces in commercial zoning districts and mixed-use residential zoning districts.

LUP-2 Key Information**GHG Reductions**

2020: 14,010 MTCO₂e
2035: 15,090 MTCO₂e

Co-Benefits**Implementation Time Frame**

Near-Term

Responsible Department

Community Development

LUP-3 Local Commerce and Food

Increase the amount of locally generated and consumed goods in order to decrease the need for travel and promote healthier communities.

Action Items:

- LUP-3.1. Amend the Zoning Code to allow small-scale, commercial urban farms to operate in residential areas.
- LUP-3.2. Ensure that every residential portion of mixed-use development has opportunities for growing produce locally.
- LUP-3.3. Establish community gardens for public use.
- LUP-3.4. Develop and implement a purchasing policy that requires food and other appropriate

LUP-3 Key Information**GHG Reductions**

2020: Supportive Measure
2035: Supportive Measure

Co-Benefits**Implementation Time Frame**

Long-Term

Responsible Departments

Community Development &
Department of Finance

materials purchased by the City to be purchased from as local a supply as possible.

LUP-4 Jobs/Housing Balance

Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel between residences and places of work.

Action Items:

- LUP-4.1. Support the retention and expansion of local anchor and growth industries.
- 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.

LUP-4 Key Information

GHG Reductions

2020:	900	MTCO ₂ e
2035:	970	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Departments

NOVA Workforce Services & Community Development

LUP-5 Distributed Services

Encourage the wider distribution of commonly used facilities and services in order to reduce the need for or length of vehicular trips to and from places of work and residence.

Action Items:

- LUP-5.1. Encourage the establishment and even distribution of neighborhood-serving facilities such as day-care providers, banking/ATM locations, markets, and drugstores in existing residential, commercial, and industrial areas in order to reduce the need for vehicle trips.
- 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, and shopping.

LUP-5 Key Information

GHG Reductions

2020:	See LUP-4
2035:	See LUP-4

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Department

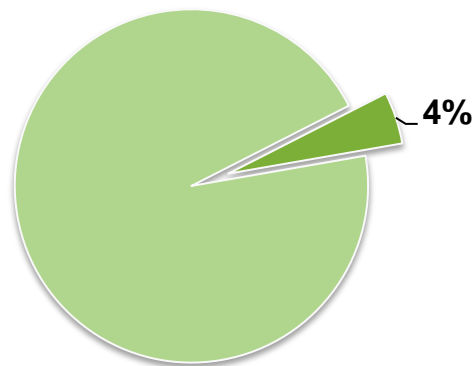
Community Development

Expand Sustainable Circulation and Transportation Options (CTO)

Goal: Modify the transportation infrastructure such that bicycling, walking, and transit are viable options regularly used by all Sunnyvale residents and employees.

Expansion of mode choices within the community, in combination with an expanded diversity of land uses, can replace single-driver trips with low- or zero-emissions modes like walking, biking, transit, and carpooling.

The policies to expand sustainable circulation and transportation options include continued investment of the city's bicycle and pedestrian infrastructure, continued participation in transportation demand management programs for both employees and school-age children, and expanded transit opportunities.



CTO contribution to total GHG reductions

Expand Sustainable Circulation and Transportation Options Measures

CTO-1 Bicycle, Pedestrian, and Transportation Design Elements

Create streets and connections that facilitate bicycling, walking, and transit use throughout the city.

Action Items:

- CTO-1.1. Incorporate the provisions of AB 1358, the California Complete Streets Act of 2008, into roadway design, construction, and maintenance activities.
- CTO-1.2. Implement the street space allocation policy (RTC 8-085, April 28, 2009) in coordination with road reconstruction or resurfacing projects to provide road configurations that accommodate all travel modes.
- 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

CTO-1 Key Information

GHG Reductions

2020:	4,070	MTCO ₂ e
2035:	4,380	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Departments

Public Works & Community Development

employment and shopping centers, schools, parks, and other parcels for ease of pedestrian and cyclist access.

- 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.
- CTO-1.5. Improve bicycle facilities and perceptions of comfort through pavement marking/coloring, physical separation, specialized signs and markings, and other design elements.
- CTO-1.6. Require sidewalks to be a minimum of 6 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 volumes of pedestrian traffic.
- 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 the Valley Transportation Authority, Peninsula Corridor Joint Powers Board, Advisory Committee on Accessibility, and others to establish the best places for these locations.

CTO-2 Bicycle, Pedestrian, and Transportation Travel Operations

Prioritize safe, efficient, and convenient access for non-automotive travel to destinations in and outside of Sunnyvale.

Action Items:

- CTO-2.1. Require public areas and new development to provide bicycle parking consistent with the Valley Transportation Authority Bicycle Technical Guidelines, as amended.
- CTO-2.2. Require secure bicycle parking at public and large private events.
- 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.

CTO-2 Key Information

GHG Reductions

2020: Supportive Measure

2035: Supportive Measure

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Departments

Public Works, Community Development, & Public Safety

- CTO-2.4. Fully fund the City's bicycle and pedestrian improvement plans for completion by 2035.
- 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.
- 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.
- CTO-2.7. Support business efforts to plan and implement a bike-sharing program for major commercial and industrial areas.

CTO-3 Transit

Facilitate the use of public and private transit such as buses, Caltrain, Amtrak, and shuttles to and from Sunnyvale and within the city.

Action Items:

- CTO-3.1. Continue sponsoring projects to provide transit rider amenities at bus stops and rail stations.
- CTO-3.2. Work with the Valley Transportation Authority (VTA) and neighboring jurisdictions to provide transit priority signal timing in order to decrease travel time.
- 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.
- 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.
- 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.

CTO-3 Key Information

GHG Reductions

2020:	5,920	MTCO ₂ e
2035:	19,940	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Near-Term

Responsible Department

Community Development & Public Works

CTO-4 Commute Programs

Reduce single-occupant vehicle trips to major employers (100 employees or more) located in Sunnyvale.

Action Items:

- 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.
- CTO-4.2. Create a TDM program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.
- 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.
- CTO-4.4. Explore programs to encourage large employers to hire Sunnyvale residents.

CTO-4 Key Information

GHG Reductions

2020:	5,420	MTCO ₂ e
2035:	5,840	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Department

Community Development & Public Works

Moffett Park Business & Transportation Association – A TDM Model

The Moffett Park Business & Transportation Association (MPBTA) is a nonprofit organization serving the nearly 14,000 employees and businesses in the 1,200-acre Moffett Park area of Sunnyvale. The MPBTA was formed through a public/private partnership in 2001 as the City and businesses recognized the benefits of pooled resources to implement successful transportation demand management (TDM) programs.

The MPBTA is responsible for organizing an annual employee commute survey, and provides services to employees in Moffett Park including: emergency ride home, shuttle programs to regional transit, free or reduced fare transit passes, educational and informational events on alternative transportation options, and coordination/support for business transportation coordinators at participating companies.

CTO-5 School Commutes

Encourage carpooling, bicycling, walking, and transit access to elementary, middle, and high schools so that the number of car trips is no more than 50% of the number of students at any school.

Action Items:

- CTO-5.1. Support the creation of walking school bus programs in coordination with schools and parent organizations.
- CTO-5.2. Encourage schools to link employees and guardians of students with an online system such as 511.org that provides carpool matching.
- CTO-5.3. Continue to implement a Safe Routes to School program for increased bicycle and pedestrian safety to and from schools.

CTO-5 Key Information**GHG Reductions**

2020: 1,250 MTCO₂e
2035: 2,220 MTCO₂e

Co-Benefits**Implementation Time Frame**

Mid-Term

Responsible Department

Public Works & Public Safety

Safe Routes to School in Santa Clara County

Between 2008 and 2011, the City of Sunnyvale secured more than \$1.8 million in funding for capital improvements that support Safe Routes to School. This funding has been used to construct pedestrian and bicycle improvements on key school routes citywide.

Additionally, the Santa Clara County Department of Public Health received nearly \$1 million, in 2011, to create Safe Routes to School programs at local schools in the county. The program aims to increase safety at local schools primarily through educational programs such as bike rodeos, walking school buses, student safety traffic education, and family fun bike nights.

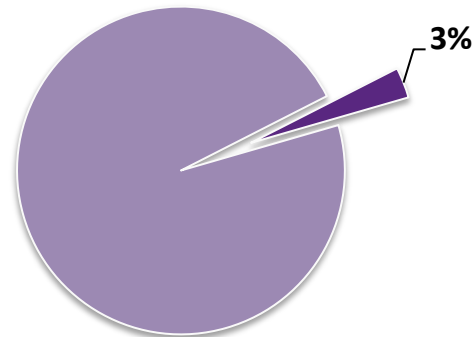
There are numerous benefits to Safe Routes To School programs including:

- Reduced traffic congestion surrounding schools.
- Increased physical activity for students.
- Improved air quality and reduced fuel consumption from idling vehicles.
- Increased community involvement.

Optimize Vehicular Travel (OVT)

Goal: Minimize the environmental impact of vehicular travel.

While more efficient land use planning and increased circulation and transportation options will reduce vehicle trips in Sunnyvale, they cannot eliminate all vehicle trips. GHG emissions reductions will rely on increases in vehicle fuel efficiency and expansion of alternative fuel uses in Sunnyvale by providing the necessary infrastructure to support alternative fuel and zero emissions vehicles.



OVT contribution to total GHG reductions

Although the state and federal governments hold the primary responsibility to increase fuel efficiency standards of new vehicles and support the development of cost-competitive alternative fuels, there are several actions the City of Sunnyvale and the community can take to further support and spur the use of more efficient vehicles.

Optimize Vehicular Travel Measures

OVT-1 Clean Alternative Motor Vehicles and Fuels

Promote the use of clean alternative motor vehicles and fuels to reduce emissions from vehicular travel.

Action Items:

- 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.
- 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.
- OVT-1.3. Require sufficient electrical service in the garages/parking facilities of new residential development to support electric vehicle charging.
- OVT-1.4. Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.

OVT-1 Key Information

GHG Reductions

2020:	7,860	MTCO ₂ e
2035:	19,980	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Department

Public Works &
Environmental Services

- OVT-1.5. Collaborate with taxi franchises to use low-emissions vehicles such as hybrids, compressed natural gas vehicles, biodiesel vehicles, or electric vehicles.
- 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.
- OVT-1.7. Facilitate new fueling stations that offer alternative fuels.
- 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.

OVT-2 Car Sharing

Promote the use of car sharing in Sunnyvale in order to establish and maintain at least one viable car-share operation within the city by 2020.

Action Items:

- 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.
- 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.

OVT-2 Key Information

GHG Reductions

2020:	1,810	MTCO ₂ e
2035:	1,950	MTCO ₂ e

Co-Benefits



Implementation Time Frame

Long-Term

Responsible Departments

City Manager & Community Development

OVT-3 Circulation Efficiency

Improve the flow and efficiency of vehicular traffic throughout the city to avoid idling and reduce fuel consumption.

Action Items:

- OVT-3.1. Increase signal coordination as warranted to facilitate traffic flow along arterials and major collectors.
- OVT-3.2. Educate and enforce idling restrictions associated with delivery trucks and school pickups and drop-offs.

OVT-3 Key Information

GHG Reductions

2020: 4,110 MTCO₂e
2035: 4,180 MTCO₂e

Co-Benefits



Implementation Time Frame

Mid-Term

Responsible Departments

Community Development &
Public Works

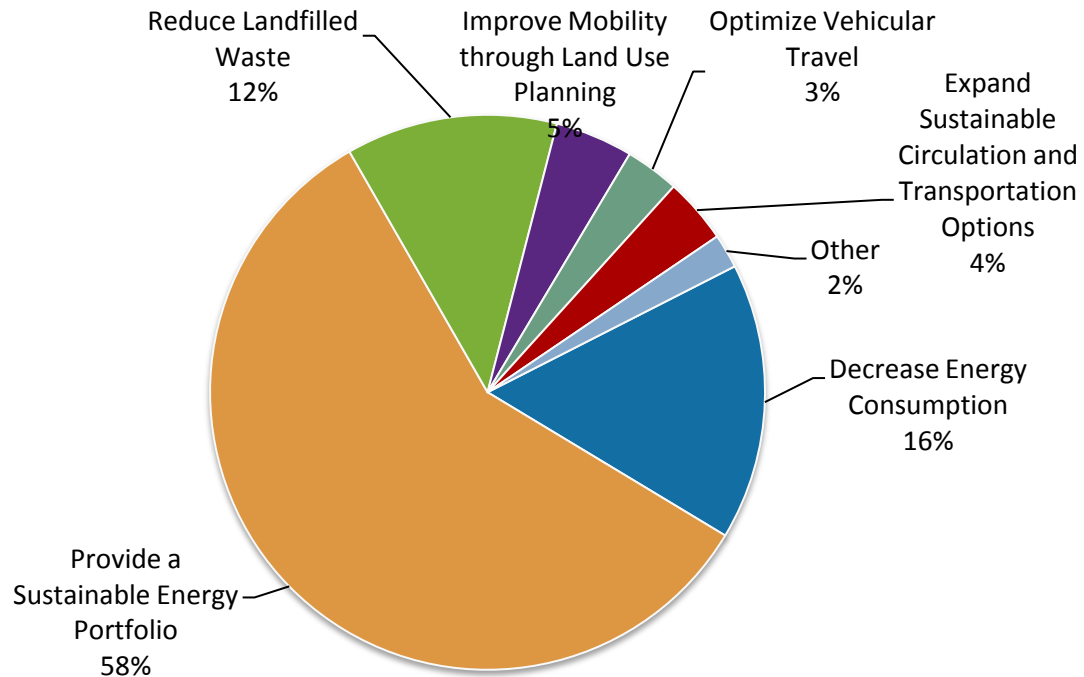
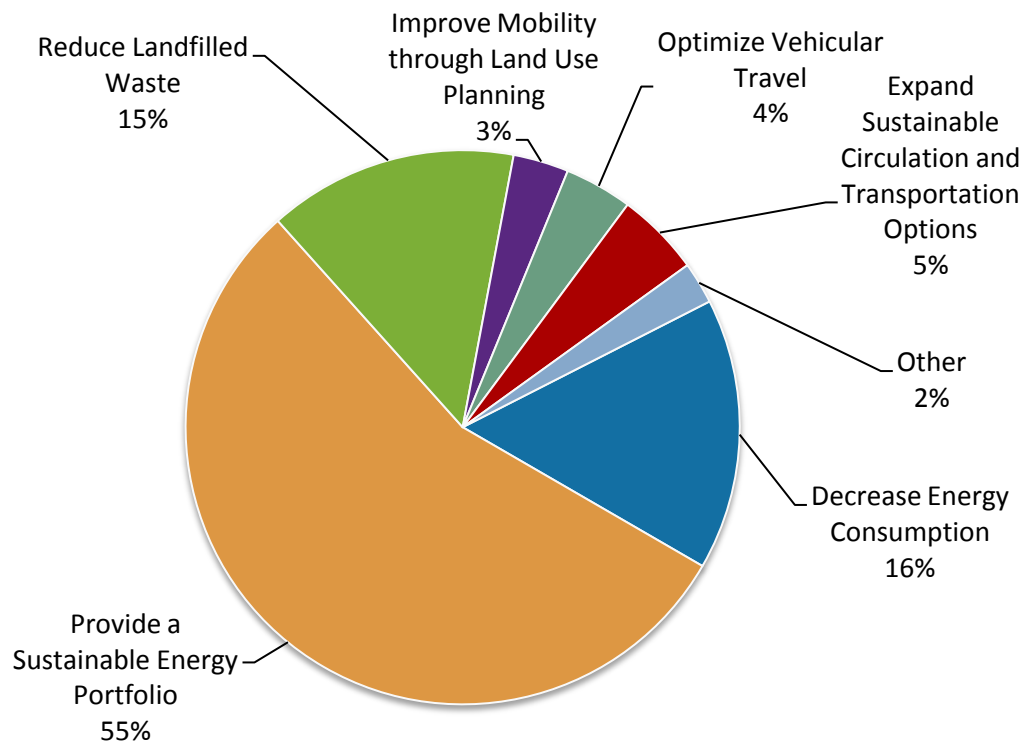
GHG REDUCTION SUMMARY

This Plan identifies a clear path to allow the City to reach the minimum state and BAAQMD requirements. It is important to identify how the City will meet or exceed the minimum GHG reduction target of 15% below baseline levels by 2020 to ensure the City can utilize the Climate Action Plan as a Qualified GHG Reduction Strategy for use in environmental review of projects for new development.

The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs for both new and existing development. The reduction measures also aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, existing actions, state programs, and GHG reduction measures in this Plan will reduce GHG emissions in Sunnyvale in 2020 by 438,050 MTCO₂e (see **Table 8**). **Figure 14** and **Figure 15** demonstrate the GHG reductions achieved by goal for 2020 and 2035, respectively.

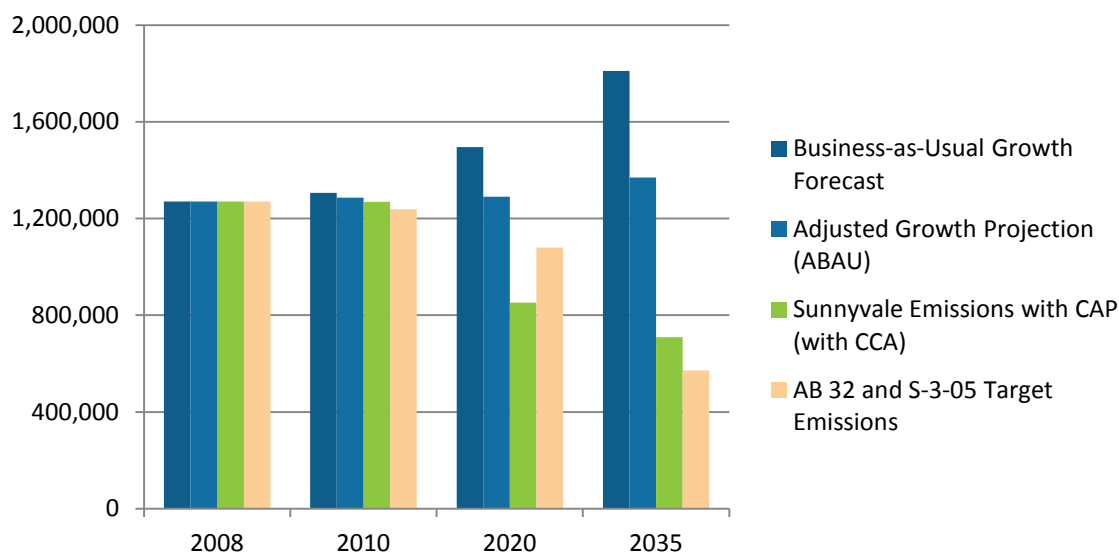
TABLE 8 – 2020 GHG REDUCTIONS BY GOAL

Sector	2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Open Space and Urban Forestry	-310	-780
Decrease Energy Consumption	-70,680	-104,610
Provide a Sustainable Energy Portfolio	-254,380	-363,090
Decrease Water Consumption	-980	-1,520
Reduce Landfilled Waste	-53,960	-96,190
Reduce Off-Road Equipment Emissions	-7,430	-13,820
Increase and Retain Awareness of Sustainability Issues	N/A	N/A
Improve Mobility through Land Use Planning	-19,880	-21,410
Expand Sustainable Circulation and Transportation Options	-16,660	-32,380
Optimize Vehicular Travel	-13,770	-26,110
Total Reductions	-438,050	-659,910

FIGURE 14 – 2020 GHG REDUCTIONS BY GOAL**FIGURE 15 – 2035 GHG REDUCTIONS BY GOAL**

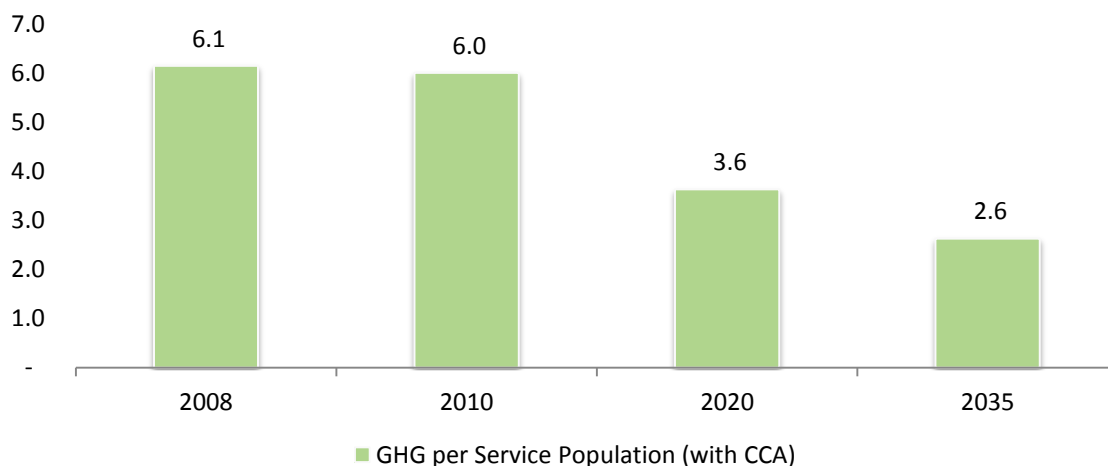
Complete implementation of this Plan will allow the City to achieve the reduction target of 15% below baseline levels by 2020 and will set the City on a trajectory to achieve the state GHG reduction target set by Executive Order S-3-05 of reducing GHG emissions 80% below 1990 levels by 2050. **Figure 16** shows the City's anticipated progress toward achieving the GHG reduction target through the implementation of this Plan.

FIGURE 16 – 2020 GHG REDUCTION TARGET ACHIEVEMENT



Achievement of the target by 2020 will exceed state recommendations and BAAQMD threshold requirements for developing a Qualified GHG Reduction Strategy by approximately 15%. As shown in **Figure 17**, through the implementation of this Plan, the City's GHG emissions will decrease from 6.1 MTCO₂e per person per year in 2008 to 2.6 MTCO₂e per person per year in 2035.

FIGURE 17 – 2008–2035 ANNUAL MTCO₂E PER SERVICE POPULATION



CHAPTER 4

ADAPTATION

Even with significant efforts to mitigate GHG emissions today, future climate projections anticipate that climate change may have significant effects on California's and Sunnyvale's precipitation, temperature, and weather patterns. Sunnyvale is located in Santa Clara County in close proximity to the San Francisco Bay. The potential consequences of climate change for the State of California and the City of Sunnyvale include those described below.



Even with significant efforts to mitigate GHG emissions today, future climate projections anticipate that climate change may have significant effects on California's and Sunnyvale's precipitation, temperature, and weather patterns. Sunnyvale is located in Santa Clara County in close proximity to the San Francisco Bay. The potential consequences of climate change for the State of California and the City of Sunnyvale include those described below. This chapter summarizes the anticipated effects climate change may have on the Northern California region, which may include:

- Increased wildfire risk;
- Negative impacts to wildlife;
- Deteriorating public health;
- Decreased supply of fresh water;
- Increased sea level rise.

CLIMATE CHANGE IMPACTS IN SUNNYVALE

Research suggests that California may experience hotter and drier conditions, reductions in winter snow and increases in winter rains, sea level rise, and an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state. To refrain from action is costly and risky; the California Climate Adaptation Strategy estimates that no action to address the potential impacts of climate change will lead to sector-wide losses of “tens of billions of dollars per year in direct costs” and “expose trillions of dollars of assets to collateral risk.”

Increased Rate of Wildfires

Wildfire risk is based on a combination of factors including precipitation, winds, temperature, and vegetation. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. Even under the “medium” warming scenario predicted by the Intergovernmental Panel on Climate Change, wildfire risk will likely increase by 55% in California (see **Figure 18**). Further, as wildfires increase in frequency and size, they will also increase in intensity.

FIGURE 18 - CALIFORNIA 2085 WILDFIRE RISKS, LOW EMISSIONS SCENARIO



Source: California Energy Commission 2011. Cal-Adapt Local Climate Snapshots.

Negative Impacts on Wildlife

As temperatures rise, species move north in California or to higher elevations. This change in migration disrupts the food chain and prevents some plant species from being pollinated. With vegetation, reduction in soil moisture will result in early dieback of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Several potential hydrological changes associated with global climate change could also specifically influence the ecology of aquatic life in California and have several negative effects on cold-water fish. For example, if a rise in air temperature by just a few degrees Celsius occurs, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp. Many of the potential effects on wildlife are still being studied, but due to an inability to quickly adapt to new climates, the potential for severe species loss is present.

Deteriorating Public Health

Heat waves are expected to have a major impact on public health, as well as decreasing air quality and increasing mosquito breeding and mosquito-borne diseases. Further, climate change is expected to alter the spread and prevalence of disease vectors and lead to a possible decrease in food quality and security. Vector control districts throughout the state are already evaluating how they will address the expected changes to California's climate.

According to a new report from the California Air Resources Board, the warming climate will increase ozone levels in California's major air basins, leading to upwards of 6 to 30 more days per year with ozone concentrations that exceed federal clean air standards. The elderly, young, and vulnerable populations most likely to be impacted by climate change are also those that often lack sufficient resources to adapt. Such vulnerable demographics are likely to need assistance to respond to climate change, which leads to social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks.

Sea Level Rise

Sea level rise is attributed to the increase of average ocean temperatures and the resulting thermal expansion and the melting of ice-sheets contributing to the volume of water held in the oceans. While many effects of climate change will impact Sunnyvale, sea level rise is one specific impact that has been extensively studied and quantified, and its effects mapped. The San Francisco Bay Conservation and Development Commission (BCDC) issued a report on sea level rise in April 2009, which states that sea levels in the Bay Area will rise 16 inches by mid-century and 55 inches by the end of the century. By mid-century, approximately 180,000 acres of the Bay Area could be inundated and 213,000 acres could be flooded by the end of the century, including 93 percent of both the Oakland and the San Francisco airports.

The City of Sunnyvale will be directly impacted by sea level rise, as shown in the BCDC image on the next page. The area vulnerable to 16 inches of sea level rise covers the Sunnyvale Baylands Park, the City's Water Pollution Control Plant, the SMaRT station, and parts of the Lockheed property, see **Figure 19**. In addition, the movement of goods and people in and around the Bay Area that would be disrupted by flooding of ports, airports, highways, and rail lines will be significant for Sunnyvale.

The speed and amount of sea level rise will be determined by the increase in average temperatures and rate of melting of glacial ice. While there is a degree of uncertainty in projections, many original projections have been in reality more conservative than the actual impacts of climate change once they occurred.

FIGURE 19 – SOUTH BAY REGION AT RISK OF 55 INCH SEA LEVEL RISE

Source: Bay Conservation and Development Commission and San Francisco Planning and Urban Research, 2009.

EXISTING ADAPTATION EFFORTS

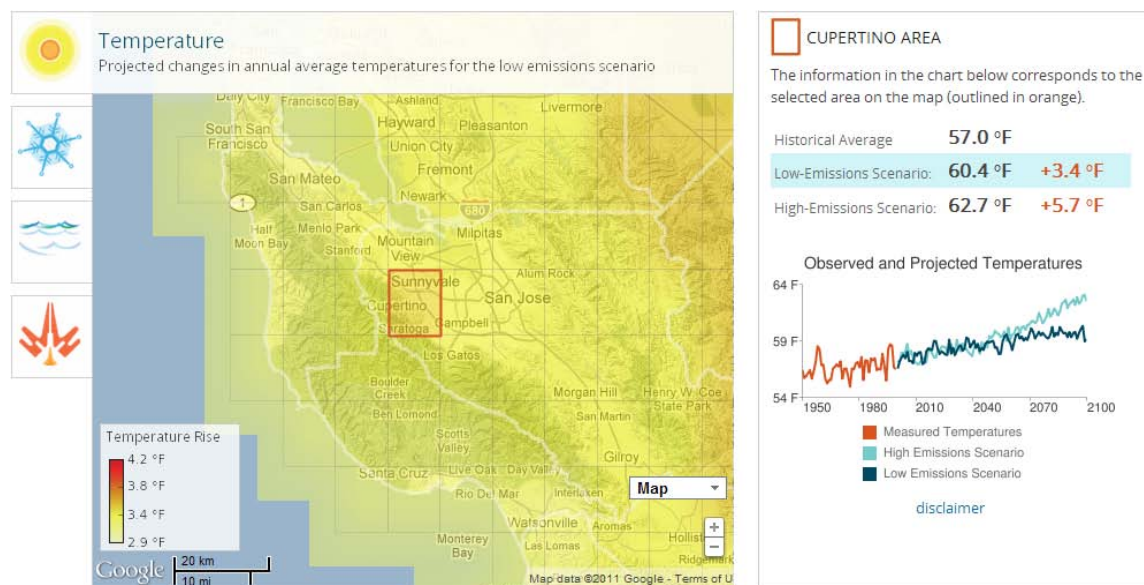
California Climate Adaptation Strategy

In 2009, the California Natural Resources Agency released the California Climate Adaptation Strategy as a guide to both state and local agencies on appropriate strategies to adapt to climate change impacts. The guide includes adaptation strategies for public health, biodiversity, ocean and coastal resources, water management, agriculture, forestry, transportation, and energy infrastructure sectors.

Cal-Adapt

Cal-Adapt is a multifaceted web portal, focusing on climate change effects and adaptation, that presents global climate change data from both historic observations and international computer models in an easy-to-use format. The tool allows users to interactively view historic and future temperature, snowpack, wildfire risk, and rainfall for their neighborhood, city, or all of California in a Google map, as shown in **Figure 20** below. To supplement the maps and projections, nearly 2,000 scholarly journal papers and abstracts are available for study in the portal's publications section, and all of the historic and future data used to create the models is also available.

FIGURE 20 - CAL-ADAPT TEMPERATURE MAP AND PROJECTIONS



Source: California Energy Commission 2011. Cal-Adapt Local Climate Snapshots.

San Francisco Planning & Urban Research, Climate Change Hits Home

San Francisco Planning and Urban Research Association's (SPUR) adaptation report, "Climate Change Hits Home," was published in May 2011. The report recommends 30 adaptation strategies and tools to implement at a local and regional scale to minimize the impact that climate change may have on public safety and health, transportation, ecosystems and bio-diversity, energy, water management, and sea level rise. The report includes a Plan of Action identifying where local governments can act as the primary implementer of the strategies listed in **Table 9**.

San Francisco Bay Conservation and Development Commission (BCDC): BCDC is taking a lead in studying sea level rise and preparing a coordinated strategy. Their efforts include:

- BCDC Bay Plan Amendment: Climate Change Policies - The Commission updated the San Francisco Bay Plan Findings and Policies to include likely impacts of sea level rise in 2010.

- Adaptation Assistance Program (AAP) – The goal of the AAP is to build capacity within local governments to assess climate change issues and to plan for and implement adaptation strategies. The program will facilitate coordination among local governments and provide guidance for local and regional agencies on how to achieve consistency in adaptation policy.
- Regional Sediment Management (RSM) – BCDC is developing a RSM for the San Francisco Bay. The project has received initial funding.
- Rising Tides Design Competition – BCDC held an international design competition in 2009 to gather ideas for sea level rise resiliency.

TABLE 9 - PLAN OF ACTION FOR LOCAL GOVERNMENTS

Responsible Agency	Action
Public Works Department	Reduce urban heat island effect through three principal “no-regrets” strategies: expanding the urban forest, promoting white roofs, and using light-colored pavement materials.
Public Works/Building Departments	Evaluate alternatives and phase in the use of light-colored concrete, paving, and roofing materials on municipal properties.
Building Departments	Cities should begin to require lighter materials or white roofs in private development by amending existing building codes for new buildings and major retrofits.
PG&E Local Governments	Evaluate existing energy-efficiency and demand response programs for their effectiveness at shaving peak electricity demand in more frequent and prolonged hot weather.
Building Departments	Replace or retrofit the building stock over time with resource-efficient, climate-adaptive buildings.
Water Utilities	Develop water-supply scenarios for mid-century and beyond that include assumptions about changes (especially decreases) in precipitation amounts and timing.
Water Utilities	Evaluate alternative water-supply opportunities and demand-management strategies such as water conservation, water recycling and desalination, and prioritize investment in these strategies according to cost, reliability, and environmental benefits.
Water/Stormwater Utilities	Expand investments in “green infrastructure” or low-impact development.
Wastewater Utilities	Evaluate the vulnerability of wastewater collection and treatment systems to severe storms, sea level rise, and storm surge.

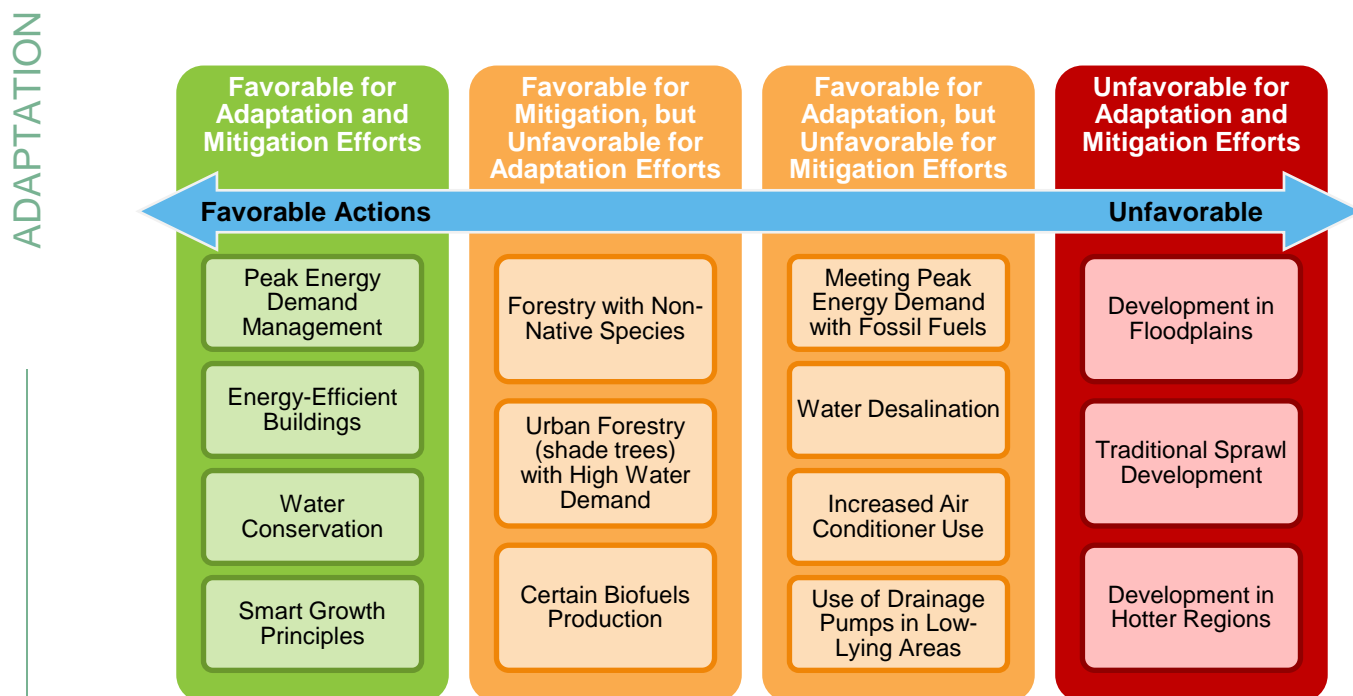
Differentiating Reduction and Adaptation Measures

The City of Sunnyvale is already implementing several of the strategies listed above and has included many of these strategies in this Plan that serve as both adaptation and reduction measures. Adaptation and reduction measures are closely tied, but differ in that adaptation measures address the effects of climate change, whereas reduction measures address the cause. The adaptation measures in this chapter are presented in a different format than the reduction measures, as the adaptation measures have not been quantified for their greenhouse gas (GHG), energy, or economic benefits.

There are two types of adaptation measures: operational changes and increases to adaptive capacity. Operational measures assess climate change vulnerabilities and sensitive populations on a regular basis. They also address climate change adaptation in planning and public safety documents. Adaptive capacity measures are strategies that help prepare for and adjust to the impacts of climate change. Examples include the establishment of cooling centers during heat waves, promotion of energy efficiency and renewable energy to reduce peak load demand, and implementation of low impact development standards to reduce stormwater runoff and increase groundwater recharge. It should be noted that this adaptation chapter is meant to serve as a starting point for the City by including measures that will direct operational changes to identify potential climate change impacts and vulnerabilities but does not include adaptive capacity measures to address specific climate change impacts.

While adaptation measures and reduction measures may differ significantly in their goals, there can be significant common ground between them. For instance, a reduction measure to plant native trees reduces GHG by sequestering carbon and can lower energy consumption for air conditioning. Native tree planting also helps to adapt to climate change impacts by reducing the urban heat island effect and increasing storm water infiltration. **Figure 21** presents a spectrum of complementary and conflicting adaptation and GHG reduction actions.

It should be noted that not all adaptation measures are reduction measures, and vice versa. This Plan incorporates adaptation measures that are not harmful to or in conflict with proposed GHG reduction efforts at this time.

FIGURE 21 - ASSESSING ADAPTATION AND GHG REDUCTION ACTIONS

Source: Bedsworth and Hanak, 2008.

ADAPTATION STRATEGIES

To ensure climate change adaptation is adequately incorporated into future planning efforts, the following measures have been provided to guide City staff involvement in coordinating, preparing for, and educating the public on the potential impacts that climate change may have on the community.

A-1: Regional Coordination

Participate in regional efforts such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC) to analyze and prepare for the impacts of climate change in the Bay Area.

Action Items:

- Action 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.

A-2: Preparedness

Ensure that Sunnyvale is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations such as seniors.

Action Items:

- Action A-2.1. Regularly train and inform the Department of Public Safety Office of Emergency Services (OES) on potential climate change risks and hazards.
- Action A-2.2. Update the City Emergency Plan and Emergency Preparedness Workbook to address climate change impacts.

A-3: Adaptive Planning

Integrate potential climate change impacts into local planning documents and processes.

- Action A-3.1. Analyze and disclose possible impacts of climate change on the project or plan area with an emphasis on sea level rise.
- Action A-3.2. Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.

A-4: Monitoring

Monitor climate change science and policy and regularly inform stakeholders of new information.

- Action A-4.1. Dedicate a page of the City's website to climate change and climate change adaptation.
- Action A-4.2. On a regular basis, assess adaptation efforts of the City, region, and state and identify goals or gaps to be addressed.

CHAPTER 5



IMPLEMENTATION PROGRAM

Reducing GHG emissions 15% below baseline 2008 levels will be a significant task. CAP implementation will require City leadership to execute strategies and report on the progress of implementation. This implementation program outlines a path for the City to monitor progress and summarizes the GHG reductions that will occur through the implementation of this Plan.

IMPLEMENTATION PROGRAM

Reducing GHG emissions 15% below baseline 2008 levels will be a significant task. This implementation program outlines a path for the City to monitor progress and summarizes the GHG reductions that will occur through the implementation of this Plan.

Implementation Information

To ensure the success of this Climate Action Plan, the City will integrate the goals and strategies of this plan into other local and regional plans, programs, and activities. As the City moves forward with the Land Use and Transportation Element update as well as Zoning Code updates, Specific Plans, Housing Element updates, and other planning documents, staff will ensure these documents support and are consistent with the CAP.

CAP implementation will also require City leadership to execute strategies and report on the progress of implementation. The City's Sustainability coordinator will be responsible for coordinating GHG reduction efforts between departments and will designate staff to monitor and report on the progress of the CAP. This Plan identifies the responsible department for each measure and offers time frames and plan-level cost estimates for implementing each strategy. Lastly, successful implementation requires regular monitoring and reporting. Staff should monitor the CAP's implementation progress on an annual basis and report to the City Council on the CAP's progress each year.

Crucial to the implementation of this Plan will be the City's implementation matrix. This matrix contains the GHG reduction, cost, savings, and co-benefit information presented in Chapter 3 for the year 2020, as well as more detail for City staff to effectively integrate these actions into their work plans. Additional information includes:

- **Costs and Savings to the City and Community:** These plan-level cost estimates are provided to allow for comparison between measures and to easily determine whether the savings outweigh the costs. These costs are based on the best available information at the time this Plan was developed and are represented in total annual costs or savings by 2020. For simplicity, these costs and savings are presented in the following ranges provided in Table 10.

TABLE 10 – COSTS AND SAVINGS TO THE COMMUNITY RANGES

Numeric Value (\$)	Range
0	Minimal
1–25,000	Low
25–100,000	Low-Med
100,000–200,000	Medium
200,000–500,000	Medium-High
500,000–1,000,000	High
Over 1 million	Very High

- **Implementation Time Frame:** The phase in which this measure should begin implementation. Time frames include:
 - Near-Term – before 2016
 - Mid-Term – before 2020
 - Long-Term – after 2020
- **Responsible Agency:** City department or division that will take the lead on implementing and reporting process on the selected measure. Other departments and divisions will likely play a major supporting role; however, this department/division is the leader.
- **Applicability:** Designates the type of development to which the measure applies. There are four options:
 - Municipal – applies to municipal operations
 - New Development – applies to new development applications only
 - Existing Development – applies to existing development
 - New & Existing Development – applies to new and existing development.
- **Community Benefits:** An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing greenhouse gas emissions. In this document, the co-benefits are defined as follows:



- **Performance Indicator:** Performance indicators and targets are readily available statistics that signify a reduction in GHG. These indicators allow the City to measure progress and track implementation of each measure.

The City will use the implementation matrix and will develop a corresponding implementation tool to track, monitor, and update the Plan's implementation progress. As the City reports on progress in implementing the CAP, staff will evaluate the effectiveness of each measure to ensure that the anticipated GHG reductions are occurring. In the event that GHG reductions do not occur as expected, the City has the ability to modify and add additional policies to the CAP to ensure the City meets the 2020 reduction target.

Implementation Measures

IMPLEMENTATION MEASURE 1: MONITORING

Annually monitor and report the City's progress toward achieving the reduction target.

Action Items:

- **Action 1.1.** Provide support to City staff to facilitate implementation of measures and actions.
- **Action 1.2.** Prepare an annual progress report for review and consideration by the City Council, Planning Commission, or other applicable advisory bodies.
- **Action 1.3.** Develop and utilize a monitoring and reporting tool to assist with annual reports.
- **Action 1.4.** Identify key staff responsible for annual reporting and monitoring.
- **Action 1.5.** Integrate the results of the annual monitoring and reporting into the community conditions indicator report that is presented annually with the City budget.

IMPLEMENTATION MEASURE 2: UPDATE GHG INVENTORY AND PLAN

Update the baseline greenhouse gas emissions inventory and Climate Action Plan at a minimum of every five years.

Action Items:

- **Action 2.1.** Inventory 2013 GHG emissions no later than 2015.
- **Action 2.2.** Update the Climate Action Plan to incorporate new technology, programs, and policies to reduce GHG emissions.
- **Action 2.3.** Consider updating and amending the Plan, as necessary, should the City find that specific reduction measures are not meeting intended GHG reductions.

IMPLEMENTATION MEASURE 3: COLLABORATIVE PARTNERSHIPS

Continue to develop partnerships that support implementation of the Climate Action Plan.

Action Items:

- **Action 3.1.** Continue formal memberships and participation in local and regional organizations that provide tools and support for energy efficiency, energy conservation, greenhouse gas emissions reductions, adaptation, education, and implementation of this Plan.

IMPLEMENTATION MEASURE 4: FUNDING SOURCES

Secure necessary funding to implement the Climate Action Plan.

Action Items:

- **Action 4.1.** Identify potential funding sources for reduction measures as part of annual reporting.
- **Action 4.2.** Ensure implementation through the inclusion of emissions reduction and adaptation measures in department budgets, the capital improvement program, and other plans as appropriate.
- **Action 4.3.** Pursue local, regional, state, and federal grants to assist with potential costs to the City and the community and support successful implementation of the CAP.

Monitoring and Updating This Plan

The City will use the implementation matrix, as well as the implementation and monitoring tool, to track, monitor, and update the Climate Action Plan. As the City reports on progress in implementing the CAP, staff will evaluate the effectiveness of each measure to ensure that the anticipated GHG reductions are occurring. In the event that GHG reductions do not occur as expected, the City will be able to modify and add further policies to the CAP to ensure the City meets the 2020 reduction target.

Implementation Matrix

This matrix, **Table 11**, contains the GHG reduction, performance target, implementation time frame, and the responsible and supporting agencies information presented in **Chapter 3** for the year 2020, as well as more detail for City staff to effectively integrate these actions into budgets, capital improvement programs, and programs.

TABLE 11 – CAP IMPLEMENTATION MATRIX

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
Open Space and Urban Forestry (OS) Provide local open space resources that support natural processes and provide rest, relaxation, and recreation opportunities.															
OS-1	Open Space	Maintain and increase the amount of open space in Sunnyvale consistent with the Parks of the Future Plan and the Open Space Element of the General Plan.	-20	-50	Very High	Minimal	Minimal	Near-Term	Community Services & Community Development	New & Existing Development	Voluntary	Improves Public Health	Provides Educational Opportunities	Improves Mobility	New acres of parkland
OS-2	Outdoor Meeting Space	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.	Supportive Measure	Supportive Measure	Minimal	Minimal	Minimal	Mid-Term	Community Development	New Development	Voluntary	Improves Public Health	Provides Educational Opportunities	–	n/a
OS-3	Urban Forestry	Increase the number of shade trees planted in the community, and protect the existing tree stock.	-290	-730	Medium	Low	Medium	Mid-Term	Public Works	New & Existing Development	Mandatory for New, Voluntary for Existing	Improves Public Health	Reduces Energy Demand	Adaptation Measure	Number of new street trees planted
Decrease Energy Consumption (EC) Improve energy efficiency and conservation in the community and City operations.															
EC-1	Lighting Efficiency	Increase the use of efficient indoor and outdoor lighting technologies.	-220	-210	Very High	Minimal	Minimal	Mid-Term	Public Works & Community Development	Municipal	Voluntary	Reduces Energy Demand	–	–	Percentage of City streetlights replaced with LED
EC-2	New Construction and Remodels	Require green building practices in new residential and commercial development and remodels.	-4,440	-10,570	Low	High	High	Near-Term	Community Development	New Development	Mandatory	Reduces Energy Demand	Supports Local Economy	Reduces Water Consumption	Compliance with Green Building Ordinance and CALGreen
EC-3	Residential Energy Efficiency	Reduce residential energy use, with emphasis on existing homes built before 1990.	-7,350	-20,060	Medium-High	Very High	Very High	Mid-Term	Community Development	Existing Development	Mandatory	Reduces Energy Demand	Supports Local Economy	Provides Community Savings	Percentage of homes and businesses that response to energy audits and percentage that participate in a

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
															PACE program New units receiving building permits
EC-4	Commercial Energy Efficiency	Establish a regulatory and incentive-based structure that facilitates commercial and industrial energy efficiency and conservation.	-47,900	-60,520	High	Very High	Very High	Near-Term	Community Development	New & Existing Development	Mandatory	Reduces Energy Demand	Adaptation Measure	Provides Community Savings	Percentage of commercial properties retrofitted upon sale and percentage of businesses that participate in PACE
EC-5	Smart Grid	Increase awareness and utilization of real-time energy consumption data and pricing available through PG&E's Smart Meter program.	-10,300	-12,050	Low	Low-Med	Very High	Mid-Term	Community Development	New & Existing Development	Mandatory for New, Voluntary for Existing	Reduces Energy Demand	Provides Community Savings	–	Percentage of new and existing homes and businesses that participate in monitoring program
EC-6	"Cool" Roofs and Pavements	Reduce the amount of dark, non-reflective roofing and paving material in order to mitigate the urban heat island effect and reduce energy associated with heating and cooling.	-470	-1,200	Low	Minimal	Medium-High	Long-Term	Community Development & Public Works	New Development	Mandatory	Reduces Energy Demand	Improves Public Health	Provides Community Savings	All new parking lots, crosswalks, and sidewalks are made of high albedo content New office, industrial, retail, and services floor area permitted (SunGIS)
Provide a Sustainable Energy Portfolio (EP) Increase the amount of renewable energy produced in the city and facilitate a higher renewable mix for energy delivered to the city.															
EP-1	Renewable Energy Portfolio	Increase the renewable energy portfolio of electricity delivered to Sunnyvale so that more than 50% of delivered energy comes from renewable sources by 2035.	-233,400	-338,420	Low-Med	Minimal	Minimal	Near-Term	Environmental Services	New & Existing Development	Voluntary	Adaptation Measure	–	–	Percentage of "light" and "dark green" participants and renewable mix for "light" and "dark green"

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
EP-2	Local Renewable Energy	Increase the number of renewable energy installations in and available to the community.	-20,980	-24,670	Low	Very High	Very High	Mid-Term	Community Development	New & Existing Development	Voluntary	Reduces Energy Demand	Provides Community Savings	Adaptation Measure	Residential and nonresidential participation rates Permitted new square footage of commercial offices, retail and service space, and industry New residential units receiving building permits (SunGIS)
Decrease Water Consumption (WC) Reduce water-related greenhouse gas emissions through reclamation, conservation, and improvements to the water and wastewater processes.															
WC-1	Water Sources and Efficiency	Decrease the amount of energy needed to filter, transport, and treat water used within Sunnyvale.	-230	-530	Very High	Minimal	Low-Med	Long-Term	Environmental Services & Public Works	New & Existing Development	Mandatory for New, Voluntary for Existing	Reduces Energy Demand	Reduces Water Consumption	Adaptation Measure	Annual reclaimed water use Average daily water consumption per capita
WC-2	Water Conservation	Reduce indoor and outdoor potable water use in residences, businesses, and industry.	-750	-990	Low	Medium	Very High	Near-Term	Community Development & Public Works	New Development	Mandatory	Adaptation Measure	Reduces Water Consumption	–	Gallons per capita per day (gpcpd) water consumption Square footage of permitted new construction (SunGIS)
Reduce Landfilled Waste (LW) Decrease the amount of waste sent to landfill through increased recycling, composting, and materials management.															
LW-1	Materials Management	Reduce the availability or use of common materials that are not recyclable or that are cost ineffective to recycle.	Supportive Measure	Supportive Measure	Low-Med	Minimal	Minimal	Long-Term	Community Development & Environmental Services	New & Existing Development	Mandatory	Adaptation Measure	–	–	n/a
LW-2	Recycling and Composting	Increase the amount of waste recycled and composted by 1% per year according to the City's Zero Waste Strategic Plan.	-53,960	-96,190	Medium	Minimal	Minimal	Near-Term	Public Works & Environmental Services	New & Existing Development	Mandatory	Provides Community Savings	Reduces Energy Demand	–	Per capita disposal rates or overall diversion rate

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
Off-Road Equipment (OR) Minimize emissions from off-road lawn and garden and construction equipment.															
OR-1	Lawn and Garden Equipment	Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.	-30	-100	Low	Medium	Minimal	Long-Term	Community Development	New & Existing Development	Voluntary	Provides Community Savings	Improves Public Health	–	Percentage of lawnmowers and leaf blowers exchanged
OR-2	Construction Equipment	Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	-7,400	-13,720	Minimal	Minimal	Minimal	Long-Term	Community Development	New Development	Mandatory	Improves Public Health	–	–	Percentage of equipment that is fuel efficient and/or alternatively fueled Idling restrictions
Increase and Retain Awareness of Sustainability Issues (CA) Community members are knowledgeable about GHG Emissions and are all taking actions to reduce them.															
CA-1	Community Outreach and Involvement	Educate and involve the community regarding actions they can do at home to reduce energy, water, waste, and fuel consumption.	Supportive Measure	Supportive Measure	Medium-High	Minimal	Minimal	Near-Term	Community Development, Sunnyvale Public Library, & Environmental Services	Other	Voluntary	Provides Community Savings	Provides Educational Opportunities	–	Number of community events related to sustainability
CA-2	School Education and Involvement	Educate local schoolchildren about climate change and ways that they and their families can reduce greenhouse gas emissions.	Supportive Measure	Supportive Measure	Medium	Minimal	Minimal	Near-Term	Environmental Services & Public Works	Other	Voluntary	Provides Educational Opportunities	–	–	Number of school outreach events conducted
Improve Mobility Through Land Use Planning (LUP) Utilize land use and planning tools to reduce or eliminate vehicle trips while still completing the activities of our everyday lives.															
LUP-1	Parking	Reduce the amount of free or unrestricted parking available within the city to promote alternative modes of transportation and avoid unnecessary vehicle circulation.	-4,970	-5,350	Medium	Unknown	Unknown	Mid-Term	Public Works	New Development	Mandatory	Improves Mobility	Reduces Energy Demand	–	Reduction in parking provision compared to a parking generation rate \$10 monthly parking cost

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
LUP-2	Transit-Oriented, Higher Density, Mixed-Use Development	Facilitate development in designated core and corridor areas that is transit oriented, higher density, and mixed use.	-14,010	-15,090	Unknown	Minimal	Minimal	Near-Term	Community Development	New Development	Mandatory	Improves Public Health	Improves Mobility	Supports Local Economy	Percentage of new housing units are deed-restricted below market rate
LUP-3	Local Commerce and Food	Increase the amount of locally generated and consumed goods in order to decrease the need for travel and promote healthier communities.	Supportive Measure	Supportive Measure	Low	Minimal	Minimal	Long-Term	Community Development & Department of Finance	New & Existing Development	Voluntary	Improves Public Health	Provides Community Savings	–	N/A
LUP-4	Jobs/Housing Balance	Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel between residences and places of work.	-900	-970	Unknown	Unknown	High	Mid-Term	NOVA Workforce Services & Community Development	New & Existing Development	Voluntary	Supports Local Economy	Provides Community Savings	–	Jobs-to-housing ratio
LUP-5	Distributed Services	Encourage the wider distribution of commonly used facilities and services in order to reduce the need for or length of vehicular trips to and from places of work and residence.	See LUP-4	See LUP-4	Low	Unknown	Unknown	Mid-Term	Community Development	New & Existing Development	Voluntary	Improves Mobility	Supports Local Economy	–	New residential development permits issued Additional commercial and industrial square footage
Expand Sustainable Circulation and Transportation Options (CTO) Modify the transportation infrastructure such that bicycling, walking, and transit are viable options regularly used by all Sunnyvale residents and employees.															
CTO-1	Bicycle, Pedestrian, and Transportation Design Elements	Create streets and connections that facilitate bicycling, walking, and transit use throughout the city.	-4,070	-4,380	Very High	Low	Very High	Near-Term	Public Works & Community Development	New & Existing Development	Voluntary	Improves Mobility	–	–	Miles of bike lanes and sidewalks installed
CTO-2	Bicycle, Pedestrian, and Transportation Travel Operations	Prioritize safe, efficient, and convenient access for non-automotive travel to destinations in and outside of Sunnyvale.	Supportive Measure	Supportive Measure	Very High	Minimal	Low-Med	Mid-Term	Public Works, Community Development, & Public Safety	New & Existing Development	Voluntary	Improves Mobility	–	–	Number of bicycle support facilities Miles of bikeways

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
CTO-3	Transit	Facilitate the use of public and private transit such as buses, Caltrain, Amtrak, and shuttles to and from Sunnyvale and within the city.	-5,920	-19,940	Low	Low	Low	Near-Term	Community Development & Public Works	New & Existing Development	Mandatory	Improves Mobility	--	-	VTA transit ridership in Sunnyvale
CTO-4	Commute Programs	Reduce single-occupant vehicle trips to major employers (100 employees or more) located in Sunnyvale.	-5,420	-5,840	Low-Med	Minimal	Medium	Mid-Term	Community Development & Public Works	New & Existing Development	Mandatory for New, Voluntary for Existing	Provides Community Savings	-	-	Participation in commute trip reduction programs
CTO-5	School Commutes	Encourage carpooling, bicycling, walking, and transit access to elementary, middle, and high schools so that the number of car trips is no more than 50% of the number of students at any school.	-1,250	-2,220	High	Minimal	Low-Med	Mid-Term	Community Development	Other	Voluntary	Improves Public Health	Provides Educational Opportunities	Improves Mobility	Commute to school mode share
Optimize Vehicular Travel (OVT) Minimize the environmental impact of vehicular travel.															
OVT-1	Clean Alternative Motor Vehicles and Fuels	Promote the use of clean alternative motor vehicles and fuels to reduce emissions from vehicular travel.	-7,860	-19,980	High	Minimal	Very High	Long-Term	Public Works & Environmental Services	New & Existing Development	Voluntary	Improves Public Health	-	-	Number of NEVs in operation and number of parking spaces designated for EV or clean fuel vehicles Square footage of new commercial and industrial development
OVT-2	Car Sharing	Promote the use of car sharing in Sunnyvale in order to establish and maintain at least one viable car-share operation within the city by 2020.	-1,810	-1,950	Low	Low	Medium	Long-Term	City Manager & Community Development	New & Existing Development	Voluntary	Improves Mobility	-	-	Number of car-share operations or vehicles

#	Policy Topic	Reduction Measure	GHG Reductions (MTCO ₂ e/year)		City Costs	Community		Time Frame	Responsible Agencies	Applicability	Compliance	Community Benefits			Performance Metrics
			2020	2035		Costs	Savings								
OVT-3	Circulation Efficiency	Improve the flow and efficiency of vehicular traffic throughout the city to avoid idling and reduce fuel consumption.	-4,110	-4,180	High	Minimal	High	Mid-Term	Community Development & Public Works	New & Existing Development	Mandatory	Improves Mobility	Improves Public Health	–	Reduction in vehicle idling times Vehicle miles traveled on weekdays
Adaptation (A) Plan and prepare the City of Sunnyvale for the potential impacts of climate change.															
A-1	Regional Coordination	Participate in regional efforts such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC) to analyze and prepare for the impacts of climate change in the Bay Area.	N/A	N/A	Minimal	Minimal	Minimal	Near-Term	City Manager	Other	Voluntary	Adaptation Measure	Provides Educational Opportunities	–	Staff reports to Council every year on adaptation efforts
A-2	Preparedness	Ensure that Sunnyvale is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations such as seniors.	N/A	N/A	Low	Unknown	Unknown	Near-Term	Community Services	Other	Voluntary	Adaptation Measure	Provides Educational Opportunities	–	One training session every two years
A-3	Adaptive Planning	Integrate potential climate change impacts into local planning documents and processes.	N/A	N/A	Unknown	Unknown	Unknown	Near-Term	Community Development	New Development	Voluntary	Adaptation Measure	Provides Educational Opportunities	–	N/A
A-4	Monitoring	Monitor climate change science and policy and regularly inform stakeholders of new information.	N/A	N/A	Low	Unknown	Unknown	Near-Term	Community Development	Municipal	Voluntary	Adaptation Measure	Provides Educational Opportunities	–	N/A

CHAPTER 6

GLOSSARY

The Glossary defines key terms used throughout the Climate Action Plan.



GLOSSARY

Air Basin: A land area with generally similar meteorological and geographic conditions throughout. To the extent possible, air basin boundaries are defined by the California Air Resources Board (CARB) along political boundary lines and include both the source and receptor areas. California is currently divided into 15 air basins.

Air Pollutants: Amounts of foreign and/or natural substances occurring in the atmosphere that may result in adverse effects to humans, animals, vegetation, and/or materials.

American Recovery and Reinvestment Act (ARRA): Commonly referred to as the Stimulus Plan or Recovery Act, ARRA is an economic stimulus package enacted by the federal government in 2009. The intent of the stimulus is to create jobs and promote investment and consumer spending during the economic recession.

Assembly Bill (AB) 32, California Global Warming Solutions Act of 2006: Establishes a comprehensive program of regulatory and market mechanisms to achieve real, quantifiable, cost-effective reductions of greenhouse gases (GHG) for the State of California. Designates CARB as the responsible agency for monitoring and reducing statewide GHG emissions to reduce emissions to 1990 levels by 2020.

Assembly Bill (AB) 811: Authorizes all cities and counties in California to designate areas within which willing property owners may finance the installation of distributed renewable energy generation, as well as energy efficiency improvements through low-interest loans. These financing programs are commonly referred to as Property Assessed Clean Energy, or PACE programs.

Assembly Bill (AB) 939: Establishes a goal of achieving a statewide waste diversion rate of 75% and requires cities and counties to divert a minimum of 75% of their waste stream for reuse or recycling.

Association of Bay Area Governments (ABAG): The regional planning agency for the 9 counties and 101 incorporated cities in the San Francisco Bay Area.

Business-As-Usual (BAU): A business-as-usual projection forecasts greenhouse gas emissions without regulatory or technical intervention to reduce GHG emissions.

California Climate Adaptation Strategy (CAS): Summarizes the best-known science on climate change impacts to California and provides recommendations on how to manage the risks.

California Environmental Quality Act (CEQA): A state law requiring state and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an environmental impact report (EIR) must be prepared and certified as to its adequacy before action can be taken on the proposed project. General plans require the preparation of a program EIR.

California Green Building Standards Code (CALGreen): The 2010 California Green Building Standards Code, commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Buildings Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply with mandatory measures under the topics of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics.

California Solar Initiative (CSI): Allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state's investor-owned utilities: Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE).

Carbon Dioxide (CO₂): A colorless, odorless gas that occurs naturally in the earth's atmosphere. Significant quantities are also emitted into the air by fossil fuel combustion. (See also the California Climate Change Glossary.)

Carbon Dioxide Equivalent (CO₂e): A metric measure used to compare the emissions from various greenhouse gases based on their global warming potential (GWP). The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP.

Carbon Sequestration: The process through which agricultural and forestry practices remove carbon dioxide from the atmosphere. The term "carbon sinks" is also used to describe agricultural and forestry lands that absorb carbon dioxide.

Carl Moyer Program: Created to reduce air pollution emissions from older heavy-duty diesel engines. The program offers incentives to on-road and off-road heavy-duty vehicle owners to retrofit the engine or replace the entire vehicle with a cleaner or alternative-fuel engine.

Car Sharing: A type of car rental where people rent cars for short periods of time, often by the hour.

Clean Air Act: Requires the EPA to set National Ambient Air Quality Standards for six common air pollutants, known as "criteria pollutants," that are found all over the United States: particle pollution (particulate matter), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. The EPA regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels.

Clean Car Fuel Standards (AB 1493, Pavley): Signed into law in 2002 and commonly referred to as Pavley standards. Require carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs.

Climate Action Plan (CAP): Strategic plans that establish policies and programs for reducing (or mitigating) a community's greenhouse gas emissions and adapting to the impacts of climate change. This plan serves the function of a CAP.

Climate Change (also referred to as global climate change): The term "climate change" is sometimes used to refer to all forms of climatic inconsistency, but because the earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term "global warming"; scientists, however, tend to use the term in the wider sense to also include natural changes in climate.

Climate Change Adaptation: The adjustment in natural or human systems to respond to actual or expected climate changes to minimize harm or take advantage of beneficial opportunities.

Climate Change Mitigation: A technical or behavioral intervention to reduce the sources of greenhouse gas emissions in order to reduce the potential effects of climate change.

Climate Zone: The California Energy Commission has classified the distinct climates throughout California by climate zone to recognize the variability in energy use based on local weather patterns. The Energy Commission uses these climate zones to determine energy budgets for new and renovated buildings and prescriptive packages for each climate zone to ensure that they meet the State's Title 24 energy efficiency standards.

Co-Benefits: An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing greenhouse gas emissions. In this document, the co-benefits are defined as follows:



Cool Roof: A roof with high solar reflectivity is considered a cool roof. Cool roofs reduce heat transfer into the indoors and can reduce indoor energy demand.

Community Choice Aggregation: Community Choice Aggregation or CCA is a program that allows cities or counties to purchase or generate electricity for a community's residents or businesses. Through the CCA program, the investor owned utility, such as PG&E continues to deliver the electricity through the transmission and distribution system. Many jurisdictions implementing CCA programs have set goals to significantly increase the amount of renewable energy provided to customers.

Complete Streets: Complete Streets policies ensure that transportation planners and engineers consistently design and operate the entire roadway with all potential users in mind. This includes bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities. In 2007, the State of California adopted AB 1358, which directs the legislative body of a city or county, upon revision of the circulation element of its general plan, to identify how the jurisdiction will provide for the routine accommodation of all users

Compressed Natural Gas (CNG): A fossil-fuel substitute for gasoline, diesel, or propane that can be used in passenger and heavy-duty vehicles.

Conservation: Planned management of a natural resource to prevent exploitation, destruction, or neglect.

Construction and Demolition Waste (C&D): C&D materials consist of the waste generated during the construction, demolition, or renovation of buildings, roads, and other construction projects. C&D materials may include heavy, bulky materials such as concrete, glass, wood, and metal, among other materials.

Distributed Energy Resources (DER): Small, modular, energy generation and storage technologies that provide electric capacity or energy located where it's needed. DERs typically produce less than 10 megawatts (MW) of power and include wind turbines, photovoltaics (PV), fuel cells, microturbines, reciprocating engines, combustion turbines, cogeneration, and energy storage systems. DER systems may be either connected to the local electric power grid or isolated from the grid in stand-alone applications.

Easement, Conservation: A tool for acquiring open space with less than full-fee purchase, whereby a public agency buys only certain specific rights from the landowner. These may be positive rights (providing the public with the opportunity to hunt, fish, hike, or ride over the land) or they may be restrictive rights (limiting the uses to which the landowner may devote the land in the future).

Emission Standard: The maximum amount of pollutant legally permitted to be discharged from a single source, either mobile or stationary.

Energy Conservation: Reducing energy waste, such as turning off lights, heating, and motors when not needed.

Energy Efficiency: Doing the same or more work with less energy, such as replacing incandescent light bulbs with compact fluorescent light bulbs or buying an Energy Star appliance to use less energy for the same or greater output.

Energy Efficiency and Conservation Block Grant (EECBG): The EECBG program funded through the American Recovery and Reinvestment Act and managed by the Department of Energy to assist cities, counties, states, and territories to develop, promote, and implement energy efficiency and conservation programs and projects.

Energy Efficiency Standards (Title 24, Part 6): Title 24 standards were first adopted in 1978 and established minimum energy efficiency standards for residential and nonresidential buildings. These standards are updated continually by providing more stringent energy budgets for new buildings in an effort to reduce California's energy consumption.

Energy Star: A joint program of the US Environmental Protection Agency and the US Department of Energy to provide consumers with information and incentives to purchase the most energy-efficient products available.

Energy Star Portfolio Manager: An online management tool that allows nonresidential building owners and tenants to track and assess energy and water use over time. Benchmarking energy and water use allows building owners to identify investment priorities, determine underperforming buildings, and verify efficiency improvements.

Environment: In CEQA, "the physical conditions which exist within the area which will be affected by a proposed project, including land, air, water, mineral, flora, fauna, noise, and objects of historic or aesthetic significance."

Environmental Impact Report (EIR): A report required by the California Environmental Quality Act which assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action or project. See California Environmental Quality Act (CEQA).

Environmentally Preferable Purchasing (EPP): California law requires state government to practice environmentally preferable purchasing, which is the procurement of goods and services that have a reduced impact on human health and the environment as compared to other goods and services serving the same purpose.

Feasible: Capable of being accomplished in a successful manner within a reasonable time, taking into account economic, environmental, social, and technological factors.

Floodplain: The relatively level land area on either side of the banks of a stream regularly subject to flooding. That part of the floodplain subject to a 1% chance of flooding in any given year is designated as an "area of special flood hazard" by the Federal Insurance Administration.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the 100-year flood without cumulatively increasing the water surface elevation more than 1 foot.

Fossil Fuel Facilities: Include, but are not limited to, oil and gas wells, separators, and refineries.

Global Warming Potential (GWP): An index used to translate the level of emissions of various gases into a common measure in order to compare the relative potency of different gases without directly calculating the changes in atmospheric concentrations. Greenhouse gases are expressed in terms of carbon dioxide equivalent. Global warming potentials are expressed in terms relative to carbon dioxide, which has a global warming potential of one.

Green Building: Sustainable or "green" building is a holistic approach to design, construction, and demolition that minimizes the building's impact on the environment, the occupants, and the community. See California Green Building Standards Code for green building regulations in California.

Greenhouse Gas or Greenhouse Gases (GHG): Gases which cause heat to be trapped in the atmosphere, warming the earth. Greenhouse gases are necessary to keep the earth warm, but increasing concentrations of these gases are implicated in global climate change. Greenhouse gases include all of the following gases: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The majority of greenhouse gases come from natural sources, although human activity is also a major contributor.

Greenhouse Gas Inventory: A greenhouse gas (GHG) inventory provides estimates of the amount of GHGs emitted to and removed from the atmosphere by human activities. A city or county that conducts an inventory looks at both community emission sources as well as emissions from government operations. A base year is chosen and used to gather all data from that year. Inventories include data collection from such things as vehicle miles traveled (VMTs), energy usage from electricity and gas, and waste. Inventories include estimates for carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs), which are referred to as the six Kyoto gases.

Green Waste: Refers to lawn, garden, or park plant trimmings and materials and can be used in home-composts or picked up curbside by municipal waste haulers.

Greywater: See Recycled Water.

Groundwater: Subsurface water in a zone of saturation.

Groundwater Overdraft: Develops when long-term groundwater extraction exceeds aquifer recharge, producing declining trends in aquifer storage. Overdraft is usually evident by declines in surface-water levels and stream flow, reduction or elimination of vegetation, land subsidence, and seawater intrusion.

Groundwater Recharge: Any of the approved methods that are designed to detain or slow surface water runoff so that percolation is enhanced.

Habitat: The physical location or type of environment in which an organism or biological population lives or occurs.

Imported Water: Water brought into the city from outside its boundaries (e.g., State Water Project).

Indicator: Types of data or information that can be used to determine the progress or success of each reduction measure.

LEED: Leadership in Energy and Environmental Design, a standard established by the US Green Building Council.

Light-Emitting Diode (LED): A lower energy consuming and longer-lasting alternative to incandescent and compact fluorescent light bulbs.

Low Carbon Fuel Standard (S-1-07): An executive order from former Governor Schwarzenegger, the Low Carbon Fuel Standard established the goal of reducing the carbon intensity of transportation fuels in California by 10% by 2020.

Low Impact Development (LID): An innovative stormwater management approach with a basic principle to design the built environment to remain a functioning part of an ecosystem rather than exist apart from it. LID's goal is to mimic a site's predevelopment hydrology by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to its source.

Metropolitan Planning Organization (MPO): A federally funded transportation planning organization comprising representatives from local government agencies and transportation authorities.

Mixed Use: Properties on which various uses such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with significant functional interrelationships and a coherent physical design. A single site may include contiguous properties.

National Ambient Air Quality Standards: The prescribed level of pollutants in the outside air that cannot be exceeded legally during a specified time in a specified geographical area.

Neighborhood Electric Vehicle (NEV): Small, battery-powered, low-speed electric vehicles. NEVs are typically limited to streets with a posted speed limit of 25 mph or less. NEVs are classified by the California Air Resources Board as zero emissions vehicles, as they do not produce any tailpipe emissions.

Nonattainment: The condition of not achieving a desired or required level of performance. Frequently used in reference to air quality.

Nonrenewable Energy: Energy from sources that use a nonrenewable natural resource such as uranium or fossil fuels such as coal, oil, or natural gas.

Operations and Maintenance (O&M): Refers to the activities related to the routine, preventive, predictive, scheduled, and unscheduled actions aimed at preventing equipment failure or decline with the goal of increasing efficiency, reliability, and safety.

Ordinance: A law or regulation set forth and adopted by a governmental authority, usually a city or county.

Ozone: Produced when gases or vapors created by cars, solvents, factories, and pesticides mix and react in the presence of sunlight. This results in certain health effects such as breathing difficulties, lung damage, coughing, and chest pains.

Particulate Matter (PM₁₀) and Fine Particulate Matter (PM_{2.5}): Fine mineral, metal, smoke, soot, and dust particles suspended in the air. While particulate matter also has many natural sources, human-derived sources such as vehicle exhaust, road dust, mineral quarries, grading, demolition, agricultural tilling, and burning are major contributors to exceedances. In addition to reducing visibility, particulate matter can lodge in the lungs and cause serious, long-term respiratory illness and other health problems. The smaller the size of the particle, the deeper it can penetrate into the lungs and the more difficult it is to expel.

Preservation: To keep safe from injury, harm, or destruction.

Property Assessed Clean Energy (PACE): See Assembly Bill 811.

Recycled Water, Reclaimed Water, Treated Sewage Effluent Water, or Greywater: Treated or recycled wastewater of a quality suitable for non-potable uses such as landscape irrigation; not intended for human consumption.

Reduction Measure: A goal, strategy, program, or set of actions that target and reduce a specific source of greenhouse gas emissions.

Regional Transportation Plan (RTP): A long-term blueprint of the region's transportation systems. The RTP is a federally mandated comprehensive long-range regional planning document that identifies the region's transportation needs, sets forth an action plan of projects, determines actions and programs to address the needs and issues, and documents the financial resources needed to implement the RTP.

Renewable Energy: Energy from sources that regenerate and are less damaging to the environment, such as solar, wind, biomass, and small-scale hydroelectric power.

Renewable Portfolio Standard (RPS): A regulation requiring utility companies in California to increase the production of renewable energy from solar, wind, or biomass, or from geothermal sources.

Retrofit Upon Sale: Requirements on real property to replace inefficient water or energy fixtures as a condition of escrow. Retrofit upon sale requirements typically require a certificate or other form of verification from local government agencies to ensure that the fixtures are replaced and meet minimum efficiency requirements.

Safe Routes to School (SR2S or SRTS): A national movement aimed at providing safe environments to encourage walking and bicycling surrounding local schools through engineering, enforcement, education, encouragement, and evaluation. Safe Routes to School programs are typically funded through federal, state, and local grants. SR2S is the California program; SRTS is the national program.

Scopes: Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are defined as follows:

- **Scope 1** – Direct emissions sources located within the unincorporated areas of the city, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas. GHG emissions from off-road agriculture equipment and nitrogen fertilizer application are considered Scope 1 emissions, while methane emissions from livestock are considered Scope 3.
- **Scope 2** – Indirect emissions that result because of activities in the unincorporated areas of the city and limited to electricity, district heating, steam, and cooling consumption. Scope 2 emissions sources include purchased electricity used in the unincorporated areas and associated with the generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community's electricity consumption.
- **Scope 3** – All other indirect emissions that occur as a result of activity in the unincorporated areas. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside of the unincorporated areas of the city.

Senate Bill (SB) 7: Passed in 2009, SB 7 requires the state to achieve a 20% reduction in per capita water use by 2020. This law also requires local water providers to comply with the 20% reduction at the risk of becoming ineligible for state grant or loan funding.

Senate Bill (SB) 97: Requires lead agencies to analyze GHG emissions and climate change impacts under the California Environmental Quality Act.

Senate Bill (SB) 375: Directs the metropolitan planning organizations in California to create a Sustainable Communities Strategy (SCS) as part of the regional transportation plan. The SCS will demonstrate how the region will achieve the 2020 and 2035 greenhouse gas reduction targets for the region set by CARB.

Senate Bill (SB) 407: Adopted in 2010, SB 407 requires inefficient plumbing fixtures be replaced with more efficient models at the time of property sale or improvement. See Retrofit Upon Sale.

Senate Bill (SB) 610 (Chaptered at Water Code 10910): Requires CEQA review of certain large residential and commercial projects to include a water supply assessment that proves that adequate water exists for the project.

Senate Bill (SB) 1016: Adopted in 2008, SB 1016 establishes per capita waste disposal rate requirements and goals for local agencies in California. The requirements are expressed in a pounds per person per day measurement.

Senate Bill (SB) 1881: Requires local agencies to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

Smart Grid: The smart grid delivers electricity from suppliers to consumers using two-way digital communications. The smart grid is envisioned to overlay the ordinary electrical grid with an information and net metering system, which includes smart meters. Smart meters will allow consumers to become more aware of their energy use and in the future will allow smart grid enabled appliances to be pre-programmed to operate at a time when electricity costs are lowest.

Sustainability: Community use of natural resources in a way that does not jeopardize the ability of future generations to live and prosper.

Sustainable Communities Strategy (SCS): The land use element of each MPO's Regional Transportation Plan as required by SB 375. The SCS will demonstrate how the region will achieve the 2020 and 2035 VMT and GHG reduction targets for the region set by CARB.

Sustainable Development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Transit-Oriented Development (TOD): A mixed-use residential or commercial area designed to maximize access to transit options.

Transportation Demand Management (TDM) Plan: A voluntary or mandatory program developed by local agencies, large employers, or high traffic commercial services to limit the amount of congestion and pollution related to transportation demand. TDM plans may include incentives, regulations, and education about transportation alternatives.

Trustee Agency: A state agency having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the State of California. There are four trustee agencies: the Department of Fish and Game, the State Lands Commission, the Department of Parks and Recreation, and the University of California.

Urban Heat Island: The term "heat island" describes built-up areas that are hotter than nearby rural areas. On a hot, sunny summer day, roof and pavement surface temperatures can be 50–90°F (27–50°C) hotter than the air, while shaded or moist surfaces remain close to air temperatures. These surface urban heat islands, particularly during the summer, have multiple impacts and contribute to atmospheric urban heat islands. Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.

Urban Reserve: An area outside of an urban service area but within an urban growth boundary, in which future development and extension of municipal services are contemplated but not imminent.

Vehicle Miles Traveled (VMT): A key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve regional air quality goals.

Volatile Organic Compounds (VOC): A variety of chemicals with both short- and long-term adverse health effects. VOCs are emitted as gases from a wide array of products such as paints, lacquers, cleaning supplies, markers, and office equipment and furnishings.

Vulnerable Populations: There are three primary segments of vulnerable populations: those at risk to adverse climate change impacts due to exposure, sensitivity, or adaptive capacity.

- **Exposure:** Physical conditions may put particular populations at risk to the impacts of climate change. For instance, populations living in low-lying or coastal areas may be more exposed to flooding events and sea level rise, while those who work outside may suffer from health-related issues due to increased temperatures and decreased air quality.
- **Sensitivity:** Certain populations, including young children and those over the age of 65, are physiologically more sensitive to extreme temperatures and increased instances of air pollution.
- **Adaptive Capacity:** The adaptive capacity of lower-income and institutionalized populations can be limited due to lower access to the resources necessary to prepare for or react to the long-term impacts of climate change and the increased frequency of disasters.

Water Conservation: Reducing water use, such as turning off taps, shortening shower times, and cutting back on outdoor irrigation.

Water Efficiency: Replacing older technologies and practices in order to accomplish the same results with less water; for example, by replacing toilets with new low-water-using models and by installing “smart controllers” in irrigated areas.

Water-Efficient Landscape: Native or low-water-using landscapes. Water-efficient landscapes are required by law in all cities and counties in California to conserve water.

Watershed: The total area above a given point on a watercourse that contributes water to its flow; the entire region drained by a waterway or watercourse that drains into a lake or reservoir.

Zero Emissions Vehicle (ZEV): A vehicle that does not emit any tailpipe emissions from the on-board source of power. Both electric and hydrogen fuel cell vehicles are classified as ZEVs.

APPENDIX A



GHG INVENTORY METHODOLOGY

This technical appendix provides additional information on how the results of the City's 2008 community-wide greenhouse gas emissions inventory were calculated. A brief overview of how emissions are calculated using activity data and emissions factors is presented, followed by an explanation of overarching data parameters and limitations that are common in GHG inventories.

BASELINE GREENHOUSE GAS EMISSIONS INVENTORY METHODOLOGY

This technical appendix provides additional information on how the results of the City's 2008 community-wide greenhouse gas emissions inventory were calculated. First, a brief overview of how emissions are calculated using activity data and emissions factors will be presented, followed by an explanation of overarching data parameters and limitations that are common in GHG inventories. Next, a more detailed explanation of the data used to calculate emissions will be presented. Specifically, the following information is provided for each emissions sector found in the baseline inventory section of **Chapter 2**:

- Activity data and source
- Emissions factor and source
- Calculation methodology
- Modeling methodology (if applicable)

Inventory Background

Sunnyvale's GHG inventory is guided by the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act Air Quality Guidelines, adopted in June 2010. The guidelines include an appendix entitled "Recommended Plan-Level GHG Quantification Guidance." The guidance is recommended for any plan or program that will be used as a programmatic tiering document under the California Environmental Quality Act (CEQA) according to BAAQMD's definition of a Qualified GHG Reduction Strategy.

GHG Emissions Activities

The guidelines indicate that the following sources are to be included in any inventory that will be used in a Qualified GHG Reduction Strategy:

- Commercial and industrial energy (natural gas and electricity, including direct access)
- Residential energy (natural gas and electricity)
- Transportation (highway, non-highway)
- Waste (direct landfill emissions, emissions from community waste)
- Water (wastewater treatment, energy for filtration and movement)
- Off-road equipment and vehicles (lawn and garden equipment, construction vehicles and equipment)
- Stationary sources (major industrial point source emissions)

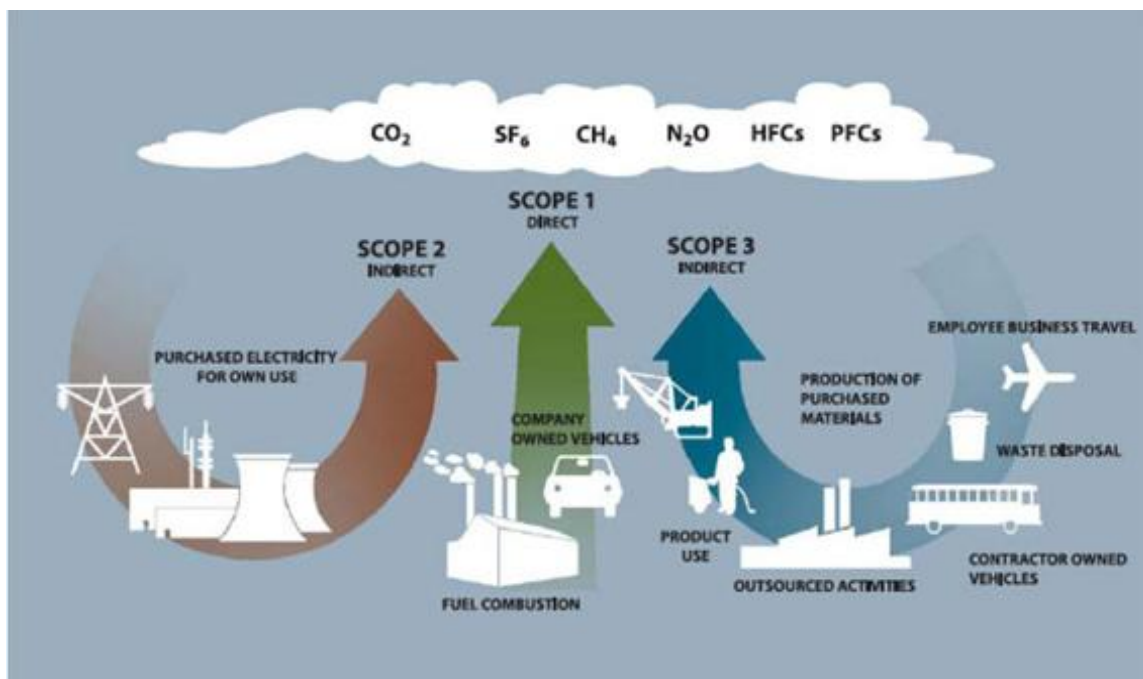
BAAQMD's guidance is consistent with industry best practices and international protocol. In the absence of a California or national community-wide inventory protocol, it is the best-available methodology for use within the BAAQMD's boundary.

GHG Emissions Scopes

Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are depicted in **Figure A-1** and defined as follows:

- Scope 1 – Direct emissions sources located within the city, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas. GHG emissions from off-road agriculture equipment and nitrogen fertilizer application are considered Scope 1 emissions, while methane emissions from livestock are considered Scope 3.
- Scope 2 – Indirect emissions that result because of activities in the city and limited to electricity, district heating, steam and cooling consumption. Scope 2 emissions sources include purchased electricity used in the unincorporated areas and associated with the generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community's electricity consumption.
- Scope 3 – All other indirect emissions that occur as a result of activity in the unincorporated areas. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside of the city boundary.

FIGURE A-1 – GHG EMISSIONS ACTIVITIES BY SCOPE



Source: New Zealand Business Council for Sustainable Development. 2002. *The Challenge of GHG Emissions: The "why" and "how" of accounting and reporting for GHG emissions: An Industry Guide*

Overview of Calculation Methodology

The GHG emissions inventory starts with collecting activity data for each sector listed above, such as the kilowatt-hours (kWh) of electricity used or therms of natural gas used for the residential, commercial, and industrial energy sectors, the vehicle miles traveled for the transportation sector, or million gallons (MG) of water used by the community in a single calendar year. These activities are converted into GHG emissions using an emissions factor or coefficient. These emissions factors are supplied by the energy provider or emissions modeling software and indicate the greenhouse gases that are emitted for every kWh produced, mile traveled, or ton of waste disposed. The coefficients used for calculating emissions from each activity follow international inventory standards and are utility-, county-, or California-specific, when available.

For example, if a community consumed 1 million kilowatt-hours of electricity and each kWh of electricity results in 0.0004 metric tons (MT) of CO₂, the CO₂ emissions calculation would be as follows:

$$1 \text{ million kWh} * .0004 \text{ MTCO}_2/\text{kWh} = 400 \text{ MTCO}_2$$

Primary Greenhouse Gases

The inventory measures three primary GHG emissions—carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). These greenhouse gases are then converted to carbon dioxide equivalents (CO₂e), enabling the City to consider different greenhouse gases in comparable terms. The conversion of greenhouse gases is done by comparing the global warming potential (GWP) of each gas to CO₂. For example, methane (CH₄) is 21 times more powerful than CO₂ on a per weight basis in its capacity to trap heat, and therefore one metric ton of CH₄ would be calculated as 21 metric tons of CO₂e, while nitrous oxide (N₂O) is 310 times more powerful than CO₂ and would be calculated as 310 MTCO₂e.

Data Parameters

The inventory was developed with the best-available tools, data, and methodology; however, as with any GHG inventory, there are limitations to representing all sources of emissions in a local jurisdiction. The main factors that limit GHG inventories include (1) data availability, (2) privacy laws, and (3) deficient methodology. The following section highlights specific emissions sources or methodology deficiencies that limit the inclusion of specific sources in a GHG inventory.

Data Availability

Greenhouse gas inventories are a relatively new practice at the local government level. As such, there are some emissions sources for which no data is available or for which there is no methodology to convert activity to emissions. Lack of available data or methodology prevented the calculation of emissions from the following sources for the following reasons:

- Off-road vehicles and equipment (aside from lawn/garden and construction equipment) – The CARB OFFROAD 2007 software provides emissions from a range of activities. These numbers are aggregated for the entire Santa Clara County area, including incorporated, unincorporated, and state- or federally owned land. The BAAQMD has provided guidance on attributing countywide off-road equipment emissions from lawn and garden equipment as well as construction equipment to each jurisdiction, but at this time, there is not a method to disaggregate the remaining data by jurisdiction. Examples of remaining off-road emissions sources include watercraft, recreational vehicles, and mining equipment.
- Rail (aside from Caltrain) – The federal government does not release information regarding the efficiency, fuel consumption, or mileage of locomotives traveling through Sunnyvale.
- Propane use – Propane is essentially an unregulated fuel in California (except for storage and safety issues, which are regulated). Because it is an unregulated commodity, no data is collected by the State on propane sales or usage.
- Refrigerants – Similar to propane, above, the amount of fugitive refrigerant emissions cannot be calculated because sales are not tracked.

The above-mentioned sources are recognized data limitations for local inventories. Many of these sources are available at the state, county, or national level, but cannot yet be accurately estimated for the City based on available activity data indicators.

Privacy Laws

Commercial, industrial, and institutional electricity and natural gas are combined into a nonresidential category due to the California 15/15 rule. The 15/15 rule was adopted by the California Public Utilities Commission in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 Rule requires that any aggregated information provided by the utilities must include at least 15 customers and that a single customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened already using the 15/15 Rule, the customer must be dropped from the information provided.

Methodology Limitations

An appropriate methodology for estimating life-cycle emissions is still under development and is not recommended for inclusion in a community-wide inventory. Life-cycle emissions are emissions associated with the production and disposal of items consumed by a community (i.e., “cradle-to-grave”). For instance, a life-cycle assessment of vehicle emissions would include those from designing, extracting raw materials, producing, delivering, and disposing of each car in the city. In contrast, this analysis only captures how much that car is driven in the city consistent with standard protocol.

Review of similar inventories, including the California Greenhouse Gas Inventory prepared by the California Air Resources Board, indicates that those sources not included in the inventory for the reasons stated above comprise less than 5% of total emissions in the city. The emissions identified in this report are primarily GHGs that the community has directly caused and has the ability to reduce through implementation of conservation actions, a CAP, or corresponding efforts.

Inventory Detail by Scope and Sector

This inventory includes Scope 1, Scope 2, and Scope 3 sources from the following sectors: residential energy, commercial/industrial energy, transportation landfill gas, community waste, water, mobile off-road equipment, Caltrain, and stationary sources.

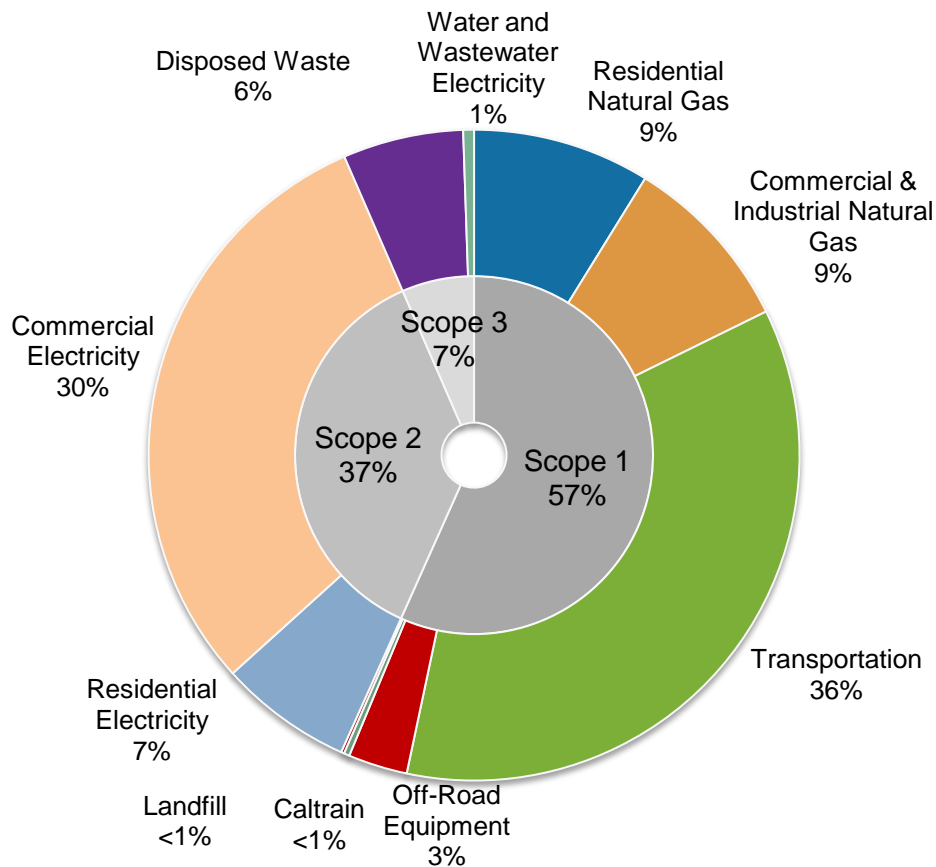
Sunnyvale emitted approximately 1,270,170 metric tons of carbon dioxide equivalents (MTCO₂e) in the baseline year 2008. As shown in **Table A-1** and **Figure A-2**, the commercial/industrial energy sector is the largest contributor at 39%, producing approximately 502,210 MTCO₂e in 2008. Emissions from the transportation sector were the next largest contributor, accounting for 35% of the total emissions, producing approximately 442,610 MTCO₂e. The residential sector accounted for 16% of the total emissions (198,140 MTCO₂e), and emissions from community waste comprised 6% of the total (76,970 MTCO₂e). Emissions were also inventoried for off-road equipment and water/wastewater treatment, making up 3% and 1% of total emissions, or 37,830 MTCO₂e and 6,870 MTCO₂e, respectively. Landfill and Caltrain emissions were the smallest contributors with 3,600 MTCO₂e and 1,944 MTCO₂e, respectively.

Figure A-2 also shows that the majority of emissions are within Scope 1 (56%) and Scope 2 (37%). These emissions were either emitted within the city or directly and immediately caused by activity within the city in 2008. Scope 3 emissions are 7% of the inventory and include emissions that are caused by activity within the city, but are either emitted over long periods or have a less direct impact than Scope 1 and 2 emissions under best-available methodologies.

TABLE A-1– DETAILED EMISSIONS BY SOURCE AND SECTOR

Sector	Subsector	Activity		Source	MTCO ₂ e	Scope
Residential Energy	Electricity	292,574,600	kWh	PG&E	84,850	2
	Natural Gas	21,346,400	Therms	PG&E	113,290	1
Commercial/Industrial Energy	Electricity	1,336,804,600	kWh	PG&E	387,700	2
	Natural Gas	21,576,000	Therms	PG&E	114,510	1
Community Waste	Landfilled Waste	100,900	Tons	CalRecycle	76,970	3
	Alternative Daily Cover	700	Tons	CalRecycle		

Sector	Subsector	Activity		Source	MTCO ₂ e	Scope
Transportation	On-road Vehicles	881,838,400	VMT	TDF Model, CARB	442,610	1
Water	Water Supply	6,500	Million Gallons	BAWSCA	1,720	3
	Water Treatment & Distribution	7,509,800	kWh	BAWSCA, CEC	2,180	3
	Wastewater Treatment	10,251,700	kWh	CEC	2,970	3
Off-Road	Lawn and Garden	900	Gallons of Gasoline	CARB	2,900	1
		400	Gallons Diesel	CARB		
	Construction	200	Gallons of Gasoline	CARB	34,930	1
		9,500	Gallons Diesel	CARB		
Landfill	Landfill Gas Emissions	58,000,000	Cubic Ft Gas	City Staff	3,600	1
Caltrain	Passenger Miles Traveled	29,156,400	Passenger Miles	Caltrain, LGOP	1,940	1
TOTAL					1,270,170	

FIGURE A-2– EMISSIONS BY SCOPE AND SECTOR

Stationary Sources

Stationary sources are any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food-processing plants, and other heavy industrial sources. At the recommendation of the BAAQMD, stationary source emissions are discussed in this inventory for informational purposes only, as stationary source emissions are influenced by market forces beyond the City's local influence and are instead best addressed and regulated by the BAAQMD or through federal and state programs. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the City's influence; therefore, stationary source emissions are excluded from **Table A-1** and **Figure A-2** as well as from all further discussions of this inventory after **Table A-2**.

A list of stationary source emissions within the City of Sunnyvale was not available so emitters in Sunnyvale were included from the BAAQMD's 2008 report titled "Source Inventory of Bay Area Greenhouse Gas Emissions." These sources are listed below in **Table A-2**.

TABLE A-2 – LARGE STATIONARY EMITTERS

Source	MTCO ₂ e
Lockheed Martin Corporation	18,630
City of Sunnyvale/Public Works	14,200
City of Sunnyvale Water Pollution Control	2,350
Northrop Grumman Systems Corporation	7,350
Spancion LLC	4,560
Onizuka Air Force Base	3,570
TOTAL	50,660

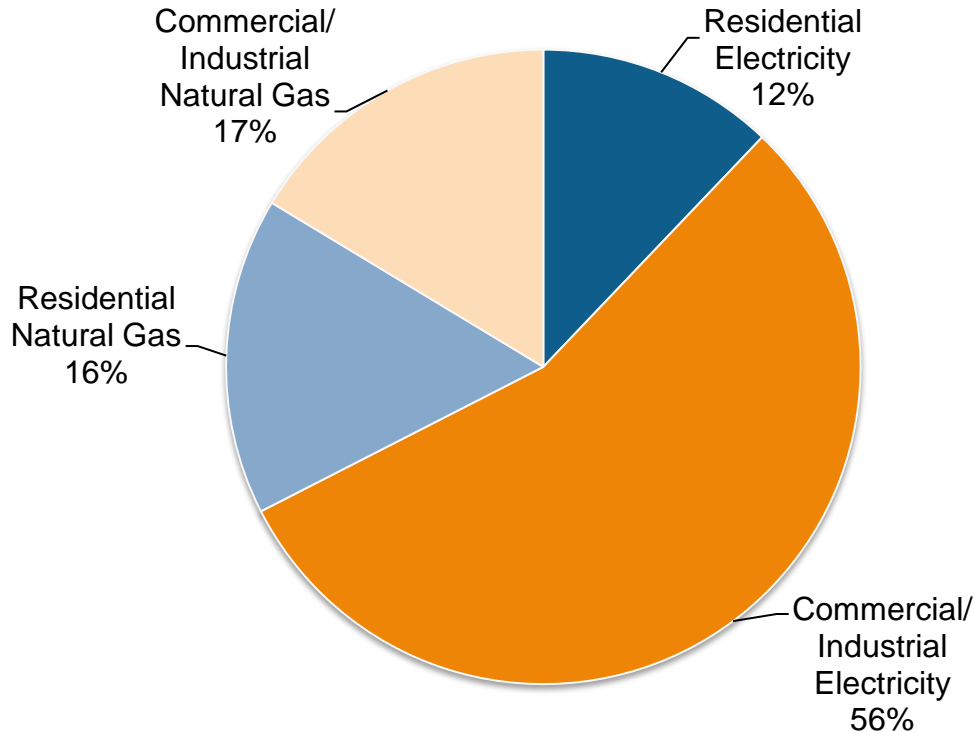
Excluding stationary sources allows the City to set accurate emissions reduction targets. The exclusion of large stationary sources from local inventories and reduction plans is also supported by the BAAQMD. Stationary sources accounted for approximately 50,660 MTCO₂e in 2008. It is unknown whether or how stationary source emissions will change in the future; however, new potential emitters will be approved and noticed by the BAAQMD through current permitting processes.

The Built Environment

With all scopes and sectors aggregated, 55% of total community-wide emissions in the year 2008 came from the “built environment” (see residential and commercial/industrial energy sectors in **Table A-1**). The built environment comprises residential and commercial/industrial natural gas and electricity consumption. As shown in **Figure A-3** below, nonresidential electricity use makes up 56% of emissions from the built environment, while nonresidential gas, residential natural gas, and residential electricity make up 17%, 16%, and 12%, respectively.

Pacific Gas and Electric Company (PG&E) provided electricity and natural gas consumption for entities within the city. Commercial, industrial, and direct access electricity are combined in the nonresidential category due to the California 15/15 rule (see Privacy Laws subsection).

PG&E provided a 2008 carbon dioxide (CO₂) coefficient for electricity and natural gas. Coefficients for methane (CH₄) and nitrogen dioxide (N₂O) emissions were provided by the California Air Resources Board’s Local Government Operations Protocol (LGOP) version 1.1 and were converted into carbon dioxide equivalents and added to the CO₂ coefficient to create a CO₂e coefficient.

FIGURE A-3 – BUILT-ENVIRONMENT GHG EMISSIONS BY SECTOR

Transportation

Transportation emissions accounted for 36% of the 2008 inventory (see **Table A-1**). As with the majority of California municipalities, travel by on-road motorized vehicles constitutes the greatest percentage of GHG emissions in the city. Using origin-destination analysis, three types of vehicle trips were tracked separately for AM and PM peak periods in Sunnyvale:

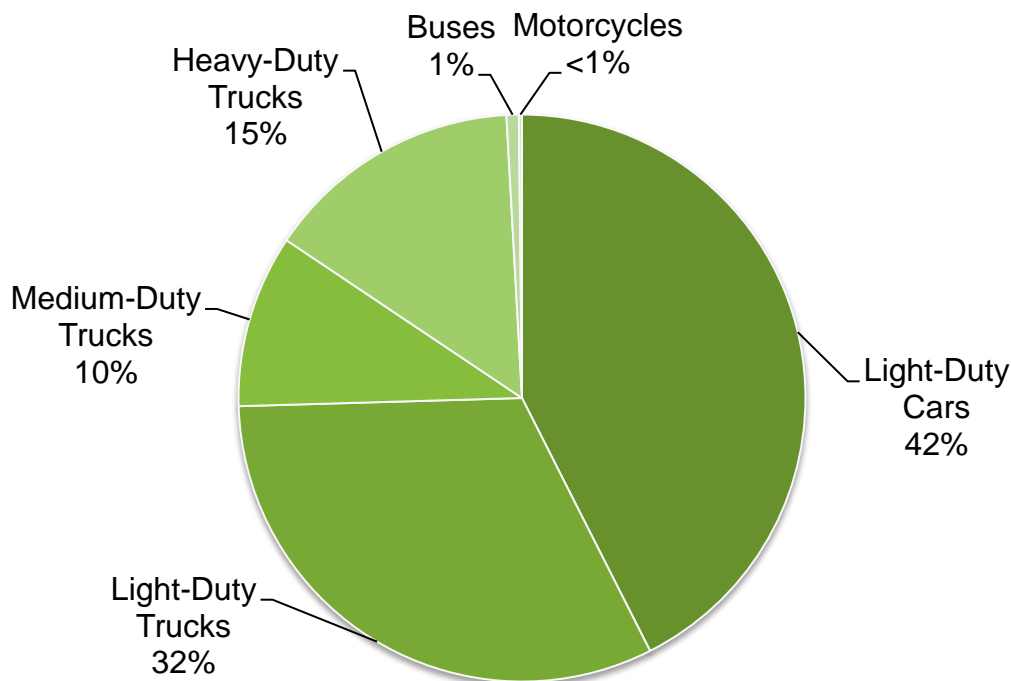
- Internal-Internal: Vehicle trips that remained inside Sunnyvale
- Internal-External and External-Internal: Vehicle trips that have an ending or a beginning in Sunnyvale and another outside of Sunnyvale
- External-External: Vehicle trips that pass through Sunnyvale

Using the recommendation of the Regional Target Advisory Committee (RTAC), the body responsible for Senate Bill 375 target setting, vehicle miles traveled (VMT) from trips of type 1, 2, and 3 were counted 100%, 50%, and 0% respectively toward jurisdiction-generated VMT.

Transportation-related greenhouse gas emissions were calculated using the CARB Emissions Factor 2007 (EMFAC2007) software. The GHG emissions by vehicle type are shown in **Figure A-4**. Light-duty autos such as compact cars and light-duty trucks such as SUVs and pickup trucks contribute 42% and 32% of transportation-related emissions, respectively. The remaining 26% of emissions are the result of medium and heavy-duty vehicles, buses, and motorcycles. EMFAC2007 provides carbon dioxide emissions

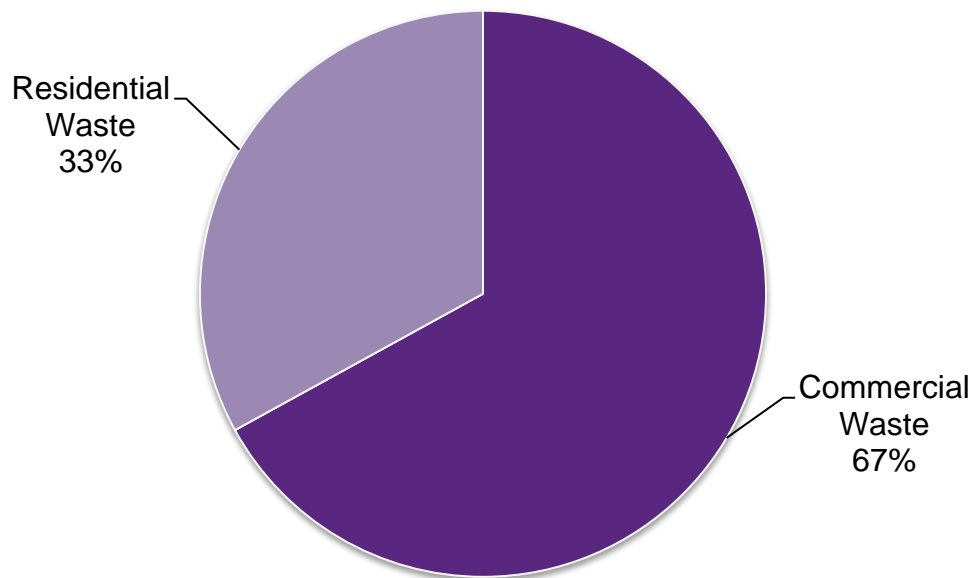
according to the unique vehicle composition of each county in California, including Santa Clara County, which was used for this report. Individual GHGs such as carbon dioxide, methane, and nitrous oxide are converted to CO₂e by multiplying the CO₂ emissions by a conversion factor provided by the US Environmental Protection Agency of 100/95.

FIGURE A-4 – TRANSPORTATION-RELATED GHG EMISSIONS BY VEHICLE CLASS



Waste

Solid waste disposed of at managed landfills was responsible for 6% of total emissions for the community (see **Table A-1**). Waste emissions are considered Scope 3 emissions because they are not generated in the base year but will result from the decomposition of waste generated in 2008 over the full 100-year cycle of its decomposition. Waste and alternative daily cover (ADC) tonnages were provided by CalRecycle. Waste tonnages include waste sent to landfills from Sunnyvale. ADC is the temporary cover material placed on top of landfilled waste at the end of each day to control occurrences such as odors and scavenging. The ADC is landfilled along with other waste, and some types of ADC, including green waste and sludge, release GHG emissions. According to CalRecycle, 33% of Sunnyvale's waste is from residential sources and 67% from commercial; these percentages are translated into emissions in **Figure A-5**.

FIGURE A-5 – WASTE EMISSIONS BY SECTOR

Landfill emissions are estimated using the California Air Resources Board Landfill Emissions Tool, version 1.2. The Landfill Emissions Tool uses the Intergovernmental Panel on Climate Change (IPCC) first-order decay model to calculate methane emissions. The tool defaults to an anaerobically degradable organic carbon (ANDOC) value of 8% based on California statewide waste composition in 2005. The analysis relied on the California statewide waste composition since localized data was not available. CO₂ emissions are not included in this analysis due to their biogenic origin.

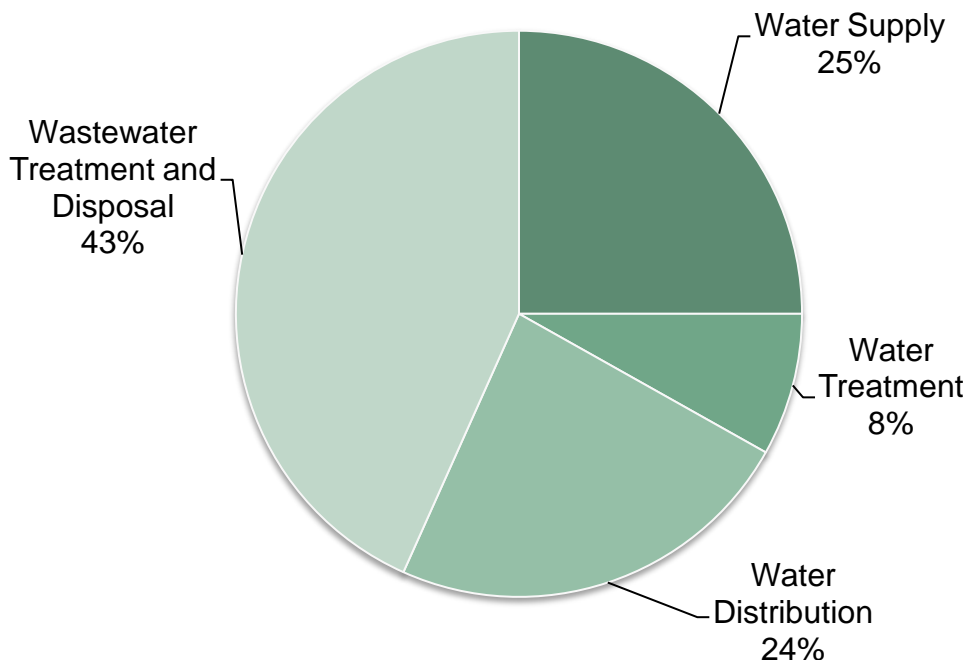
Water/Wastewater

Water-related emissions include the electricity use required to convey, treat, distribute, collect, and dispose of water used by residences, businesses, and institutions in the City of Sunnyvale. These emissions also include the direct process emissions from wastewater treatment. Sunnyvale receives its water from a variety of sources, including the San Francisco Public Utilities Commission (SFPUC), Santa Clara Valley Water District (SCVWD), wells, and recycled water.

Water and wastewater emissions accounted for 1% of total GHG emissions in 2008 (see **Table A-1**). This inventory includes emissions from the electricity used to process, treat, and move water and wastewater to and from the city and direct process emissions from wastewater treatment. GHG emissions by type of activity are summarized in **Figure A-6**. While this sector may potentially double-count electricity consumption captured in the energy sector, water and wastewater emissions are calculated separately to comply with BAAQMD guidance. The overlap between electricity and water and wastewater energy is anticipated to have a negligible effect on the inventory, due to the small contribution of the water and wastewater sector.

Indirect emissions from the conveyance, treatment, and delivery of water and the treatment and disposal of wastewater were provided by the CPUC's 2010 water-energy relation inventory and the CEC's 2006 water energy inventory.

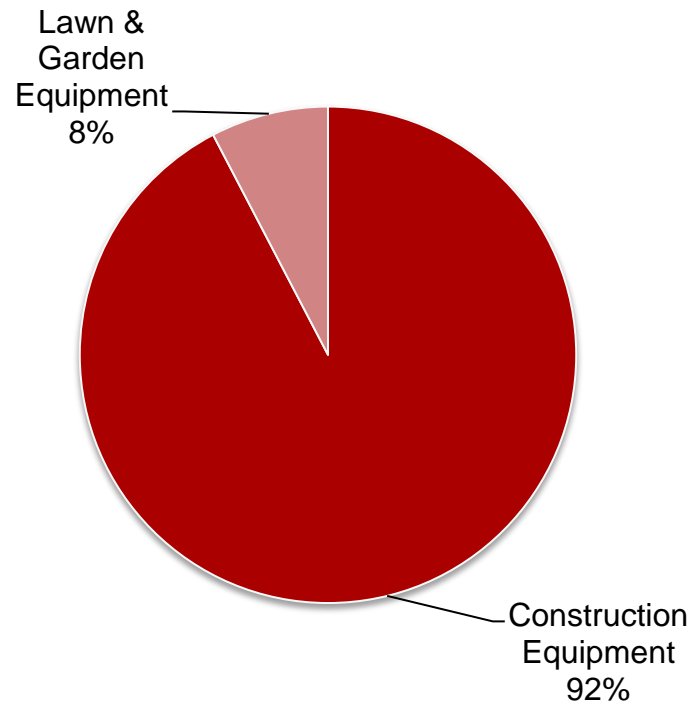
FIGURE A-6 – DETAILED WATER AND WASTEWATER EMISSIONS BY SOURCE



Off-Road

Off-road vehicles and equipment related to construction and lawn and garden activities accounted for 3% of emissions in 2008 (see **Table A-1**). While several other off-road equipment uses contribute to emissions in Santa Clara County, currently there is no practical methodology to attribute countywide marine, recreational, airport, or other equipment and vehicles to each individual jurisdiction within the county. CARB's OFFROAD 2007 program provides construction and lawn and garden activity per county in the state. As shown in **Figure A-7**, GHG emissions from construction and lawn and garden activity make up 92% and 8% of off-road emissions, respectively. Per BAAQMD guidance, county-level activity and emissions for off-road equipment were attributed to the city using the following indicators:

- Total county construction equipment emissions were attributed to Sunnyvale using the proportion of new housing units built within the city compared to the entire county using the US Department of Housing and Urban Development's (HUD's) State of the Cities Data Systems building permit reporting system.
- Total county lawn and garden emissions were attributed to the city using the proportion of existing households within Sunnyvale compared to the entire county using California Department of Finance (DOF) figures for 2008.

FIGURE A-7 – OFF-ROAD EMISSIONS BY SOURCE

Caltrain

Emissions in 2008 from trips taken to or from Sunnyvale by Caltrain are a result of the combustion of diesel fuel on the locomotive fleet and contribute less than 1% of total emissions in 2008. The total number of trips and trip lengths that begin or end in Sunnyvale were determined using 2008 annual weekday Caltrain ridership counts. Weekday trips were summed to determine a weekly and annual number of trips and annual passenger miles traveled to or from Sunnyvale. Total annual passenger miles traveled were multiplied by MTCO₂e per passenger mile coefficient. Half of each trip was attributed to Sunnyvale as the other half of the trip would be attributed to the origin or destination outside of the city. Emissions coefficients for locomotives are provided by the Local Government Operations Protocol (LGOP).

Landfill Gas

Direct landfill gas (LFG) emissions from the closed Sunnyvale Landfill are measured directly through the gas capture system in place. Mark Bowers, the City's Solid waste Division Manager, provided these measurements in the form of standard cubic feet. This volume of LFG captured for 2008 was converted into MTCO₂e using equation 9.2 in the Local Government Operations Protocol v1.1. For information not available regarding the landfill and the exact content of the gas capture, default factors, found in LGOP, were used. The City was able to capture about 58 million cubic feet of LFG in 2008. Captured landfill gas is blended with waste water digester gas to power Sunnyvale's wastewater treatment plant. However, since not all LFG can be captured, an additional 3,600 MTCO₂e were also emitted resulting in <1% of total community-wide emissions.

APPENDIX B



GHG TECHNICAL APPENDIX

This Technical Appendix provides detailed descriptions, performance indicators, estimated costs, and assumptions for each GHG reduction measure in this Climate Action Plan.

CLIMATE ACTION PLAN TECHNICAL APPENDIX – METHODOLOGY AND ASSUMPTIONS FOR GHG QUANTIFICATION

This Technical Appendix provides detailed descriptions, performance indicators, estimated costs, and assumptions for each GHG reduction measure in this Climate Action Plan.

OS-1 Open Space

Maintain and increase the amount of open space in Sunnyvale consistent with the Council policy and the Consolidated General Plan so that there is a minimum of 5.34 acres per 1,000 population.

Action Items:

OS-1.1. Achieve and maintain an open space to population ratio of 5.5 acres per 1,000 residents.

GHG Assumptions:

	2010	2020	2035
New park space (acres)	0	64	146
Number of trees per acre	10	10	10
Number of trees planted	0	637	1,456

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	20	50

Performance Indicators:

New acres of parkland

Costs and Savings:

City Costs:	<i>Very High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

The City of Sunnyvale Parks and Recreation Department completed the Parks of the Future Plan in November 2008. The plan states that Sunnyvale has a current park-to-population ratio of 5.5 acres of parkland per 1,000 residents. While the plan outlines ways in which the City can achieve a future ratio of 5.3 acres per 1,000 residents, this analysis assumes a more realistic target of maintaining the current park-to-resident ratio in 2020 and 2035. This would necessitate 64 more acres of parkland by 2020 and 14 additional acres by 2035. This reduction measure assumes a rate of 10 new trees per acre of new parkland. This ratio is based on regional averages and observed practices. Total emissions reduction includes annual sequestration during a 40-year life cycle of open space vegetation and trees and avoided emissions from the reduction in electricity consumption as a result of direct shading and overall climate cooling. This measure assumes a distribution of 70% deciduous and 30% evergreen trees and a 30-60-10 distribution of large, medium, and small trees.

Sources:

City of Sunnyvale Parks and Recreation Department. 2008. Parks of the Future Plan.

McPherson, et al. 2000. The potential of urban tree plantings to be cost effective in a carbon market.

OS-2 Outdoor Meeting Space

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.

Action Items:

–

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	Supportive Measure		

Performance Indicators:

N/A

Costs and Savings:

City Costs:	<i>Minimal</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

This cost and greenhouse gas impact of this measure is unknown.

Sources:

N/A

OS-3 Urban Forestry

Increase the number of shade trees planted in the community, and protect the existing tree stock.

Action Items:

OS-3.1. Continue to implement the City's Tree Preservation requirements.

OS-3.2. Develop and implement canopy coverage requirements for City-owned parking lots, with exceptions for solar installations.

OS-3.3. Promote tree planting on private property through incentive and support programs.

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.

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.

GHG Assumptions:

	2010	2020	2035
Number of trees planted (private and public)	925	7,400	18,500
Percentage increase in tree planting	1%	4%	10%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	40	330	820
GHG Reduction with CCA	40	290	730

Performance Indicators:

Number of new street trees planted

Costs and Savings:

City Costs:	<i>Medium</i>
City Savings:	<i>Low</i>
Community Costs:	<i>Low</i>
Community Savings:	<i>Medium</i>

Methodology:

Total emissions reduction includes annual sequestration during a 40-year life cycle of a forestry program and avoided emissions from the reduction in electricity consumption as a result of direct shading and overall climate cooling. The City of Sunnyvale maintains over 37,000 street trees. For this measure, we assume that there is one private property tree for every street tree in Sunnyvale and assume that the City will facilitate a 4% and 10% increase in trees by 2020 and 2035, respectively. This measure assumes a distribution of 70% deciduous and 30% evergreen trees and a 30-60-10 distribution of large, medium, and small trees. Distribution of trees is proportional to the distribution of the age of the city's building stock based on regional averages.

Sources:

McPherson, et al. 2000. The potential of urban tree plantings to be cost effective in a carbon market.

EC-1 Lighting Efficiency

Increase the use of efficient indoor and outdoor lighting technologies.

Action Items:

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.

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.

EC-1.3. Require new private parking lot lighting to use energy-efficient lighting technologies.

GHG Assumptions:

	2010	2020	2035
Number of streetlights replaced with LED	0	6,647	8,862
Energy savings (kWh)	0	1,359,874	1,813,165
Percentage of streetlights replaced	0%	75%	100%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	330	390
GHG Reduction with CCA	0	220	210

Performance Indicators:

Percentage of City streetlights replaced with LED

Costs and Savings:

City Costs:	<i>Very High</i>
City Savings:	<i>Medium-High</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

In 2007, the City completed a Climate Action Plan for City government operations. The CAP included an estimate of energy savings from LED streetlight replacements for the City's 8,862 streetlights. The kWh savings are for 2006 energy consumption; however, streetlight energy consumption is assumed to be consistent from year to year. Parking lot lighting is not quantified as part of this measure due to overlap with the City's Green Building Ordinance.

Source:

KEMA. 2007. City of Sunnyvale Climate Action Plan – City Operations.

EC-2 New Construction and Remodels

Require green building practices in new residential and commercial development and remodels.

Action Items:

EC-2.1. Evaluate and update the 2009 Zoning Code for Green Buildings for single-family, multi-family, and nonresidential building construction and major remodels every three to five years consistent with upgrades to the California Green Building Standards Code (CALGreen).

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.

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.

GHG Assumptions:

	2010	2020	2035
Improvement over Title 24 minimum requirements	0%	15%	15%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	5,130	12,890
GHG Reduction with CCA	0	4,440	10,570

Performance Indicators:

Compliance with Green Building Ordinance and CALGreen

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>High</i>
Community Savings:	<i>High</i>

Methodology:

This measure calculates the impact of the adopted Sunnyvale Green Building Checklist for residential and nonresidential buildings. The Build It Green and LEED checklists were analyzed for consistency with voluntary measures of the 2008 CALGreen Code and then analyzed using the 2008 Title 24 Impact Analysis completed by the California Energy Commission in 2007. Cost and savings to the community are based on the Pacific Gas & Electric analysis of a 15% CALGreen standard for Sunnyvale's climate zone. The majority of City costs to update and maintain the Green Building Code are assumed to be covered by impact fees.

Sources:

California Building Standards Commission. 2010. 2010 California Green Building Standards Code. California Code of Regulations Title 24, Part 11. Sacramento.

California Energy Commission. 2010b. 2008 Title 24 Impact Analysis. http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PD.

City of Sonoma. 2010. Analysis of CALGreen (California Green Building Standards Code) with Mandatory Tier 1 (CALGreen+Tier1) Compared to Existing City of Sonoma Green Building Requirements. http://www.asgi.us/calgreen /CALGreenTier1_CityOfSonoma_analysis.pdf.

City of Sunnyvale. 2010. Green Building Checklist.

Pacific Gas & Electric. 2010. Codes and Standards Title 24 Energy-Efficient Local Ordinances. http://www.energy.ca.gov/title24/2008standards/ordinances /sancarlos/2010-12-29_pge_zone_3_Cost_Study.pdf.

EC-3 Residential Energy Efficiency

Reduce residential energy use, with emphasis on existing homes built before 1990.

Action Items:

EC-3.1. Establish a residential energy conservation ordinance that requires homeowners to perform and disclose energy and water audits at time of sale.

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.

EC-3.3. Prioritize non-general funds to assist low-income homeowners achieve energy-efficient improvements. Program annual Community Development Block Grant (CDBG) funds to fund weatherization programs.

GHG Assumptions:

	2010	2020	2035
Percentage of homes turned over	0%	20%	75%
Participation rate of sold properties	0%	40%	40%
PACE residential participation rate	0%	15%	35%
Average energy reduction per household	25%	25%	25%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	210	8,330	23,760
GHG Reduction with CCA	210	7,350	20,060

Performance Indicators:

Percentage of homes and businesses that respond to energy audits and percentage that participate in a PACE program

New units receiving building permits

Costs and Savings:

City Costs:	<i>Medium-High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Very High</i>
Community Savings:	<i>Very High</i>

Methodology:

Residential Energy Conservation Ordinance (ECO): It is generally understood that the average person stays in a home for five to seven years. To make a conservative estimate, assume that 25% of existing (pre-2008) homes are turned over between the time of this measure's implementation and 2020, and 75% are turned over between the time of implementation of this measure and 2035. Assume that 40% of owners will implement the energy-saving recommendations of the audit. Average savings are estimated to be 25% for electricity and natural gas. The community and city costs of an ECO program are based on costs for the program in Berkeley, Calif.

Property Assessed Clean Energy: This measure assumes a 15% and 30% participation rate for homes 2020 and 2035, respectively. Savings are only applied to owner-occupied homes. A 25% savings in electricity and natural gas consumption is assumed per home and business based on the past performance of PACE programs and as summarized by the National Resources Defense Council (NRDC). The community and City cost of a PACE program is based on the NRDC paper.

Low-Income Weatherization: The energy savings from low-income weatherization programs such as LIHEAP or CARE are included based on past performance of these programs. According to the state of California, 0.46% of eligible households have been served by a low-income weatherization program. This percentage was applied to Sunnyvale's eligible households per the Housing Element.

Sources:

California Department of Finance. 2008. California Statewide Population.

California Energy Commission. 2010a. Nonresidential Building Energy Performance Rating Disclosure Regulations. Sacramento: CEC.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

City of Sunnyvale. 2009 General Plan Housing Element. Sunnyvale, CA.

Natural Resources Defense Council. 2010. Property Assessed Clean Energy Programs White Paper.
<http://pacenow.org/documents/PACE%20White%20Paper%20May%203%20update.pdf>.

State of California, Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs.
[http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20\(2008\).pdf](http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf).

EC-4 Commercial Energy Efficiency

Establish a regulatory and incentive-based structure that facilitates commercial and industrial energy efficiency and conservation.

Action Items:

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 the building.

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.

EC-4.3. Create an ordinance to facilitate energy efficiency improvements in nonresidential buildings through incentives and regulations that may include energy performance reports, time of sale upgrades, and/or innovative partnerships to reduce energy use.

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.

GHG Assumptions:

	2010	2020	2035
Percentage of businesses sold, leased, or remodeled	0%	25%	60%
Participation rate of properties	0%	35%	60%
PACE commercial participation rate	0%	10%	15%
Average energy reduction per property	0%	25%	25%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	63,490	91,100
GHG Reduction with CCA	0	47,900	60,520

Performance Indicators:

Percentage of commercial properties retrofitted upon sale and percentage of businesses that participate in PACE

Costs and Savings:

City Costs:	<i>High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Very High</i>
Community Savings:	<i>Very High</i>

Methodology:

Energy Conservation Ordinance (ECO): It was assumed that 25% of businesses will participate in, or be subject to, this program between now and 2020 and 60% by 2035. Assume that 35% of owners will implement the energy-saving recommendations of the audit. Average savings are estimated to be 25% for electricity and natural gas. These reductions are exclusive of the cool roof and insulations savings accounted for in the 2008 Title 24 standards for nonresidential alterations. The community and City costs of an ECO program are based on costs for the program in Berkeley, Calif.

Property Assessed Clean Energy (PACE): This measure assumes a 10% and 15% participation rate for homes 2020 and 2035, respectively. Savings are only applied to owner-occupied homes. A 25% savings in electricity natural gas consumption is assumed per home and business based on the past performance of PACE programs and as summarized by the National Resources Defense Council (NRDC). The community and City cost of a PACE program is based on the NRDC paper.

Sources:

California Energy Commission. 2010a. Nonresidential Building Energy Performance Rating Disclosure Regulations. Sacramento: CEC.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

Natural Resources Defense Council. 2010. Property Assessed Clean Energy Programs White Paper. <http://pacenow.org/documents/PACE%20White%20Paper%20May%203%20update.pdf>.

EC-5 Smart Grid

Increase awareness and utilization of real-time energy consumption data and pricing available through PG&E's Smart Meter program.

Action Items:

EC-5.1. Require new construction and major remodels to install interior real-time energy monitors.

EC-5.2. Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.

EC-5.3. Inform the community of metering options, such as online applications and in-home monitors.

GHG Assumptions:

	2010	2020	2035
Existing residential monitoring program participation	1%	50%	75%
New residential monitoring program participation	0%	75%	95%
Existing commercial monitoring program participation	0%	50%	75%
New commercial monitoring program participation	0%	75%	95%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	17,150	26,110
GHG Reduction with CCA	0	10,300	12,050

Performance Indicators:

Percentage of new and existing homes and businesses that participate in monitoring program

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Low-Medium</i>
Community Savings:	<i>Very High</i>

Methodology:

The integration of smart grid technology and implementation of dynamic pricing programs will provide energy users with detailed information about their energy use and the costs of energy. Energy customers will be able to use these technologies to track and monitor energy use in real time to understand the relationship between energy consumption patterns and energy costs. Smart grid technology equips individuals to alter behaviors to use less energy and shift higher energy uses to times when the costs are lowest. Research on consumer energy use and the rate of feedback on those patterns has shown that the more frequently a consumer is reminded of the level/amount of energy they are using, the more they will change their behaviors to consume less energy. Utility companies have demonstrated that by providing instantaneous energy data in addition to monthly utility bills with total energy consumption and costs, consumers are equipped to more effectively manage energy consumption. New tools such as web-based applications or indoor energy monitors provide instantaneous and constant feedback on energy use and have been shown to reduce energy use by an average of 7%. PG&E installed Smart Meters on all customer buildings in 2010 and the first quarter of 2011. This measure estimates that in 2020, 50% of energy customers will reduce their energy use by 7% and that by 2035, 80% of customers will reduce their energy use.

In addition to behavioral changes, the development of new household appliances that can be programmed or timed to operate when energy prices fall below a certain point will also promote energy-saving behaviors. While the widespread availability of these appliances is dependent on the gradual reduction in cost that will result from increased consumer demand and product options, up to an additional 7% energy savings may be achieved for households or businesses that install these smart grid appliances. Requirements for new residential and commercial development to include these appliances will further reduce the community's energy use, and such requirements may yield a larger impact when coupled with incentives to encourage current energy users to purchase smart grid appliances when replacing washers, dryers, dishwashers, and other appliances. The Energy Star program illustrates the phasing of market penetration for energy-efficient appliances and demonstrates the feasible rate of integration of smart grid appliances. The program was launched in 1990, and by 2010, 12% of all homes included Energy Star products. Assuming that smart grid appliances are available within the next few years, we can anticipate similar growth in market penetration to the Energy Star program. The percentage of new buildings to include smart grid appliances by 2020 and 2035 is based on the current number of new buildings that include Energy Star products.

Sources:

Ehrhardt-Martinez, K., K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. American Council for an Energy-Efficient Economy. Report Number E105. <http://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>.

Energy Star. 2008. Clothes Washer Product Snapshot. http://www.energystar.gov/ia/partners/reps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf.

Energy Star. n.d. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialNewConstruction.pdf.

Pike Research. 2010. Smart Appliance Sales. <http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-forecasts-Pike-Research-3290.html> and <http://www.pikeresearch.com/>.

EC-6 "Cool" Roofs and Pavements

Reduce the amount of dark, nonreflective roofing and paving material in order to mitigate the urban heat island effect and reduce energy associated with heating and cooling.

Action Items:

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.

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.

EC-6.3. Commit to using a warm aggregate mix for all asphalt patching, overlay, and reconstruction.

EC-6.4. Consider the lifespan and embedded GHG content of pavement materials for public projects.

GHG Assumptions:

	2010	2020	2035
Percentage of existing crosswalks and parking lots with high albedo materials	0%	15%	50%
Percentage decrease in energy consumption per 1 degree decrease in temperature	2%	2%	2%
Increase in Solar Reflectivity Index	45%	45%	45%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	–	710	2,250
GHG Reduction with CCA	–	470	1,200

Performance Indicators:

All new parking lots, crosswalks, and sidewalks are made of high albedo content

New office, industrial, retail, and services floor area permitted (SunGIS)

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Low</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Medium-High</i>

Methodology:

This measure includes the GHG benefit of cool pavements. Cool pavements retain less heat than traditional pavement materials like black asphalt, causing urban surface temperatures to decrease and creating less demand for air conditioning in buildings. Please note that this measure does not include the GHG impact of cool roofs, which is included in the quantification of the 2008 CALGreen Code (state-mandated).

Sources:

Akbari, Hashem. 2005. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. <http://heatisland.lbl.gov/>.

Pomerantz, Melvin. 2010. EPA Presentation, "Cool Pavements for Cool Communities."

US Environmental Protection Agency. 2005b. Reducing Urban Heat Island Compendium of Strategies: Cool Pavements. <http://www.epa.gov/heatislid/resources/pdf/CoolPavesCompendium.pdf>.

EP-1 Renewable Energy Portfolio

Increase the renewable energy portfolio of electricity delivered to Sunnyvale so that more than 50% of delivered energy comes from renewable sources by 2035.

Action Items:

EP-1.1. Create or join a community choice aggregation (CCA) program to take control of power generation for city residents and businesses.

GHG Assumptions:

	2010	2020	2035
Percentage of customers with light green option	0%	60%	60%
Percentage of customers with dark green option	0%	20%	30%
Light green renewable mix	0%	50%	65%
Dark green renewable mix	0%	100%	100%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	–	–	–
GHG Reduction with CCA	–	233,400	338,420

Performance Indicators:

Percentage of "light green" and "dark green" participants and renewable mix for "light green" and "dark green"

Costs and Savings:

City Costs:	<i>Low-Medium</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

Under this measure, the City would create or participate in a community choice aggregation (CCA) program. The program could follow the structure of Marin Clean Energy by operating as an opt-out program. Under this structure, energy customers in Sunnyvale would automatically be enrolled in the “light green” option. Customers could opt out and receive PG&E’s default renewable energy mix or they could opt in to the “dark green” option and receive 100% renewable energy. The light green option is estimated to achieve a 50% renewable mix by 2020 and a 65% renewable mix by 2035. Based on the current status of the Marin CCA program, this measure assumes that 20% of energy customers would opt out. Of the customers participating in the CCA program, 80% of customers in Sunnyvale would remain in the light green option and 20% would sign up for the dark green option.

Sources:

California Public Utilities Commission (CPUC). 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.

Marin Energy Authority. 2010. Marin Clean Energy Implementation Plan. http://marincleanenergy.info/images/stories/PDF/MEA_Implementation_Plan_Jan_2010.pdf.

EP-2 Local Renewable Energy

Increase the number of renewable energy installations in and available to the community.

Action Items:

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.

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.

EP-2.3. Prevent buildings and additions from shading more than 10% of roofs of other structures.

EP-2.4. Continue to allow and encourage solar facilities above paved parking areas.

EP-2.5. Maintain incentives for alternative energy installations in new and existing development, including solar and small-scale wind turbines.

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.

GHG Assumptions:

	2010	2020	2035
PACE residential participation rate	0%	15%	30%
PACE commercial participation rates	0%	10%	15%
kW of solar installed	5,100	6,800	15,299

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	2,590	33,820	50,240
GHG Reduction with CCA	2,590	20,980	24,670

Performance Indicators:

Residential and nonresidential participation rates

Permitted new square footage of commercial offices, retail and service space, and industry

New residential units receiving building permits (SunGIS)

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Very High</i>
Community Savings:	<i>Very High</i>

Methodology:

This measure includes the anticipated benefit of a Property Assessed Clean Energy (PACE) program or equivalent financing mechanism to the number of solar photovoltaic (PV) and solar hot water systems in Sunnyvale. Based on the performance of existing PACE programs like that of Sonoma County and Palm Desert, it is estimated that 15% of residents will participate in the program by 2020 and 30% by 2035. It is estimated that 10% and 15% of nonresidential establishments will participate by 2020 and 2035, respectively. Of these participants, 80% will install a small-scale solar PV or solar thermal system along with their energy-efficiency retrofit. According to an independent review of nationwide PACE programs, the average residential solar PV system is assumed to be 3.4 kW, based on current installation sizes in the City of Sunnyvale. The average nonresidential solar PV system is assumed to contribute 80% of the establishment's annual energy load.

Community costs are based on the current cost per kW of solar. City cost to establish a PACE program is based on cost estimates from other Bay Area communities.

Sources:

California Department of Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. [http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20\(2008\).pdf](http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf).

California Department of Finance. 2008. California Statewide Population.

California Energy Commission (CEC). 2010a. Nonresidential Building Energy Performance Rating Disclosure Regulations. Sacramento: CEC.

California Solar Initiative. 2011. California Solar Initiative Geographic Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

City of Sunnyvale. 2009 General Plan Housing Element. Sunnyvale, CA.

Go Solar California. 2010. http://www.gosolarcalifornia.org/professionals/2-17-10_CalFIRST_FACT_SHEET.pdf.

Natural Resources Defense Council. 2010. Property Assessed Clean Energy Programs White Paper. <http://pacenow.org/documents/PACE%20White%20Paper%20May%203%20update.pdf>.

WC-1 Water Sources and Efficiency

Decrease the amount of energy needed to filter, transport, and treat water used within Sunnyvale.

Action Items:

WC-1.1. Prepare a feasibility study to expand the City's current recycled water program citywide and improve the quality of recycled water to expand potential uses to industrial facilities or other applications.

WC-1.2. Promote "purple pipe" (reclaimed water) infrastructure in new construction or major renovation in preparation for a growing, usable network.

WC-1.3. Create a purple pipe network for citywide use of recycled water for irrigation and other outdoor purposes.

WC-1.4. Create flexible provisions and encourage residents and businesses to collect rainwater to use for irrigation purposes.

GHG Assumptions:

	2010	2020	2035
Percentage of delivered water from reclaimed source	6.9%	15%	25%
Million gallons of water recycled	455	1,091	2,107

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	230	530

Performance Indicators:

Annual reclaimed water use

Average daily water consumption per capita

Costs and Savings:

City Costs:	<i>Very High</i>
City Savings:	<i>Low</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Low-Medium</i>

Methodology:

The greenhouse gas reduction potential of a greywater system is based on an estimate that local recycled water will increase from 6.9% of the water supply to 15% in 2020 and 25% in 2035. The GHG reduction benefit of this change is calculated using the methodology outlined by CAPCOA. Although this change will result in a lower GHG inventory, the energy reduction benefit will largely occur outside of Sunnyvale and therefore community savings are low-medium.

Sources:

Bay Area Water Supply & Conservation Agency. 2010. Annual Survey and Water Conservation Report Fiscal Year 2008–2009.

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

WC-2 Water Conservation

Reduce indoor and outdoor potable water use in residences, businesses, and industry.

Action Items:

WC-2.1. Require new development to reduce potable indoor water consumption by 30% (Tier 1 CALGreen) and outdoor landscaping water use by 40%.

WC-2.2. Revise development standards to ensure the use of greywater, recycled water, and rainwater catchment systems is allowed in all zones.

WC-2.3. Require new open space and street trees to be drought-tolerant.

WC-2.4. Implement the City's Urban Water Management Plan to facilitate a 20% reduction in per capita water use by 2020.

GHG Assumptions:

	2010	2020	2035
Residential water use reductions (MG)	0	39	106
Nonresidential water use reductions (MG)	0	19	52

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	80	750	990

Performance Indicators:

Gallons per capita per day water consumption

Square footage of permitted new construction (SunGIS)

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Medium</i>
Community Savings:	<i>Very High</i>

Methodology:

This measure calls for the City to require new development to achieve 30% indoor water savings and 40% outdoor water savings consistent with the 2008 CALGreen Code. This requirement would be adopted as a mandatory component of the City's Green Building Code and would occur upon the next update of the City's Code. City costs are anticipated to be low in combination with the enforcement of the City's Green Building Code.

Sources:

Bay Area Water Supply & Conservation Agency. 2010. Annual Survey and Water Conservation Report Fiscal Year 2008–2009.

California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf.

LW-1 Materials Management

Reduce the availability or use of common materials that are not recyclable or that are cost-ineffective to recycle.

Action Items:

LW-1.1. Reduce the use of plastic bags at grocery stores and convenience stores in the community through incentives or requirements.

LW-1.2. Ban the sale or dispersal of disposable, single-use plastic water bottles at public events permitted by the City.

LW-1.3. Ban the use of expanded polystyrene (EPS) take-out containers at restaurants and fast-food facilities.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	Supportive Measure		

Performance Indicators:

N/A

Costs and Savings:

City Costs:	<i>Low-Medium</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

This is a supporting measure for LW-2, Recycling and Composting. The cost and savings to the community are currently unknown for a plastic bag ban.

Sources:

N/A

LW-2 Recycling and Composting

Increase the amount of waste recycled and composted by 1% per year according to the City's Zero Waste Strategic Plan.

Action Items:

LW-2.1. Require multi-family homes to participate in the City's Multi-family Recycling Program.

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.

GHG Assumptions:

	2010	2020	2035
Disposal rate (PPD)	3.5	1.5	0.5
Total tons disposed	85,305	46,879	15,877
Total tons diverted	18,901	66,794	122,098

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	14,310	53,960	96,190

Performance Indicators:

Per capita disposal rates or overall diversion rate

Costs and Savings:

City Costs:	<i>Medium</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Medium</i>
Community Savings:	<i>Minimal</i>

Methodology:

The GHG reduction benefit of this measure is based on the assumption that waste per person per day will decrease to 1.5 pounds per day (PPD) in 2020 and 0.5 PPD in 2035. The cost of this measure to the community is unknown until the Zero Waste Strategic Plan is complete.

Sources:

CalRecycle. 2011. Jurisdiction Diversion/Disposal Rate Summary. <http://www.calrecycle.ca.gov/LGCentral/Tools/MARS/DrmcMain.asp>.

OR-1 Lawn and Garden Equipment

Encourage residents and businesses to use efficient lawn and garden maintenance equipment or to reduce the need for landscape maintenance through native planting.

Action Items:

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.

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.

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.

GHG Assumptions:

	2010	2020	2035
Percentage of leaf blowers exchanged	0%	25%	50%
Number of leaf blowers exchanged	0	1,434	2,869
Percentage of lawnmowers exchanged	0%	25%	50%
Number of lawnmowers exchanged	0	391	782

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	30	100

Performance Indicators:

Percentage of lawnmowers and leaf blowers exchanged

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Medium</i>
Community Savings:	<i>Minimal</i>

Methodology:

The GHG reduction potential of switching leaf blowers and lawnmowers to electric from gasoline or diesel will result in decreased fuel consumption and air pollution but will also result in a small increase in electricity use to power this equipment.

Sources:

Bay Area Air Quality Management District (BAAQMD). 2010b. History of the Air District: 1995–2000. <http://www.baaqmd.gov/Divisions/Communications-and-Outreach/News-Media-and-Features/History-of-Air-District-2005/1995–2000.aspx>.

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Air Resources Board (CARB). 2007. Off-Road Software.

OR-2 Construction Equipment

Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

Action Items:

OR-2.1. Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five 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.

OR-2.2. Construction equipment must be maintained per manufacturer's specifications.

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 of on-site generators by connecting to grid electricity or utilizing solar-powered equipment.
- d. Limit heavy-duty equipment idling time to a period of three minutes or less, exceeding CARB regulation minimum requirements of five minutes.

GHG Assumptions:

	2010	2020	2035
Percentage of equipment that is hybrid, CNG, electric, or biodiesel	0%	40%	65%
Percentage of equipment that meets City idling restrictions	0%	50%	50%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	7,400	13,720

Performance Indicators:

Percentage of equipment that is fuel-efficient and/or alternatively fueled

Idling restrictions

Costs and Savings:

City Costs:	<i>Minimal</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

Reducing maximum idling times from the state requirement of five minutes to three minutes will result in approximately 40% less fuel used for idling equipment. It is estimated that idling accounts for 5% of all fuel used in construction equipment. Additionally, voluntary conversion of construction equipment from diesel to CNG, electric, or biodiesel will result in fewer GHG emissions.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

California Air Resources Board (CARB). 2007. Off-Road Software.

CA-1 Community Outreach and Involvement

Educate and involve the community regarding actions they can do at home to reduce energy, water, waste, and fuel consumption.

Action Items:

CA-1.1. Create a structure or partner with other groups of volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.

CA-1.2. Provide regular communication with schools, businesses, faith groups, community members, and neighborhood groups to increase participation in the city's progress toward sustainability.

CA-1.3. Develop and encourage a mechanism for neighborhoods to share equipment and resources to improve sustainability.

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.

CA-1.5. Develop and implement a competitive greenhouse gas reduction program with an award component between groups of citizens in the city.

CA-1.6. Use sustainability initiatives within City operations to educate the community on ways to achieve sustainability by example.

CA-1.7. Actively promote the use of alternative modes of transportation as safe modes of travel. When applicable, promote viable programs sponsored by 511.org, the BAAQMD, and other recognized agencies on the City's

website and publications.

CA-1.8. Through selected projects and efforts to improve City operations, demonstrate how sustainability efforts are possible and successful.

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.

CA-1.10. Use the City's Sustainability Commission and coordinator as a structure to coordinate with other groups of volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.

CA-1.11. Actively engage with Sunnyvale businesses to identify areas for GHG reduction and financial savings.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	Supportive Measure		

Performance Indicators:

Number of community events related to sustainability

Costs and Savings:

City Costs:	<i>Medium-High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

Community outreach is essential to the implementation of the CAP goals and measures; however, outreach does not result in a direct reduction of GHG emissions.

Sources:

N/A

CA-2 School Education and Involvement

Educate local schoolchildren about climate change and ways that they and their families can reduce greenhouse gas emissions.

Action Items:

CA-2.1. Recommend and advocate schools to use the Bay Area Air Quality Management District curriculum or other programs for local schoolteachers to teach children about climate change, greenhouse gas emissions, and local actions.

CA-2.2. Continue to provide and improve the bicycle driver education program for elementary, middle, and high school students.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	Supportive Measure		

Performance Indicators:

Number of school outreach events conducted

Costs and Savings:

City Costs:	<i>Medium</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

Community outreach is essential to the implementation of the CAP goals and measures; however, outreach does not result in a direct reduction of GHG emissions.

Sources:

N/A

LUP-1 Parking

Reduce the amount of free or unrestricted parking available within the city to promote alternative modes of transportation and avoid unnecessary vehicle circulation.

Action Items:

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.

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.

LUP-1.3. Implement parking management tools for residential uses such as decreased or flexible standards, unbundled parking, and shared parking plans.

LUP-1.4. Establish parking meters throughout downtown Sunnyvale to optimize parking availability and reduce unnecessary vehicle circulation.

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.

LUP-1.6. Designate street parking stalls in the vicinity of key commercial and multi-family residential locations for efficient or alternatively fueled vehicles.

GHG Assumptions:

	2010	2020	2035
Reduction in parking provision compared to a parking generation rate	0%	10%	10%
Monthly parking cost due to unbundling, residential	–	\$10	\$10

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	4,970	5,350

Performance Indicators:

Percentage reduction in parking provision compared to a parking generation rate

\$10 monthly parking cost

Costs and Savings:

City Costs:	<i>Medium</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>Unknown</i>

Methodology:

This measure includes the GHG benefit of LUP-1.2 (parking requirements) and LUP-1.3 (unbundle parking costs). The remaining measures are included in the City's Transportation Demand Forecast model or are not quantifiable.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

LUP-2 Transit-Oriented, Higher Density, Mixed-Use Development

Facilitate development in designated core and corridor areas that is transit-oriented, higher density, and mixed-use.

Action Items:

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-2.2. Continue to identify underutilized areas that can support higher-density housing and mixed-use development.

LUP-2.3. Facilitate the development of affordable housing near transit.

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.

LUP-2.5. Continue to allow for the development of live/work spaces in commercial zoning districts and mixed-use residential zoning districts.

GHG Assumptions:

	2010	2020	2035
Percentage of new housing that is deed-restricted below market rate	0%	15%	15%
VMT reduction from increased density	0%	2%	2%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	14,010	15,090

Performance Indicators:

Percentage of new housing units deed-restricted below market rate

Costs and Savings:

City Costs:	<i>Unknown</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

This measure includes the GHG benefit of increased density and a greater amount of below-market-rate housing. Density reductions are based on citywide changes in dwelling units per acre according to the City's Transportation Demand Forecast model. Finally, the benefit of below-market-rate housing is based on the assumption that 15% of new housing units in Sunnyvale will be deed-restricted below market rate.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

LUP-3 Local Commerce and Food

Increase the amount of locally generated and consumed goods in order to decrease the need for travel and promote healthier communities.

Action Items:

LUP-3.1. Amend the Zoning Code to allow small-scale, commercial urban farms to operate in residential areas.

LUP-3.2. Ensure that every residential portion of mixed-use developments has opportunities for growing produce locally.

LUP-3.3. Establish community gardens for public use.

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.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	Supportive Measure		

Performance Indicators:

N/A

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Low</i>

Methodology:

This measure does not have a quantifiable VMT or GHG reduction benefit.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

LUP-4 Jobs/Housing Balance

Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel between residences and places of work.

Action Items:

LUP-4.1. Support the retention and expansion of local anchor and growth industries.

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.

GHG Assumptions:

	2010	2020	2035
Jobs-to-housing ratio	1.39	1.50	1.65
VMT reduction from increased diversity of land uses	0.0%	0.2%	0.2%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	900	970

Performance Indicators:

Jobs-to-housing ratio

Costs and Savings:

City Costs:	<i>Unknown</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>High</i>

Methodology:

The benefit of destination and land use diversity is applied to mixed-use areas such as downtown Sunnyvale and Lawrence Station vehicle miles. These areas have a beneficial jobs/housing balance, a greater distribution of services, and higher density. The GHG benefit of this measure is shared between LUP-2 (Transit-Oriented, Higher Density, Mixed-Use Development), LUP-4 (Jobs/Housing Balance), and LUP-5 (Distributed Services).

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

LUP-5 Distributed Services

Encourage the wider distribution of commonly used facilities and services in order to reduce the need for or length of vehicular trips to and from places of work and residence.

Action Items:

LUP-5.1. Encourage the establishment and even distribution of neighborhood-serving facilities such as day-care providers, banking/ATM locations, markets, and drugstores in existing residential, commercial, and industrial areas in order to reduce the need for vehicle trips.

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, and shopping.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	See LUP-4		

Performance Indicators:

New residential development permits issued

Additional commercial and industrial square footage

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>Unknown</i>

Methodology:

Quantifying the GHG reduction benefit of distributed services is difficult to separate from diversity of land uses and other transportation measures and has therefore been quantified as part of other transportation and land use measures.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

CTO-1 Bicycle, Pedestrian, and Transportation Design Elements

Create streets and connections that facilitate bicycling, walking, and transit use throughout the city.

Action Items:

CTO-1.1. Incorporate the provisions of AB 1358, the California Complete Streets Act of 2008, into roadway design, construction, and maintenance activities.

CTO-1.2. Implement the street space allocation policy (RTC 8-085, April 28, 2009) in coordination with road reconstruction or resurfacing projects to provide road configurations that accommodate all travel modes.

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.

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.

CTO-1.5. Improve bicycle facilities and perceptions of comfort through pavement marking/coloring, physical separation, specialized signs and markings, and other design elements.

CTO-1.6. Require sidewalks to be a minimum of 6 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 volumes of pedestrian traffic.

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 the Valley Transportation Authority, Peninsula Corridor Joint Powers Board, Advisory Committee on Accessibility, and others to establish the best places for these locations.

GHG Assumptions:

	2010	2020	2035
VMT reduction from improved bike and pedestrian network	0%	1%	1%
Commute to work bicycle mode share	1%	2%	2%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	4,070	4,380

Performance Indicators:

Miles of bike lanes and sidewalks installed

Costs and Savings:

City Costs:	<i>Very High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Low</i>
Community Savings:	<i>Very High</i>

Methodology:

Providing a pedestrian access network to link areas within the city encourages people to walk instead of drive. This mode shift results in people driving less and thus a reduction in VMT.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

City of Sunnyvale. 2006. Bicycle and Pedestrian Master Plan. <http://sunnyvale.ca.gov/Portals/0/Sunnyvale/DPW/Transportation/SunnyvaleBicyclePlan2006.pdf>

CTO-2 Bicycle, Pedestrian, and Transportation Travel Operations

Prioritize safe, efficient, and convenient access for non-automotive travel to destinations in and outside of Sunnyvale.

Action Items:

CTO-2.1. Require public areas and new development to provide bicycle parking consistent with the Valley Transportation Authority Bicycle Technical Guidelines, as amended.

CTO-2.2. Require secure bicycle parking at public and large private events.

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.

CTO-2.4. Fully fund the City's bicycle and pedestrian improvement plans for completion by 2035.

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.

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.

CTO-2.7. Support business efforts to plan and implement a bike-sharing program for major commercial and industrial areas.

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO _{2e})	Supportive Measure		

Performance Indicators:

Number of bicycle support facilities

Miles of bikeways

Costs and Savings:

City Costs:	<i>Very High</i>
City Savings:	<i>Low</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Low-Medium</i>

Methodology:

Providing infrastructure and facilities are both essential to facilitate non-automotive travel in Sunnyvale. Because the provisions of both are essential, the GHG reduction benefit of this measure cannot be quantified separately from CTO-1.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

CTO-3 Transit

Facilitate the use of public and private transit such as buses, Caltrain, Amtrak, and shuttles to and from Sunnyvale and within the city.

Action Items:

CTO-3.1. Continue sponsoring projects to provide transit rider amenities at bus stops and rail stations.

CTO-3.2. Work with the Valley Transportation Authority (VTA) and neighboring jurisdictions to provide transit priority signal timing in order to decrease travel time.

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.

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.

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.

GHG Assumptions:

	2010	2020	2035
Percentage of new development participating in GreenTRIP program	0%	80%	80%
Minimum VMT reduction from GreenTRIP program participants	0%	30%	30%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO _{2e})	0	5,920	19,940

Performance Indicators:

VTA transit ridership in Sunnyvale

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Low</i>
Community Savings:	<i>Low</i>

Methodology:

The VMT reduction benefit of these measures are incorporated into the City's travel demand forecast model and to avoid double counting, components of this measure have been listed as a supporting measure.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

CTO-4 Commute Programs

Reduce single-occupant vehicle trips to major employers (100 employees or more) located in Sunnyvale.

Action Items:

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.

CTO-4.2. Create a TDM program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.

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.

CTO-4.4. Explore programs to encourage large employers to hire Sunnyvale residents.

GHG Assumptions:

	2010	2020	2035
Reduction in VMT from telecommuting	0	2,000,306	2,296,092
Reduction in VMT from ride-share program	0	5,000,764	5,740,230

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO _{2e})	0	5,420	5,840

Performance Indicators:

Participation in commute trip reduction programs

Costs and Savings:

City Costs:	<i>Low-Medium</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Medium</i>

Methodology:

A commute trip reduction program is a voluntary, multi-strategy program that encompasses a combination of individual measures such as transit fare subsidies, ride-share programs, parking permit programs, and alternative work schedules, among other opportunities. The quantification of this measure estimates that all employees within the Moffett Park Specific Plan would be eligible to participate, and approximately 25% of employees in other areas of the city would be likely participants.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

CTO-5 School Commutes

Encourage carpooling, bicycling, walking, and transit access to elementary, middle, and high schools so that the number of car trips is no more than 50% of the number of students at any school.

Action Items:

CTO-5.1. Support the creation of walking school bus programs in coordination with schools and parent organizations.

CTO-5.2. Encourage schools to link employees and guardians of students with an online system such as 511.org that provides carpool matching.

CTO-5.3. Continue to implement a Safe Routes to School program for increased bicycle and pedestrian safety to and from schools.

GHG Assumptions:

	2010	2020	2035
Reduction in school commute-related VMT	–	35%	50%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	1,250	2,220

Performance Indicators:

Commute to school mode share

Costs and Savings:

City Costs:	<i>High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Low</i>
Community Savings:	<i>Low-Medium</i>

Methodology:

The City's Bicycle Master Plan identified range estimates of current bike to school commute behaviors at approximately 5%. This measure estimates the number of vehicle trips associated with school pickups and drop-offs and sets a goal to achieve the number of car trips that is no more than 20% of the number of students at any school.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

City of Sunnyvale. 2006. Bicycle Master Plan. <http://sunnyvale.ca.gov/Portals/0/Sunnyvale/DPW/Transportation/SunnyvaleBicyclePlan2006.pdf>.

US Census Bureau. 2011. Profile of General Population and Housing Characteristics: 2010, City of Sunnyvale, CA.

OVT-1 Clean Alternative Motor Vehicles and Fuels

Promote the use of clean alternative motor vehicles and fuels to reduce emissions from vehicular travel.

Action Items:

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.

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.

OVT-1.3. Require sufficient electrical service in the garages/parking facilities of new residential development to support electric vehicle charging.

OVT-1.4. Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.

OVT-1.5. Collaborate with taxi franchises to use low-emissions vehicles such as hybrids, compressed natural gas vehicles, biodiesel vehicles, or electric vehicles.

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.

OVT-1.7. Facilitate new fueling stations that offer alternative fuels.

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.

GHG Assumptions:

	2010	2020	2035
NEVs in operation	0	1,500	2,500
New electric vehicle charging stations	0	2,660	5,470

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	7,410	18,820
GHG Reduction with CCA	0	7,860	19,980

Performance Indicators:

Number of NEVs in operation and number of parking spaces designated for EV or clean fuel vehicles

Square footage of new commercial and industrial development

Costs and Savings:

City Costs:	<i>High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Medium-High</i>
Community Savings:	<i>Very High</i>

Methodology:

This measure quantifies the VMT and fuel savings impacts of expanded use of electric vehicles through the installation of public and private electric vehicle charging stations. It is anticipated that approximately 2% of all new parking spaces will be installed with electric vehicle charging stations. NEVs are also included in this measure and are an effective form of transportation for short trips and on appropriate streets. It is estimated that 800 households will have NEVs by 2020 and will reduce VMT from traditional vehicles by approximately 12%.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

OVT-2 Car Sharing

Promote the use of car sharing in Sunnyvale in order to establish and maintain at least one viable car-share operation within the city by 2020.

Action Items:

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.

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.

GHG Assumptions:

	2010	2020	2035
VMT reduction	0.00%	0.40%	0.40%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO _{2e})	0	1,810	1,950

Performance Indicators:

Number of car-share operations or vehicles

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Low</i>
Community Savings:	<i>Medium</i>

Methodology:

The increased availability and participation in car-sharing programs has been found to decrease VMT and even car ownership. It is estimated that the expansion of car-sharing programs will result in an approximate 0.4% decrease in VMT.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

OVT-3 Circulation Efficiency

Improve the flow and efficiency of vehicular traffic throughout the city to avoid idling and reduce fuel consumption.

Action Items:

OVT-3.1. Increase signal coordination as warranted to facilitate traffic flow along arterials and major collectors.

OVT-3.2. Educate and enforce idling restrictions associated with delivery trucks and school pickups and drop-offs.

GHG Assumptions:

	2010	2020	2035
Reduction in idling times through enforcement and education		40%	40%

GHG Reduction:

	2010	2020	2035
GHG Reduction (MTCO ₂ e)	0	4,110	4,180

Performance Indicators:

Reduction in vehicle idling times

Vehicle miles traveled on weekdays

Costs and Savings:

City Costs:	<i>High</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>

Community Savings:	<i>High</i>
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Methodology:

Continuing to improve and renovate streets to accommodate all transportation user modes will provide a safer pedestrian environment and encourage residents to make trips by foot or other alternative modes instead of by car. This analysis estimates that traffic calming features will encourage increased walking, resulting in a VMT reduction of 0.3%.

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.

A-1 Regional Coordination

Participate in regional efforts such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC) to analyze and prepare for the impacts of climate change in the Bay Area.

Action Items:

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.

Performance Indicators:

Staff reports to Council every year on adaptation efforts

Costs and Savings:

City Costs:	<i>Minimal</i>
City Savings:	<i>Minimal</i>
Community Costs:	<i>Minimal</i>
Community Savings:	<i>Minimal</i>

Methodology:

N/A

Sources:

N/A

A-2 Preparedness

Ensure that Sunnyvale is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations such as seniors.

Action Items:

A-2.1. Regularly train and inform the Department of Public Safety, Office of Emergency Services on potential climate change risks and hazards.

A-2.2. Update the City Emergency Plan and Emergency Preparedness Workbook to address climate change impacts.

Performance Indicators:

One training session every two years

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>Unknown</i>

Methodology:

N/A

Sources:

N/A

A-3 Adaptive Planning

Integrate potential climate change impacts into local planning documents and processes.

Action Items:

A-3.1. Analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.

A-3.2. Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.

Performance Indicators:

N/A

Costs and Savings:

City Costs:	<i>Unknown</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>Unknown</i>

Methodology:

N/A

Sources:

N/A

A-4 Monitoring

Monitor climate change science and policy and regularly inform stakeholders of new information.

Action Items:

A-4.1. Dedicate a page of the City's website to climate change and climate change adaptation.

A-4.2. On a regular basis, assess adaptation efforts of the City, region, and state and identify goals or gaps to be addressed.

Performance Indicators:

N/A

Costs and Savings:

City Costs:	<i>Low</i>
City Savings:	<i>Unknown</i>
Community Costs:	<i>Unknown</i>
Community Savings:	<i>Unknown</i>

Methodology:

N/A

Sources:

N/A

APPENDIX C



BAAQMD COMPLIANCE

The City of Sunnyvale developed this Climate Action Plan (CAP) to meet the requirements of the Bay Area Air Quality Management District's (BAAQMD) criteria for a Qualified Greenhouse Gas Reduction Strategy as defined in the BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines. The City's Climate Action Plan follows both the state CEQA Guidelines and BAAQMD's guidelines by incorporating the standard elements of a Qualified GHG Reduction Strategy into the CAP.

BAAQMD COMPLIANCE

The City of Sunnyvale developed this Climate Action Plan (CAP) to meet the requirements of the Bay Area Air Quality Management District's (BAAQMD) criteria for a Qualified Greenhouse Gas Reduction Strategy as defined in the BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines. These guidelines were updated in 2010 in response to the State of California's amendment to the state CEQA Guidelines through Senate Bill (SB) 97. SB 97 requires all projects subject to CEQA to analyze and mitigate the greenhouse gas (GHG) emissions that will occur.

The purpose of the BAAQMD CEQA Air Quality Guidelines is to assist lead agencies in evaluating the air quality impacts of proposed projects and plans in the San Francisco Bay Area Air Basin. The guidelines were updated to establish thresholds of significance for impacts related to GHG emissions to be consistent with the requirements of CEQA. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project's impact on GHG emissions is less than significant if it is in compliance with a Qualified Greenhouse Gas Reduction Strategy.

The City's CAP follows both the State CEQA Guidelines and BAAQMD's guidelines by incorporating the standard elements of a Qualified GHG Reduction Strategy into the CAP. The standard elements of a Qualified GHG Reduction Strategy include the following steps:

- 1) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.
- 2) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable.
- 3) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- 4) Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- 5) Monitor the plan's progress.
- 6) Adopt the greenhouse gas reduction strategy in a public process following environmental review.

The remainder of this appendix describes in detail how the City's CAP has been developed to satisfy the requirements of the BAAQMD's guidelines on the standard elements of a Qualified GHG Reduction Strategy and will allow future development projects to determine that a project has a less than significant impact on GHG emissions so long as it is in compliance with the City's CAP.

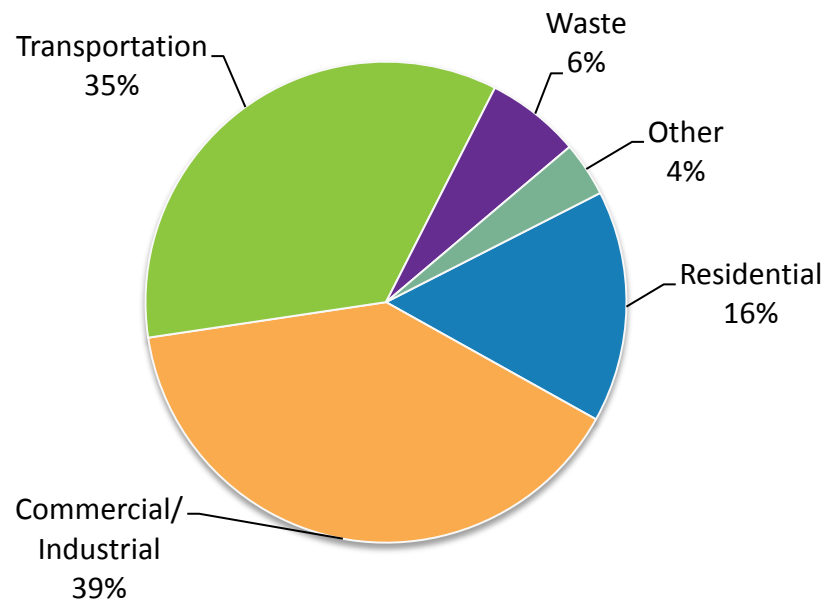
GHG EMISSIONS INVENTORY

The first component of a Qualified GHG Reduction Strategy is to conduct an inventory of GHG emissions within a specified geographic boundary. The City of Sunnyvale's GHG inventory utilizes a baseline year of 2008 to inventory carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) generated from activities by the Sunnyvale community.

The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use and direct process emissions related to water and wastewater, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt-hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in Sunnyvale. In 2008, the City of Sunnyvale emitted approximately 1,270,170 metric tons of carbon dioxide equivalents (MTCO₂e) (see **Table C-1** and **Figure C-1**).

TABLE C-1 – 2008 COMMUNITY-WIDE BASELINE EMISSIONS BY SECTOR

2008 Baseline Greenhouse Gas Emissions	MTCO ₂ e	Percentage of Total
Residential	198,140	16%
Commercial/Industrial	502,210	39%
Transportation	442,610	35%
Community Waste	76,970	6%
Landfill Gas	3,600	<1%
Water	6,870	1%
Off-Road	37,830	3%
Caltrain	1,940	<1%
Total	1,270,170	100%

FIGURE C-1 – 2008 BASELINE GHG EMISSIONS BY SECTOR

Stationary source emissions have also been examined in this emissions inventory. Stationary sources are defined as any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food processing plants, and other heavy industrial sources. The stationary sources of emissions for the City of Sunnyvale total 50,660 MTCO₂ in 2007, as reported by the BAAQMD in the 2007 Source Inventory of Bay Area Greenhouse Gas Emissions. **Table C-2** shows the list of stationary source emissions located in Sunnyvale.

TABLE C-2 – SUNNYVALE LARGE STATIONARY EMITTERS

Source	MTCO ₂ e
Lockheed Martin Corporation	18,630
City of Sunnyvale/Public Works	14,200
City of Sunnyvale Water Pollution Control	2,350
Northrop Grumman Systems Corporation	7,350
Spansion LLC	4,560
Onizuka Air Force Base	3,570
TOTAL	50,660

Stationary source emissions are included in the GHG emissions reduction strategy for information purposes only, as stationary source emissions are most effectively addressed and regulated by the BAAQMD or through federal and state programs. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the City's control; therefore, stationary source emissions are excluded from all further discussions of the inventory for the purpose of setting accurate emissions reduction targets.

GHG EMISSIONS PROJECTIONS

The basis for all growth scenarios is a business-as-usual (BAU) projection. The BAU projection forecasts emissions to reflect the City's growth projections without regulatory or technical intervention to reduce GHG emissions. The BAU projection is based on population, housing, employment, and vehicle miles traveled projections for 2020 and 2035, as shown in **Table C-3**. The population, housing, and employment forecasts come from the City's General Plan, while VMT projections are derived from the Sunnyvale Travel Demand Forecast Model.

TABLE C-3 – SUNNYVALE COMMUNITY GROWTH INDICATORS

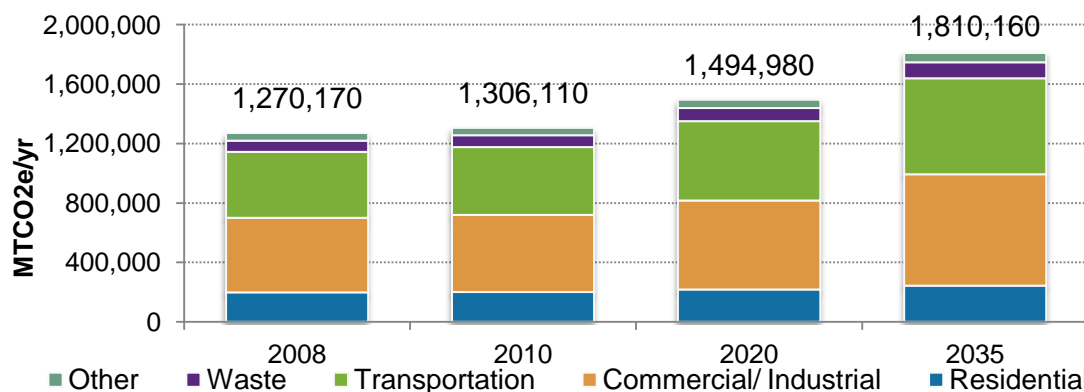
	2008	2010	2020	2035	PERCENTAGE CHANGE
Population	133,110	135,100	145,020	159,910	20%
Households	54,130	55,050	59,660	66,570	23%
Jobs	73,630	76,320	89,750	109,900	49%
Service Population	206,740	211,420	234,770	269,810	31%

These indicators are then applied to the 2008 GHG emissions inventory to determine a BAU growth scenario. Under the BAU scenario, community-wide emissions will grow by approximately 18% by the year 2020 to 1,494,980 MTCO₂e and by 43% by 2035 to 1,810,160 MTCO₂e, as shown in **Table C-4** and **Figure C-2**.

TABLE C-4 – SUNNYVALE COMMUNITY GHG EMISSIONS FORECAST

Sector	Source	2008 Baseline	2010 Estimate	2020 Forecast	2035 Forecast
Residential	Electricity	84,850	86,160	93,020	104,350
	Natural Gas	113,290	115,040	124,200	139,320
Commercial/ Industrial	Electricity	387,700	399,380	463,240	578,680
	Natural Gas	114,510	117,950	136,820	170,910
Transportation	VMT	442,610	457,680	533,070	646,150
Landfilled Waste	Commercial	51,570	53,120	61,620	76,970
	Residential	25,400	25,790	27,850	31,240
Landfill Gas	Landfill Gas	3,600	3,460	2,830	2,100
Water	Gallons	6,870	7,000	7,730	8,960
Off-Road	Construction	34,930	35,620	39,310	45,580
	Lawn & Garden	2,900	2,940	3,180	3,560
Caltrain	Trips	1,940	1,970	2,110	2,340
TOTAL		1,270,170	1,306,110	1,494,980	1,810,160
Percentage Change Since Baseline			3%	18%	43%

* The 2010 and 2020 business-as-usual growth forecasts are linear interpolations of the growth between 2008 and 2035 under the adopted General Plan growth scenario

FIGURE C-2 – BUSINESS-AS-USUAL GHG FORECAST, 2008–2035*

* Other sources include water and wastewater, landfill gas, and off-road emissions representing less than 5% of the inventory.

In addition to AB 32, California has adopted and started to implement several state-level programs that will impact local GHG emissions. In order to effectively determine the emissions reductions that will need to be implemented at the local level to meet the City's emissions reduction target, the impact of state-level programs has been incorporated into an adjusted business-as-usual (ABAU) forecast. The state-level programs included in this adjusted forecast include the Renewables Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative rebates, and the implementation of the Clean Car Fuel Standard, commonly referred to as the Pavley standards. The impact of these state programs (shown in **Table C-5**) will play a critical role in helping Sunnyvale to achieve the emissions reduction target.

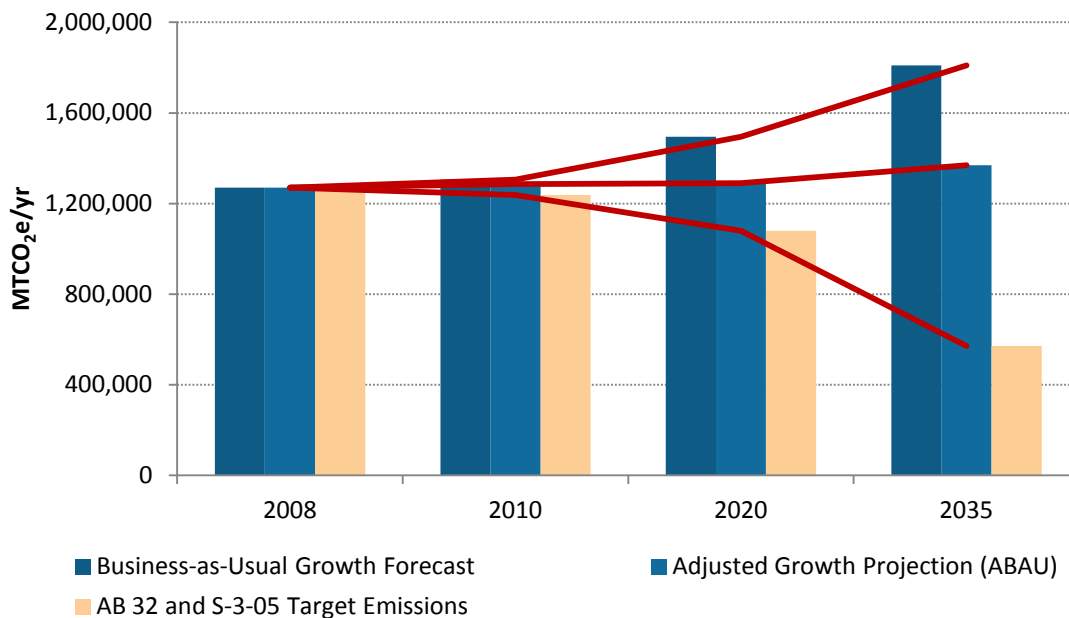
TABLE C-5 – STATE REDUCTIONS SUMMARY

	2008	2010	2020	2035
BAU Forecast	1,270,170	1,306,110	1,494,980	1,810,160
BAU Forecast Growth Percentage		3%	18%	43%
Pavley I – Clean Car Fuel Standard	–	0	-81,150	-159,460
Renewables Portfolio Standard	–	-19,700	-90,800	-173,690
CALGreen & 2008 Title 24 Standards	–	0	-31,210	-105,400
Caltrain Electrification	–	0	-1,900	-2,100
Total State/Regional Reductions	–	-19,700	-205,060	-440,650
Adjusted BAU Forecast	1,270,170	1,286,410	1,289,920	1,369,510
ABAU Forecast Growth Percentage	0%	1%	2%	8%

GHG EMISSIONS REDUCTION TARGET

After state and regional efforts are factored into Sunnyvale's growth forecast, the City's challenge to meet the GHG reduction targets of 15% below baseline levels by 2020 and progress toward the 80% below 1990 levels by 2050 will be fulfilled by the CAP. **Figure C-3** identifies the gap between the City's GHG emissions forecast and the GHG reduction targets if policies and programs are not developed to reduce GHG emissions.

FIGURE C-3 – GREENHOUSE GAS EMISSIONS FORECASTS AND STATE REDUCTION TARGETS



GHG REDUCTION MEASURES

The GHG reduction measures included in this CAP demonstrate the City's ability to reach the GHG reduction target of 15% below baseline levels by 2020. Emissions reductions were quantified for three different years: 2010, 2020, and 2035. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has already made in implementing measures within the CAP, while the 2020 and 2035 emissions reductions are the potential reductions that will be achieved through the implementation of these measures over the next several years. The GHG reduction strategies are separated by goal or topic area to correspond with the sectors and sources of GHG emissions as follows:



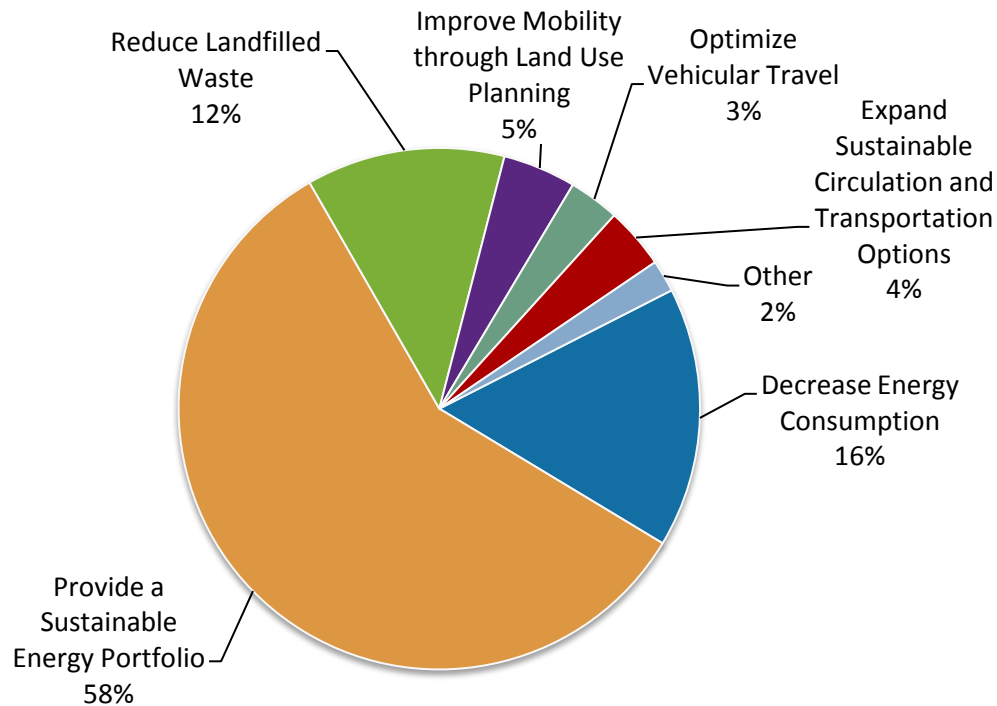
It is important to identify how the City will meet or exceed the minimum GHG reduction target of 15% below baseline levels by 2020 to ensure the City can utilize the CAP as a Qualified GHG Reduction Strategy for use in environmental review of projects. This Plan identifies a clear path to allow the City to exceed the community-wide GHG reduction target of 15% below baseline levels by 2020.

The reduction measures included in this Plan are a diverse mix of regulatory and incentive-based programs. The reduction measures aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. In total, existing actions, state programs, and GHG reduction measures in this Plan will reduce GHG emissions in the City of Sunnyvale in 2020 by 438,050 MTCO₂e (see **Table C-6**), more than double the required GHG reductions necessary to meet AB 32 targets. **Figure C-4** identifies the GHG reductions to be achieved by 2020 by goal.

TABLE C-6 – GHG REDUCTION SUMMARY BY TOPIC (WITH EP-1)

Sector	2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Open Space and Urban Forestry	-310	-780
Decrease Energy Consumption	-70,680	-104,610
Provide a Sustainable Energy Portfolio	-254,380	-363,090
Decrease Water Consumption	-980	-1,520
Reduce Landfilled Waste	-53,960	-96,190
Reduce Off-Road Equipment Emissions	-7,430	-13,820
Increase and Retain Awareness of Sustainability Issues	0	0
Improve Mobility through Land Use Planning	-19,880	-21,410
Expand Sustainable Circulation and Transportation Options	-16,660	-32,380
Optimize Vehicular Travel	-13,770	-26,110
Total Reductions	-438,050	-659,910

FIGURE C-4 – 2020 EMISSIONS REDUCTIONS BY GOAL, MTCO₂E (WITH EP-1)

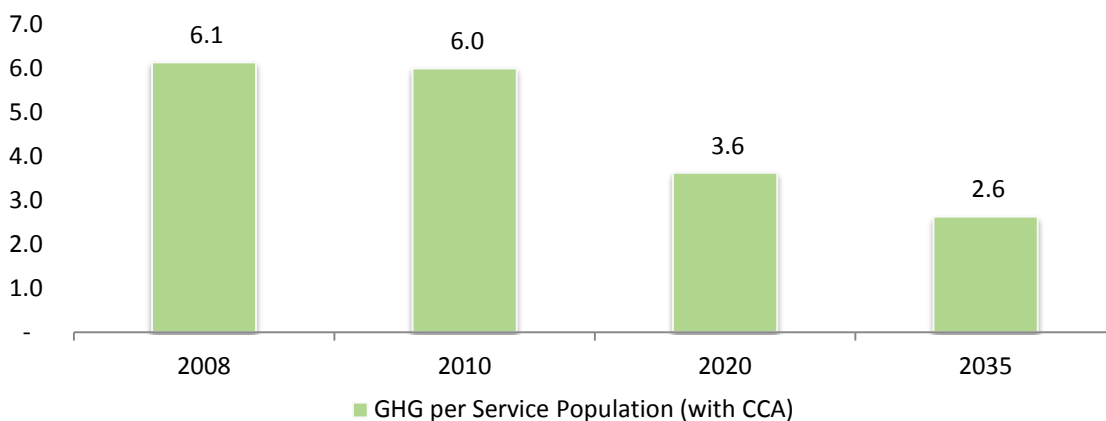


Measure EP-1 directs the City of Sunnyvale to create or join a community choice aggregation program. Since the City's current GHG reduction strategy relies on this strategy to account for nearly half of the GHG reductions, an analysis has also been completed to demonstrate that the City will still meet the 15% reduction target by 2020 if this program is not implemented. **Table C-7** shows the GHG impact of each goal area if Measure EP-1 is not implemented by 2020. If EP-1 is not implemented, the GHG benefit of measures related to electricity will increase.

TABLE C-7 – GHG REDUCTION SUMMARY BY TOPIC (WITHOUT EP-1)

Sector	2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Open Space and Urban Forestry	-350	-870
Decrease Energy Consumption	-95,140	-156,500
Provide a Sustainable Energy Portfolio	-33,820	-50,240
Decrease Water Consumption	-980	-1,520
Reduce Landfilled Waste	-53,960	-96,190
Reduce Off-Road Equipment Emissions	-7,430	-13,820
Increase and Retain Awareness of Sustainability Issues	0	0
Improve Mobility through Land Use Planning	-19,880	-21,410
Expand Sustainable Circulation and Transportation Options	-16,660	-32,380
Optimize Vehicular Travel	-13,330	-24,950
Total Reductions	-241,550	-397,880

Implementation of the CAP by 2020 will exceed state recommendations and BAAQMD threshold requirements for developing a Qualified GHG Reduction Strategy by approximately 15%. As shown in **Figure C-5**, through the implementation of this Plan, the City's GHG emissions will decrease from 6.1 MTCO₂e per person per year in 2008 to 2.6 MTCO₂e per person per year in 2035.

FIGURE C-5 – GHG EMISSIONS PER SERVICE POPULATION (MTCO₂E) (WITH EP-1)

In addition to quantifying the emissions reductions associated with each strategy in the CAP, BAAQMD guidance recommends that the City clearly specify the measures within the CAP applicable to new construction projects to demonstrate compliance with the City's GHG emissions reduction strategy and determine that the project's GHG emissions are less than significant. To ensure that each new construction project complies with the City's CAP, the City will develop a checklist to be submitted by the project applicant following CAP adoption.

IMPLEMENTATION AND MONITORING

To ensure the timely implementation of the City's CAP, the City will identify staff to coordinate program implementation, track implementation of GHG reduction strategies and progress toward GHG reduction targets, and prepare annual reports to the City Council on CAP implementation and progress. To assist staff, the City will develop an implementation and monitoring tracking tool that identifies the major implementation milestones and the necessary actions to be taken for each measure. The tool enables the City to quickly update the GHG emissions inventory and streamline the reporting of CAP implementation on an annual basis. The monitoring tool also outlines the necessary procedures to update the inventory and reduction measures, as needed. This tool will serve as the primary instrument in measuring the City's progress toward achieving emissions reduction targets and to ensure timely implementation occurs.

PUBLIC PROCESS AND ENVIRONMENTAL REVIEW

The final requirement of a Qualified GHG Reduction Strategy is to adopt the Plan through a public hearing process following environmental review. The City has involved numerous stakeholders throughout the development of the CAP. The CAP will undergo environmental review as part of the public hearing and adoption process.

During the development of the CAP, the City has engaged stakeholders and interested community members during three public workshops. The Horizon 2035 Advisory Committee, a 15-member advisory group made up of a broad cross-section of the community, was convened to assist in CAP development. The public has also had opportunities to participate in the development of this CAP through the public hearing and review process at Planning Commission and City Council meetings.

To comply with CEQA, the CEQA Guidelines recommend that the CAP undergo environmental review and demonstrate that it will have a less than significant environmental impact for all impacts analyzed. An Initial Study and Negative Declaration have been prepared to analyze the potential environmental effects of the CAP.

APPENDIX D

WORKS CITED



WORKS CITED

- Akbari, Hashem. 2005. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. <http://heatisland.lbl.gov/>.
- Bay Area Air Quality Management District (BAAQMD). 2008. Source Inventory of Greenhouse Gas Emissions. http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx.
- . 2010a. California Environmental Quality Act Air Quality Guidelines. San Francisco: BAAQMD.
- . 2010b. History of the Air District: 1995–2000. <http://www.baaqmd.gov/Divisions/Communications-and-Outreach/News-Media-and-Features/History-of-Air-District-2005/1995--2000.aspx>.
- Bay Area Water Supply & Conservation Agency. 2010. Annual Survey and Water Conservation Report Fiscal Year 2008–2009.
- California Air Pollution Control Officers Association (CAPCOA). 2010. Quantifying Greenhouse Gas Mitigation Measures.
- California Air Resources Board (CARB). 2007. Off-Road Software.
- . 2010a. Assembly Bill 32: Global Warming Solutions Act. <http://www.arb.ca.gov/cc/ab32/ab32.htm>.
- . 2010b. Clean Car Standards – Pavley, Assembly Bill 1493. <http://www.arb.ca.gov/cc/ccms/ccms.htm>.
- . 2010c. Pavley I and Low Carbon Fuel Standard Postprocessor Version 1.0. <http://www.arb.ca.gov/cc/sb375/tools/postprocessor.htm>.
- California Air Resources Board, California Climate Action Registry, and ICLEI. 2008. Local Government Operations Protocol, Version 1.0. Sacramento: CARB.
- California Building Standards Commission. 2010a. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf.
- . 2010b. 2010 California Green Building Standards Code. California Code of Regulations, Title 24, Part 11.
- California Department of Finance. 2008. California Statewide Population.

California Department of Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. [http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20\(2008\).pdf](http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf).

California Department of Finance, Demographic Research Unit. 2010. E-5 Population and Housing Estimates for Cities, Counties and the State, 2001–2010, with 2000 Benchmark. <http://www.dof.ca.gov/research/demographic/reports/view.php#objCollapsiblePanelEstimatesAnchor>.

California Energy Commission (CEC). 2006. Our Changing Climate: Assessing the Risks to California. Web Document. Sacramento: CEC.

———. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.

———. 2009. California Energy Commission's Climate Change Activities. <http://www.energy.ca.gov/climatechange/index.html>.

———. 2010a. Nonresidential Building Energy Performance Rating Disclosure Regulations. Sacramento: CEC.

———. 2010b. 2008 Title 24 Impact Analysis. http://www.energy.ca.gov/title24/2008standards/rulemaking/documents/2007-11-07_IMPACT_ANALYSIS.PDF.

California Natural Resources Agency. 2009. California Climate Adaptation Strategy. Sacramento.

California Public Utilities Commission (CPUC). 2009. Renewable Portfolio Standard Implementation Analysis Preliminary Results. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.

CalRecycle. 2011. Jurisdiction Diversion/Disposal Rate Summary. <http://www.calrecycle.ca.gov/LGCentral/Tools/MARS/DrmcMain.asp>

Cascadia Consulting Group. 2010. City of Sunnyvale Waste Characterization Report. http://sunnyvale.ca.gov/Portals/0/Sunnyvale/DPW/recycling/SV_ReportUpdate_FINALV3KG.pdf.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

City of Sonoma. 2010. Analysis of CALGreen (California Green Building Standards Code) with Mandatory Tier 1 (CALGreen+Tier1) Compared to Existing City of Sonoma Green Building Requirements. http://www.asgi.us/calgreen/CALGreenTier1_CityOfSonoma_analysis.pdf.

City of Sunnyvale. 2006. Bicycle and Pedestrian Master Plan. <http://sunnyvale.ca.gov/Portals/0/Sunnyvale/DPW/Transportation/SunnyvaleBicyclePlan2006.pdf>.

———. 2008. Parks of the Future Plan. Parks and Recreation Department.

- . 2009. General Plan Housing Element.
- . 2010. Green Building Checklist.
- California Public Utilities Commission (CPUC). 2009. 33% Renewable Portfolios Standard Implementation Analysis Report. <http://www.cpuc.ca.gov/NR/rdonlyres/1865C207-FEB5-43CF-99EB-A212B78467F6/0/33PercentRPSImplementationAnalysisInterimReport.pdf>.
- California Solar Initiative. 2011. California Solar Initiative Geographic Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/.
- Ehrhardt-Martinez, K., K. Donnelly, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Saving Opportunities. American Council for an Energy-Efficient Economy. Report Number E105. <http://www.aceee.org/sites/default/files/publications/researchreports/e105.pdf>.
- Energy Star. 2008. Clothes Washer Product Snapshot. http://www.energystar.gov/ia/partners/eps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf.
- Energy Star. n.d. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. http://www.energystar.gov/ia/business/challenge/learn_more/ResidentialNewConstruction.pdf.
- Go Solar California. 2010. http://www.gosolarcalifornia.org/professionals/2-17-10_CalFIRST_FACT_SHEET.pdf.
- Intergovernmental Panel on Climate Change (IPCC). 1997. Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories. <http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.
- . 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.
- KEMA. 2007. City of Sunnyvale Climate Action Plan – City Operations.
- Marin Energy Authority. 2010. Marin Clean Energy Implementation Plan. http://marincleanenergy.info/images/stories/PDF/MEA_Implementation_Plan_Jan_2010.pdf.
- McPherson, et al. 2000. The potential of urban tree plantings to be cost effective in a carbon market.
- Met Office, Hadley Centre. 2009. Mapping Climate Impacts. <http://webarchive.nationalarchives.gov.uk/20100623194820/>.
- National Academy of Sciences. 2008. Understanding and Responding to Climate Change. Washington DC: The National Academies.

- National Oceanic and Atmospheric Administration, National Climatic Data Center. 2008. NOAA Satellite and Information Service. <http://www.ncdc.noaa.gov/oa/climate/globalwarming.html#q1>.
- Natural Resources Defense Council. 2010. Property Assessed Clean Energy Programs White Paper. <http://pacenow.org/documents/PACE%20White%20Paper%20May%203%20update.pdf>.
- Pacific Gas & Electric. 2010. Codes and Standards Title 24 Energy-Efficient Local Ordinances. http://www.energy.ca.gov/title24/2008standards/ordinances/sancarlos_2010-12-29_pge_zone_3_Cost_Study.pdf.
- Pike Research. 2010. Smart Appliance Sales. <http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-forecasts-Pike-Research-3290.html> and <http://www.pikeresearch.com/>.
- Pomerantz, Melvin. 2010. EPA Presentation, "Cool Pavements for Cool Communities."
- Rosenweig, C., et al. 2007. Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press.
- State of California, Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. [http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20\(2008\).pdf](http://www.csd.ca.gov/Contractors/documents/Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf).
- Tufts University. 2009. Tufts Sustainability. <http://sustainability.tufts.edu/?pid=31>.
- US Census Bureau. 2011. Profile of General Population and Housing Characteristics: 2010, City of Sunnyvale, CA.
- US Department of Housing and Urban Development (HUD). 2011. SOCDS Building Permits Database. <http://socds.huduser.org/permits/>.
- US Environmental Protection Agency. 2003. EPA Denies Petition to Regulate Greenhouse Gas Emissions from Motor Vehicles.
- . 2005a. Emissions Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. <http://www.epa.gov/otaq/climate/420f05004.pdf>.
- . 2005b. Reducing Urban Heat Island Compendium of Strategies: Cool Pavements. <http://www.epa.gov/heatisd/resources/pdf/CoolPavesCompendium.pdf>.

CITY OF SUNNYVALE

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

ADMINISTRATIVE DRAFT INITIAL STUDY/NEGATIVE DECLARATION

Prepared for:

City of Sunnyvale
Community Development
456 West Olive Avenue
PO Box 3707
Sunnyvale, CA 94088-3707

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MARCH 2014

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

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SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

ENVIRONMENTAL CHECKLIST FORM**1. Project title:**

City of Sunnyvale Climate Action Plan

2. Lead agency name and address:

City of Sunnyvale
Community Development
456 West Olive Avenue
PO Box 3707
Sunnyvale, CA 94088-3707

3. Contact person and phone number:

Gerri Caruso, Principal Planner

(408) 730-7591

4. Project location:

Sunnyvale is located within approximately 22.8 square miles in northwest Santa Clara County, in the greater San Francisco Bay Area (see **Figure 1**). The area is commonly referred to as the South Bay and is also known as the Silicon Valley, as this region is home to many of the world's largest technology corporations. The city is almost entirely surrounded by the cities of Santa Clara, Cupertino, Los Altos, and Mountain View and the San Francisco Bay, generally between Calabazas Creek on the east and Stevens Creek on the west. Sunnyvale is between two major earthquake faults, the San Andreas fault approximately 14 miles to the west and the Hayward fault approximately 18 miles to the east.

5. Project sponsor's name and address:

City of Sunnyvale
Community Development
456 West Olive Avenue
PO Box 3707
Sunnyvale, CA 94088-3707

6. General Plan designation:

Not applicable; project is citywide

7. Zoning:

Not applicable; project is citywide

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

8. Description of Project:**Introduction**

The proposed project consists of the adoption and implementation of the City of Sunnyvale Climate Action Plan (CAP). This Initial Study (IS) provides programmatic-level analysis of the proposed CAP. The CAP does not include any development proposals and would not directly result in physical environmental effects due to the construction and operation of facilities. Future projects subject to CEQA review would be required to demonstrate consistency with the goals and actions of the proposed CAP for project-level greenhouse gas (GHG) impacts to be deemed less than significant.

Project Characteristics

The City of Sunnyvale has prepared the CAP to address GHG emissions consistent with the target reductions of Assembly Bill (AB) 32 and the AB 32 Scoping Plan. The CAP would streamline future environmental review of projects in Sunnyvale by utilizing CEQA Guidelines Section 15183.5, Tiering and Streamlining the Analysis of Greenhouse Gas Emissions, which, in part, states:

Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in...a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. (CEQA Guidelines Section 15183.5[a])

The CAP would also meet the Bay Area Air Quality Management District's (BAAQMD) expectation for a Qualified GHG Reduction Strategy. The CAP identifies how the City would achieve the State-recommended GHG emissions reduction target of 15% below 2008 levels by the year 2020 (equivalent to 1990 emissions). The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. The target areas and goals of the CAP include the following:

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

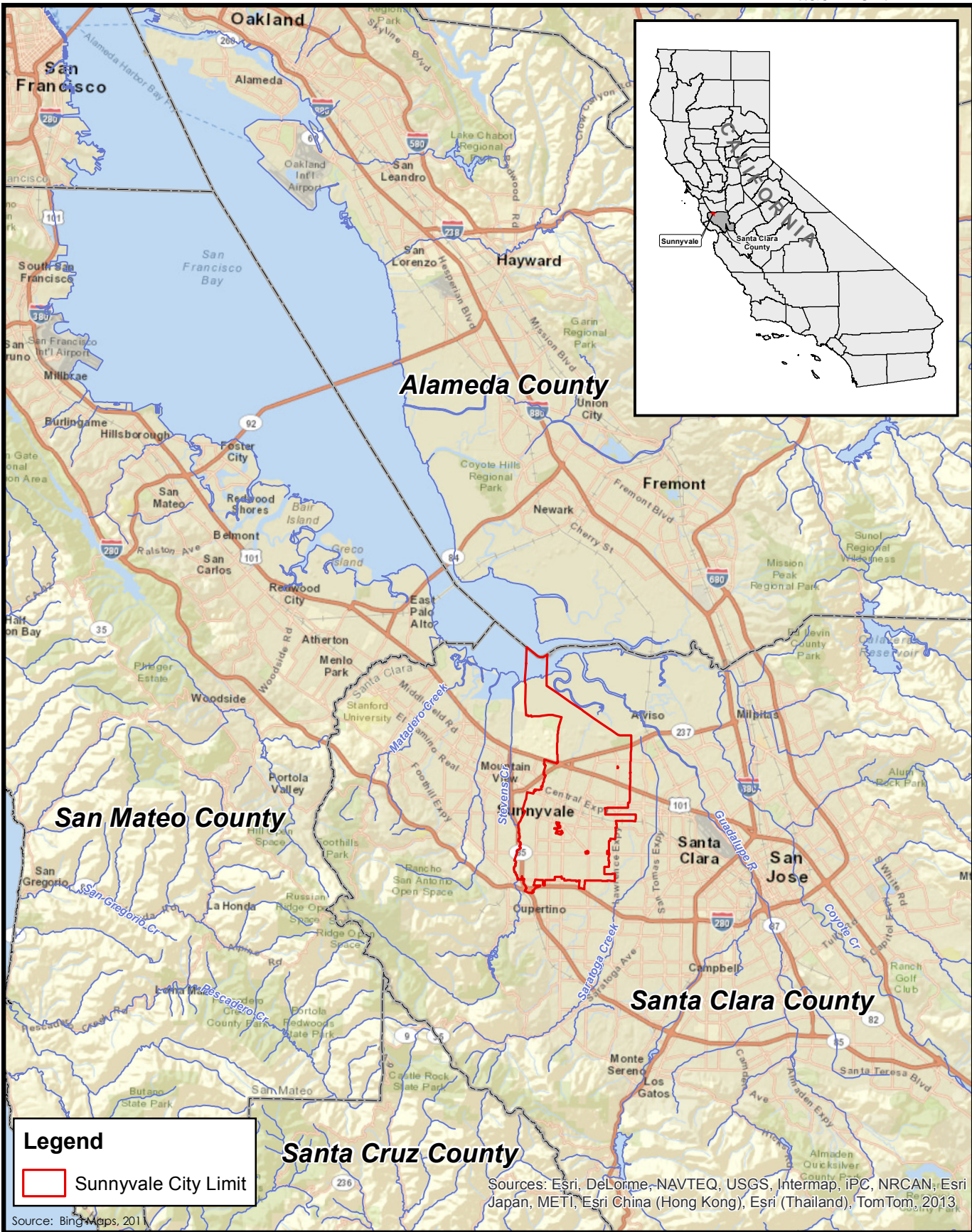


Figure 1
Project Vicinity
PMC

The framework of the CAP consists of (1) an inventory of GHG emissions that identifies and quantifies existing emissions and projected future emissions; (2) reduction targets to reduce GHG emissions incrementally by 2020 and 2035; and (3) the goals, reduction measures, and actions that have been devised to reduce existing emissions to meet the reduction targets. The City's CAP and its reduction targets are consistent with AB 32 and the California Air Resources Board (CARB) recommendations to ensure that California emissions are reduced.

For the purpose of defining "existing" GHG emission levels, the City chose the emissions in the year 2008 as a benchmark to inventory carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) generated from activities within Sunnyvale. The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use and direct process emissions related to water and wastewater, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in Sunnyvale. In 2008, the community emitted approximately 1,270,170 metric tons of carbon dioxide equivalents (MTCO₂e) (see **Table 1**).

TABLE 1
2008 COMMUNITY-WIDE BASELINE EMISSIONS BY SECTOR

2008 Baseline Greenhouse Gas Emissions	MTCO ₂ e	Percentage of Total
Residential	198,140	16%
Commercial/Industrial	502,210	39%
Transportation	442,610	35%
Community Waste	76,970	6%
Landfill Gas	3,600	< 1%
Water	6,870	1%
Off-Road	37,830	3%
Caltrain	1,940	< 1%
Total	1,270,170	100%

According to the City's "business-as-usual" (BAU) greenhouse gas forecast, community-wide emissions would grow by approximately 18% by the year 2020 to 1,494,980 MTCO₂e and by 43% by 2035 to 1,810,160 MTCO₂e. **Table 2** shows Sunnyvale's projected GHG emissions by sector.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

TABLE 2
SUNNYVALE BUSINESS-AS-USUAL GHG EMISSIONS FORECAST (MTCO₂E)

Sector	Source	2008 Baseline	2010 Estimate	2020 Forecast	2035 Forecast
Residential	Electricity	84,850	86,160	93,020	104,350
	Natural Gas	113,290	115,040	124,200	139,320
Commercial/Industrial	Electricity	387,700	399,380	463,240	578,680
	Natural Gas	114,510	117,950	136,820	170,910
Transportation	VMT	442,610	457,680	533,070	646,150
Landfilled Waste	Commercial	51,570	53,120	61,620	76,970
	Residential	25,400	25,790	27,850	31,240
Landfill Gas	Landfill Gas	3,600	3,460	2,830	2,100
Water	Gallons	6,870	7,000	7,730	8,960
Off-Road	Construction	34,930	35,620	39,310	45,580
	Lawn & Garden	2,900	2,940	3,180	3,560
Caltrain	Trips	1,940	1,970	2,110	2,340
Total		1,270,170	1,306,110	1,494,980	1,810,160
Percentage Change Since Baseline			3%	18%	43%

* The 2010 and 2020 business-as-usual growth forecasts are linear interpolations of the growth between 2008 and 2035 under the adopted General Plan growth scenario.

Other GHG emission reductions are expected to occur prior to implementation of the CAP, in compliance with several state-level programs such as the Renewable Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of the Clean Car Fuel Standard, the implementation of which would slow down the projected increases in GHG emissions. Similarly, a project to electrify Caltrain is expected to be implemented, which would further reduce GHG emissions. **Table 3** provides estimates of the GHG emissions reductions that would occur with implementation of the existing state and regional reduction programs and efforts.

TABLE 3
IMPACT SUMMARY OF STATE AND REGIONAL REDUCTION EFFORTS (MTCO₂E)

	2008	2010	2020	2035
BAU Forecast	1,270,170	1,306,110	1,494,980	1,810,160
BAU Forecast Growth Percentage		3%	18%	43%
Pavley I – Clean Car Fuel Standard	–	0	-81,150	-159,460
Renewables Portfolio Standard	–	-19,700	-90,800	-173,690
CALGreen & 2008 Title 24 Standards	–	0	-31,210	-105,400

	2008	2010	2020	2035
Caltrain Electrification (Regional)	–	0	-1,900	-2,100
Total State/Regional Reductions	–	-19,700	-205,060	-440,650
Adjusted BAU Forecast	1,270,170	1,286,410	1,289,920	1,369,510
ABAU Forecast Growth Percentage (from baseline)	0%	1%	2%	8%

The CAP includes a quantitative analysis of the GHG reduction benefit that would occur with implementation of each goal to serve as a Qualified GHG Reduction Strategy in accordance with the CEQA Guidelines and BAAQMD guidance. Reduction measures in the CAP include a diverse mix of regulatory and incentive-based programs. The reduction measures aim to reduce GHG emissions from each source to avoid reliance on any one strategy or sector to achieve the target. As shown in **Table 4**, implementation of the measures and actions contained in the proposed CAP is projected to result in emissions reductions of 438,050 MTCO₂e by 2020 and 659,910 MTCO₂e by 2035. This represents reductions of 34% and 52% from baseline (2008) levels, respectively, which is more than double the GHG reductions necessary to meet AB 32 targets. Without implementation of proposed CAP Policy EP-1, which supports participation in a Community Choice Aggregation (CCA) to increase renewable energy use in the City, the CAP would result in emissions reductions of 204,650 MTCO₂e by 2020 and 321,490 MTCO₂e by 2035, which would still meet the applicable AB 32 targets.

Total reductions with both the CAP measures and the state and regional reduction programs would be 643,110 MTCO₂e by 2020 and 1,100,560 MTCO₂e by 2035. Combined with the state and local programs, GHG emissions would be reduced by 51% by 2020 and by 87% by 2035.

**TABLE 4
2020 GHG REDUCTIONS BY GOAL**

Sector		2020 GHG Reductions (MTCO ₂ e/yr)	2035 GHG Reductions (MTCO ₂ e/yr)
Open Space and Urban Forestry		-310	-780
Decrease Energy Consumption		-70,680	-104,610
Provide a Sustainable Energy Portfolio	Renewable Energy Portfolio (EP-1)	-233,400	-338,420
	Local Renewable Energy (EP-2)	-20,980	-24,670
Decrease Water Consumption		-980	-1,520
Reduce Landfilled Waste		-53,960	-96,190
Reduce Off-Road Equipment Emissions		-7,430	-13,820
Increase and Retain Awareness of Sustainability Issues		N/A	N/A
Improve Mobility through Land Use Planning		-19,880	-21,410
Expand Sustainable Circulation and Transportation Options		-16,660	-32,380
Optimize Vehicular Travel		-13,770	-26,110
Total Reductions		-438,050	-659,910

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

9. Surrounding land uses and setting:

The Climate Action Plan would be implemented citywide.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement):

The proposed project would not require action by any other agencies.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages.

- | | | |
|---|--|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture Resources | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Public Services | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Utilities/Service Systems | <input type="checkbox"/> Mandatory Findings of Significance |

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

DETERMINATION (to be completed by the lead agency)

On the basis of this initial evaluation:

- ☒ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- ☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- ☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

Date

Printed name

Title

EVALUATION OF ENVIRONMENTAL IMPACTS

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures “Earlier Analyses,” as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:
 - a) Earlier Analysis Used. Identify and state where they are available for review.
 - b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c) Mitigation Measures. For effects that are “Less Than Significant With Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
 - a) The significance criteria or threshold, if any, used to evaluate each question; and
 - b) The mitigation measure identified, if any, to reduce the impact to less than significance.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-d) Less Than Significant Impact

The CAP is a policy-level document; it does not include any site-specific designs or proposals, nor does it grant any entitlements for development that would have the potential to degrade the aesthetic quality of the environment or adversely affect visual resources. The CAP promotes mixed land uses that enable reductions in GHGs, but this would not result in specific changes to land use designations or zoning, as the City's current General Plan and Zoning Code also provide for mixed land uses. As a policy document, the CAP would have no direct impact on visual resources, but future activities could change community aesthetics. However, any future development projects that would implement CAP measures and actions would be subject to applicable City regulations and requirements, as well as subject to further CEQA analysis of project-specific impacts, which would occur with or without implementation of the CAP. Sunnyvale's zoning regulations, standard development conditions, and design guidelines address site and building design and Sunnyvale Municipal Code Chapter 19.56 lays out regulations for alternative energy systems, including wind and solar, that set height, setback, and location restrictions for alternative energy structures that could be development under implementation of the CAP. Therefore, the CAP would not result in any substantial visual impacts on the physical environment, and this impact would be less than significant.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
II. AGRICULTURE RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forestland or conversion of forestland to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to nonagricultural use or conversion of forestland to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-e) No Impact

The city is built out and contains no important farmland, land zoned for agricultural use, or land subject to a Williamson Act contract. Similarly, the city does not contain any forestland or timberland or any land zoned for such uses. The CAP does not include policies, development proposals, or requests to rezone land or that would result in the conversion of agricultural or forestland to another use. Therefore, the proposed project would have no impact on agriculture or forest resources.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-d) Less Than Significant Impact

The city is located within the Bay Area Air Quality Management District (BAAQMD), which has prepared an Ozone Attainment Plan and Clean Air Plan to address the basin's nonattainment with the national 1-hour ozone standard and the California ambient air quality standards (CAAQS). The emissions inventories contained in these plans are based on projected population growth and vehicle miles traveled (VMT) for the region. Projects that result in an increase in population or employment growth beyond that identified in regional or community plans could result in increases in VMT and subsequently increase mobile source emissions, which could conflict with the BAAQMD's air quality planning efforts.

The proposed CAP does not include any site-specific designs or proposals or grant any entitlements for development and does not propose to change existing land use designations or zoning beyond the current Sunnyvale General Plan. Future projects intended to implement the goals and actions of the CAP would not include any new housing or employment centers and would not result in population or employment growth beyond that identified in regional or community plans. It is unknown to what extent future improvements would need to be constructed, if at all, but this analysis assumes that some infrastructure (such as purple pipes for the delivery of recycled water) or improvements like the addition of bus shelters, bicycle racks, sidewalks, etc., could be proposed in the future as a means to implement the goals of the CAP. Expansion of the city's purple pipe system is anticipated in the General Plan. Future changes to the city's

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

land uses or circulation system, if needed, would be made through updates to the Land Use and Transportation Element, which would be required to go through a separate CEQA process. Other improvements would similarly undergo a CEQA process once locations and project details are known. At this time, there is no way to know what, if any, improvements would be constructed.

In the event construction of future facilities is needed, construction of these facilities would result in short-term construction emissions of ozone-precursor pollutants (i.e., reactive organic gases [ROG] and nitrogen oxides [NO_x]) and emissions of particulate matter (PM). Emissions of ozone precursors would result from the operation of on-road and off-road motorized vehicles and equipment. Emissions of airborne PM are largely associated with ground-disturbing activities, such as those occurring during site preparation. Specifically, implementation of measure OR-2 would limit the emissions from heavy-duty construction equipment by minimizing idling times, requiring proper maintenance of equipment, and avoiding use of generators, substituting electric-powered and/or hybrid equipment, and using alternative fuels for equipment when practical. Implementation of this measure and its action items would self-mitigate any possible impacts that may occur if future projects are needed to implement the goals of the CAP.

The proposed CAP is intended to reduce GHG and pollutant emissions generated within the city by contributing to global efforts to reduce the effects of climate change by implementing reduction measures that would meet the following goals: maintain and conserve open space and promote urban forestry (measures OS-1 through OS-3); decrease energy consumption (measures EC-1 through ES-6); provide a sustainable energy portfolio (measures EP-1 and EP-2); decrease water consumption (measures WC-1 and WC-2); reduce landfilled waste (measures LW-1 and LW-2); reduce off-road equipment emissions (measures OR-1 and OR-2); increase awareness of sustainability issues (measures CA-1 and CA-2); improve mobility through land use planning (measures LUP-1 through LUP-5); expand sustainable circulation and transportation options (measures CTO-1 through CTO-5); and optimize vehicular travel (measures OVT-1 through OVT-3). The reader is referred to Chapter 3 of the proposed CAP for a full list of GHG reduction measures and details regarding the anticipated GHG emissions reduction for each goal.

Implementation of the CAP's reduction measures, along with existing actions and state programs, are intended to reduce GHG emissions in Sunnyvale by 438,050 MTCO₂e by 2020 and 659,910 MTCO₂e by 2035. In addition to reducing GHGs, each of these measures and policies would help to reduce criteria air pollutants. Also, by reducing air pollutant emissions, implementation of the CAP would help to improve any existing violations of air quality standards for criteria air pollutants that are currently in nonattainment. Therefore, the proposed CAP would not conflict with the BAAQMD's adopted air quality plans, violate air quality standards, result in a cumulatively considerable increase in criteria air pollutants, or expose sensitive receptors to substantial pollutant concentrations. This impact would be less than significant.

e) Less Than Significant Impact

The proposed CAP does not include any site-specific designs or proposals, grant any entitlements for development, or propose to change existing land use designations or zoning. Future implementing actions of the CAP could enable the future development of pedestrian and bicycle facilities, alternative-fuel vehicle and transit infrastructure, and alternative energy facilities, promote urban forestry, and decrease water and energy

consumption, none of which would create objectionable odors. The CAP provides policies and action items that would promote the future development or improvement for such facilities, but the CAP does not include any specific development proposals. The proposed CAP does not contain any components that would result in the creation of objectionable odors or expose a substantial number of people to objectionable odors. Therefore, this impact would be less than significant.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-d) Less Than Significant Impact

The CAP does not include any site-specific designs or proposals, nor does it grant any entitlements for development that would have the potential to adversely affect any candidate, sensitive, or special-status species, riparian habitat or other sensitive natural community, or federally protected wetlands or interfere substantially with the movement of any migratory species. The proposed CAP encourages efficient land use patterns and mobility, which can be achieved through the existing General Plan land use designations and Zoning Code. The CAP does not propose to change existing land use designations or zoning.

As a policy document, the CAP would have no direct impact on biological resources, but could have indirect impacts on such resources through future projects intended to implement the goals and actions of the CAP. At this time, it is unknown exactly what types of projects would be implemented and where they would be located, but it is possible that there could be some effect on habitat or jurisdictional waters. Construction of these facilities would have the potential to adversely affect biological resources. However, any future development project that would implement CAP measures and actions would be subject to applicable federal, state, and local regulations protecting biological resources. Future development projects would also be subject to project-specific CEQA analysis of project-level impacts. Several of the goals of the proposed CAP would have a positive impact on biological resources, particularly the promotion of open space and urban forestry in Sunnyvale. This could provide and enhance habitat for wildlife, as well as conserve water features and wetlands. This impact is less than significant.

e-f) No Impact

The conservation plans and policies that apply to Sunnyvale include the San Francisco Bay Plan (Bay Plan) and Chapter 19.94 of the Municipal Code. The Bay Plan gives the San Francisco Bay Conservation and Development Commission (BCDC) authority to issue permits for development within 100 feet of the shoreline of San Francisco Bay. The Bay Plan includes policies to protect and restore habitat along the shoreline. Chapter 19.94 of the Municipal Code contains the City's tree preservation ordinance.

The proposed CAP is a policy document that encourages conservation and sustainability. Future developments intended to implement the CAP would be required to undergo site-specific CEQA analysis once they are proposed. In any case, the CAP does not contain any components that would encourage development within 100 feet of the San Francisco Bay shoreline, so there would be no impact associated with the Bay Plan. One of the goals of the proposed CAP encourages the protection of open space and the promotion of urban forestry in Sunnyvale, so the CAP would assist the City in its goal of tree preservation. The CAP does not contain any components that would conflict with either the tree preservation ordinance or the Bay Plan.

The Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP) boundaries do not include Sunnyvale. There are no other approved local, regional, or state habitat conservation plans in place. Therefore, there would be no impact related to conflict with any plans or policies intended to protect biological resources, a habitat conservation plan, a natural community conservation plan, or any other approved conservation plans.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS**a-d) Less Than Significant Impact**

The proposed CAP is a policy document that does not include proposals for development projects and would not grant any entitlements for development that would have the potential to adversely affect cultural resources. Further, the CAP does not propose to change existing land use designations or zoning and anticipates that land uses will be consistent with the designations established by the City's General Plan. As a policy document, the CAP would have no direct impact on cultural or paleontological resources, but future development projects and improvements that could be proposed to implement the proposed CAP goals and actions could potentially result in adverse impacts on cultural resources during construction activities. However, any future development project that would implement CAP measures and actions would be subject to applicable City regulations and requirements, as well as subject to further CEQA analysis of project-specific impacts, which would occur with or without implementation of the CAP. Therefore, the CAP would not result in any cultural or paleontological resources, and this impact is less than significant.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a)i) No Impact

Sunnyvale is not located within a designated Special Study Zone as delineated by the most recent Alquist-Priolo Earthquake Fault Zoning map. Therefore, there would be no impact associated with rupture of an Alquist-Priolo fault zone.

a)ii)–a)iii), c) Less Than Significant Impact

As stated above, Sunnyvale is not located within an Alquist-Priolo Special Study Zone, and there are no known active fault traces within the city limits. However, there are three

potentially active faults in the city—the San Jose fault, the Stanford fault, and the Cascade fault—all of which cross the city in a northwesterly-southeasterly direction. In addition, Sunnyvale is situated within the San Francisco Bay region, which is the most seismically active zone in the United States. Three active faults are located within seismically significant proximity to the city—the Hayward fault (11.7 miles east), the San Andreas fault (7.5 miles west), and the Monte Vista-Shannon fault (4.3 miles west) (CGS 2010)—all of which are known to have a high probability of producing an earthquake of significant magnitude, which would be highly likely to result in seismic ground shaking in Sunnyvale.

Liquefaction, landslides, lateral spreading, subsidence, settlement, lurching, and collapse are all forms of ground failure that can occur during strong seismic ground shaking events and result in damage to structures and infrastructure. These effects usually occur in soft, fine-grained, water-saturated alluvium, as generally found in the Santa Clara Valley. Portions of Sunnyvale are located in an area zoned by the State of California as having potential for seismically induced liquefaction hazards. Portions of the city are designated as Liquefaction Hazard Zones (Sunnyvale 2011; CGS 2002). Furthermore, the liquefaction probability for the city is between 0 and 10% (USGS 2008). Specifically, the northern half of Sunnyvale starting at roughly Washington Avenue and the Central Expressway is considered susceptible to liquefaction.

As stated previously, the proposed CAP does not include any site-specific designs or proposals, nor does it grant any entitlements for development. Further, the CAP does not propose to change existing land use designations or zoning and anticipates that land uses will be consistent with the designations established by the City's General Plan. As a policy document, the CAP would not directly result in the exposure of people or structures to hazards associated with seismic activity or soil instability. Future projects that could be implemented to implement the CAP would not include any habitable structures and would be subject to site-specific environmental review and governed by existing regulations of the State of California (California Building Code [CBC], California Code of Regulations [CCR], Title 24, Part 2) and Chapter 16.16.020 of the Sunnyvale Municipal Code, which adopted the CBC, and City Municipal Code Chapter 18.20.100, which requires the preparation of geotechnical soils reports for all new development. These regulations require that project designs reduce potential adverse soils, geology, and seismicity effects to less than significant levels. Compliance with these regulations is required, not optional. Compliance must be demonstrated by a project applicant to have been incorporated in the project's design before permits for project construction would be issued. Therefore, this would be a less than significant impact.

a)iv) Less Than Significant Impact

Landslides are least likely to occur in areas of low relief, such as topographically low alluvial fans and at the margin of San Francisco Bay. Since Sunnyvale is generally of low relief, the potential for significant landslides or large-scale slope instability within the city is considered low. In addition, Sunnyvale is not mapped in a landslide hazard zone (CGS 2002). None of the measures, actions, or possible projects that could be developed to implement the proposed CAP would result in changes which would change the potential for landslide hazards. Therefore, the potential for landslides to occur within Sunnyvale, even during strong seismic ground shaking events, is less than significant.

b) Less Than Significant Impact

The proposed CAP does not include proposals for development projects, would not grant any entitlements for development, and does not propose to change existing land use designations or zoning. Therefore, the CAP would not directly result in any soil erosion. Future projects and action intended to implement the goals of the CAP involving land clearing, grading, and/or excavations could potentially result in soil erosion and loss of topsoil. All future development, including actions intended to implement the proposed CAP, are subject to CBC Chapter 70 standards, which would ensure implementation of appropriate measures during grading activities to reduce soil erosion. Any activities that would cause soil disturbance of 1 or more acres would be required to prepare and comply with a stormwater pollution prevention plan (SWPPP) that describes the required erosion control best management practices (BMPs).

Additional protection against substantial soil erosion would be provided by the State Water Resources Control Board–required Construction General Permit (CGP) (Order No. 2009-0009DWQ) and the City’s grading standards (Chapter 18.12.110 of the Sunnyvale Municipal Code). All regulations ensure that all development projects include the necessary control measures for erosion and sediment control as well as permanent features to minimize stormwater pollution.

The City’s current development review process also ensures that construction projects have the necessary permits and that on-site regional control measures are considered for new development projects. Continued implementation of the City Municipal Code and compliance with state law would minimize potential soil erosion impacts that may be associated with the implementation of actions intended to implement the proposed CAP. This impact would be less than significant.

d) Less Than Significant Impact

The proposed CAP does not include proposals for development projects, would not grant any entitlements for development, and does not propose to change existing land use designations or zoning. No locations or site-specific information for future projects that would assist the City in implementing the actions of the proposed CAP have been identified. The proposed CAP is a policy document, so it would not result in direct impacts associated with potential development on unstable soils.

Sunnyvale’s surficial soils are largely composed of expansive clays, which swell when wet and shrink when dry, producing ground surface desiccation cracks. Portions of Sunnyvale have been identified as having slight to moderate shrink-swell potential, which could result in development constraints for future projects intended to implement the CAP (e.g., alternative energy installations in new and existing development, recycled water infrastructure installations, and alternative transportation improvements including transit, bicycle, and pedestrian facilities). As mentioned above, the City requires all new development to conduct geotechnical soils reports under Municipal Code Chapter 18.20.100. Geotechnical reports recommend specific engineering design elements, which would address any site-specific conditions for future development in areas containing expansive soil conditions. This would ensure that impacts associated with development and actions intended to implement the proposed CAP located in areas with expansive soils are less than significant.

e) No Impact

Sunnyvale is fully urbanized, and wastewater conveyance and treatment services are provided by the City's Environmental Services Department. Section 12.08.010 of the City Municipal Code requires sewer connections for all new development. Septic tanks would therefore not be used for new development. Therefore, there would be no impact associated with septic systems.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-b) Less Than Significant Impact

According to the CAP, unmitigated GHG emissions in the city would total 1,494,980 metric tons of carbon dioxide equivalents (MTCO₂e) in 2020, an 18% increase over baseline (2008) emissions. By 2035, community-wide emissions are expected to increase to 43% over 2008 levels to 1,810,160 MTCO₂e. Consistent with AB 32, the City has identified a 15% community reduction target below baseline (2008) emissions by 2020.

As discussed in the CAP, implementation of existing state reduction programs (i.e., Renewable Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of the Clean Car Fuel Standard, commonly referred to as the Pavley Standard), as well as regional reduction programs (e.g., Caltrain electrification) is projected to reduce emissions by 205,060 MTCO₂e by 2020, a 2% reduction from baseline (2008) levels, and by 440,650 MTCO₂e (8%) by 2035.

Implementation of the measures and actions contained in the proposed CAP are projected to result in a further emissions reduction of 438,050 MTCO₂e by 2020 and 659,910 MTCO₂e by 2035, reductions of 34% and 52% from baseline (2008) levels, respectively. Without implementation of proposed CAP Policy EP-1, which supports participation in a Community Choice Aggregation (CCA) to increase renewable energy use in the City, the CAP would result in emissions reductions of 204,650 MTCO₂e by 2020 and 321,490 MTCO₂e by 2035, which would still meet the applicable AB 32 targets.

Total reductions with both the CAP measures and the state and regional reduction programs would be 643,110 MTCO₂e by 2020 and 1,100,560 MTCO₂e by 2035. Combined with the state and local programs, GHG emissions would be reduced by 51% by 2020 and by 87% by 2035. These projected emissions reductions are summarized in **Table 5**.

The proposed CAP measures and actions would achieve these reductions by reducing emissions by promoting the conservation of open space and urban forestry, decreasing energy consumption, providing a sustainable energy portfolio, decreasing water consumption, reducing landfilled waste, increasing awareness of sustainability issues, improving mobility through land use planning, expanding sustainable circulation and transportation options, and optimizing vehicular travel.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

TABLE 5
GHG EMISSIONS REDUCTION SUMMARY

	2008	2020	Percentage Change from Baseline	2035	Percentage Change from Baseline
Business-as-Usual Emissions (MTCO _{2e})	1,270,170	1,464,980	+ 15%	1,810,160	+ 42%
State/Regional Reduction Efforts (MTCO _{2e})		-205,060	-16%	-440,650	-35%
CAP Reduction Efforts (MTCO _{2e}), excluding Policy EP-1		-204,650	-16%	-321,490	-52%
Subtotal Emissions Reductions (MTCO_{2e})		-409,710	-32%	-762,140	-60%
CAP Policy EP-1 (CCA)		-233,400	-18%	-338,420	-27%
Total Emissions Reductions (MTCO_{2e})		-643,110	-51%	-1,100,560	-87%

The proposed CAP would be consistent with AB 32 and the AB 32 Scoping Plan, as the proposed CAP would achieve a 34% reduction below baseline (2008) levels by 2020, which far exceeds the 15% reduction as required under the provisions of AB 32. Therefore, implementation of the proposed CAP would be consistent with state goals to reduce GHG emissions, and this impact would be less than significant.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-c) Less Than Significant Impact

The proposed CAP is a policy document that does not include any site-specific designs or proposals, grant any entitlements for development, or change any land use designations or zoning and would have no potential to directly result in the routine

handling, generation, transportation, emission, or accidental release of hazardous materials or otherwise expose the public to hazardous substances. While future projects may be proposed to implement some of the goals and actions of the proposed CAP (e.g., alternative energy installations in new and existing development, recycled water infrastructure installations, and alternative transportation improvements including transit, bicycle, and pedestrian facilities), the types of projects would not be likely create hazards or hazardous conditions. There would be no uses that would transport, use, store, or dispose of hazardous materials which could potentially result in a potential release of hazardous materials in the environment, including near schools.

Construction of future projects could potentially result in some hazards or use of hazardous materials. Any operational use of hazardous materials would likely be limited. Any possible use of hazardous materials during construction or operation of any future projects intended to implement the goals and actions of the proposed CAP would be subject to extensive hazardous materials regulations, which are codified in Titles 8, 22, and 26 of the California Code of Regulations, and their enabling legislation set forth in Chapter 6.95 of the California Health and Safety Code. These regulations were established at the state level to ensure compliance with federal regulations to reduce the risk to human health and the environment from the routine use of hazardous substances. Compliance with required regulations is assumed. Therefore, this impact would be less than significant.

d) Less Than Significant Impact

The proposed CAP is a policy-level document that does not include any site-specific designs or proposals, grant any entitlements for development, or change any land use designations or zoning. Therefore, it would have no potential to directly result in development of a known hazardous release site. However, future projects may occur in order to implement the goals and actions of the proposed CAP (e.g., alternative energy installations in new and existing development, recycled water infrastructure installations, and alternative transportation improvements including transit, bicycle, and pedestrian facilities). The city contains many hazardous material sites known to handle and store hazardous materials or known to be associated with a past hazardous material-related release.

Because specific improvement projects are not known at this time, it cannot be determined whether they would be constructed on or near a known hazardous release site. However, any future development project that would implement CAP goals and actions would be subject to future environmental review, which would include a search of appropriate databases to determine whether the site is a listed hazardous materials site and the status of the site at the time improvements are proposed (e.g., whether further evaluation or cleanup action is required or if the case is closed). If improvements would occur on a listed hazardous materials site, the project would be required to comply with applicable federal, state, and local regulations related to hazardous materials, which would ensure there would be minimal risk of significant hazard to the public or the environment. Therefore, this impact would be less than significant.

e) No Impact

A portion of Moffett Federal Airfield, a US government airport that supports NASA test flights and US government personnel and air cargo flights, is located in Sunnyvale, adjacent to San Francisco Bay. The city is within the airfield's Comprehensive Land Use

Plan. There are a limited number of civilian operations at the airport, which are anticipated to remain for some time. Operations at the airfield are an existing known source of noise in Sunnyvale. The proposed CAP is a policy document that would not result in the development of land uses that would expose people to safety hazards associated with operations at the airfield. There would be no impact.

f) No Impact

There are no private airports or airfields in the vicinity of the city. Therefore, there would be no impact associated with safety hazards from private airports or airfields.

g) Less Than Significant Impact

The proposed CAP is a policy document that does not include any development proposals, entitlements, or changes to existing land use designations. The CAP does encourage more efficient land use and circulation patterns, so it is possible that the City could propose future projects or actions that are intended to implement the goals of the CAP. It is possible that some of these future projects or actions could require temporary road closures during their construction, which could adversely affect evacuation during an emergency event or emergency response. However, any closures would be short term, and alternative routes would be provided as necessary. It is unlikely that these actions would significantly interfere with adopted emergency response or evacuation plans. Further, all future improvement projects could be subject to further CEQA analysis of project-specific impacts. Therefore, this impact would be less than significant.

h) No Impact

According to the California Department of Forestry and Fire Protection (2007), there are no Fire Hazard Severity Zones for state responsibility areas or Very High Fire Hazard Severity Zones for local responsibility areas within or adjacent to Sunnyvale. In addition, the proposed CAP would not result in the development of any residences. Therefore, there would be no impact associated with wildland fires.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a, f) Less Than Significant Impact

The CAP does not include any site-specific designs or proposals, nor does it grant any entitlements for development that would have the potential to degrade water quality or violate any water quality standards or waste discharge requirements. As a policy document, the CAP would have no direct impact on water quality, but future construction projects undertaken to implement some of the goals of the proposed CAP (e.g., alternative energy installations in new and existing development, recycled water infrastructure installations, and alternative transportation improvements including transit, bicycle, and pedestrian facilities) could result in erosion or introduce pollutants into stormwater runoff, which could potentially degrade downstream water quality if regulations concerning pollutants of stormwater and erosion control measures are not properly implemented during construction activities. However, all future development projects, including those intended to implement the CAP, would be required to comply with Regional Water Quality Control Board standards for site drainage, as well as obtain coverage under the National Pollutant Discharge Elimination System (NPDES) statewide General Construction Permit. In addition, as mentioned under the analysis of Item b) in subsection IV, Geology and Soils, all future projects are also required to prepare a SWPPP, which would include a list of best management practices that would need to be implemented for each future project site to minimize erosion and sedimentation. Continued implementation of these requirements would ensure that when future projects intended to implement the goals of the CAP are constructed, their impacts associated with water quality are less than significant.

b) Less Than Significant Impact

The CAP is a policy document that does not propose any development, but it does include goals and actions that may result in future development projects that could potentially have environmental impacts, including the development of infrastructure for recycled water use (also called "purple pipe") citywide. The type of development that would occur in order to implement the goals of the proposed CAP would not be likely to result in new demand for water supplies, including groundwater supplies, and it would not likely result in the development of land uses with paved surfaces, which could interfere with groundwater recharge. In fact, two of the major components of the proposed CAP are to decrease water consumption and to provide for open space and urban forestry. By implementing the CAP, Sunnyvale's water demand would decrease substantially, which would result in less demand from the city's seven groundwater wells, as well as from other groundwater sources used by the city's other water sources. In addition, the CAP's focus on providing open space and urban forestry would prevent the development of impervious surfaces and ensure there are ample groundwater recharge areas available throughout the city. Combined with the CAP's goals to substantially decrease water consumption (partially through the use of purple pipe), the CAP would have a beneficial effect on groundwater supplies. Therefore, this impact is less than significant.

c-e) Less Than Significant Impact

The proposed CAP does not include any site-specific designs or proposals, nor does it grant any entitlements for development that would have the potential to alter existing drainage patterns or increase the rate or amount of surface runoff. Implementation of the proposed CAP goals and actions may require the construction of some future

projects, such as infrastructure for purple pipes, but for the most part, the CAP promotes reduced consumption and optimized use of existing structures and development. In most cases, the development that could occur in order to implement the CAP is planned to occur as part of the adopted General Plan regardless of whether or not the CAP is adopted. The CAP also provides incentives for sustainability and attempts to increase awareness of sustainability practices. Because of this, it is unlikely that the CAP would result in the need to develop structures or infrastructure which could result in alteration to drainage patterns or contribute new sources of stormwater that could exceed the capacity of the existing stormwater drainage system. However, if it is determined that improvements are needed to implement the CAP that could affect drainage patterns or runoff rates, or exceed the capacity of the city's stormwater drainage facilities, those future projects, as with all development in the city, would be subject to the City's development standards, which would minimize impacts related to surface runoff and the city's drainage system. This impact would be less than significant.

g) No Impact

Portions of Sunnyvale are located within the 100-year flood hazard area, according to the Federal Emergency Management Agency (FEMA). However, the proposed CAP would not directly or indirectly result in the development of housing anywhere in the city, including within the 100-year flood hazard areas. Therefore, there would be no impact associated with placing housing in a flood hazard area.

h) Less Than Significant Impact

As mentioned above, it is possible that implementation of the CAP may require the construction of future projects, although it is unknown at this time what and where such projects could be. However, in the event that new structures or infrastructure is needed to implement some of the goals and actions of the CAP, those future projects would be subject to all required building and construction requirements, including the Prevention of Flood Damage chapter of Sunnyvale's Buildings and Construction Ordinance (Ordinance No. 2916-10), which requires new structures built within a FEMA-designated Special Flood Hazard Area to meet certain requirements to ensure safety. In addition, it is unlikely that the types of future projects which could be built to implement the goals and actions of the proposed CAP would include the type and size of structures that could impede or redirect flood flows. This, combined with required compliance with regulations for building within flood hazard zones, would ensure this impact is less than significant.

i-j) Less Than Significant Impact

Tsunamis, or seismically generated sea waves, are rare in California due to the lack of submarine earthquake faults. However, due to its proximity to the Pacific Ocean, San Francisco Bay, and the Santa Cruz Mountains, Sunnyvale is subject to risk of inundation from tsunami, seiche, and mudflow. However, the proposed CAP would not directly or indirectly result in the construction of any housing or other habitable structures and would not result in population growth. In addition, the General Plan determined that the failure of the Stevens Creek reservoir dam could result in the inundation of portions of Sunnyvale under a worst-case scenario event, although the Santa Clara Valley Water District (SCVWD) actively maintains the dam to prevent this from occurring. Each of these potential events is extremely rare and unlikely to happen. In any event, the CAP would not increase exposure of persons to the risk of inundation from tsunami, seiche, mudflow, or inundation resulting from levee or dam failure. This fact, combined with the rarity of these events, make this a less than significant impact.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
X. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a) No Impact

Division of an established community commonly occurs as a result of development and construction of physical features that constitute a barrier to easy and frequent travel between two or more constituent parts of a community. For example, a large freeway structure with few crossings could effectively split a community. Likewise, geographic features could similarly affect the community, such as the development of a large residential project on the opposite side of a river from the existing community. The proposed CAP does not propose any changes to existing land use designations or zoning and anticipates that land uses will be consistent with the designations established by the City's General Plan. Any future projects that may be developed to implement the proposed CAP would not be of the type and size that could physically divide the community. There would be no impact.

b) Less Than Significant Impact

The proposed CAP is a policy-level document that does not include any changes to existing land use designations or zoning. The CAP also contains provisions to ensure it is consistent with the General Plan. The CAP would promote more efficient land use patterns, including more mixed uses, to improve mobility, circulation, and sustainability. While this eventually could lead to changes in land uses, the current General Plan already promotes these land uses. The CAP would simply provide incentives for future projects to take advantage of more efficient land use patterns. These types of land use changes would not substantially conflict with existing uses. This impact is less than significant.

Similarly, the CAP would promote land use patterns that—in certain places that are well served by transit—are denser and contain more mixed uses than under existing conditions. These types of land use changes would not substantially conflict with existing uses.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

c) No Impact

Santa Clara County is currently in the process of developing the Santa Clara Valley HCP/NCCP. No HCP/NCCP has been adopted as of the writing of this Initial Study. In addition, the Santa Clara Valley HCP/NCCP boundaries do not include Sunnyvale. Therefore, there would be no impact related to conflict with a habitat conservation plan or natural community conservation plan.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-b) No Impact

The proposed CAP does not propose improvements or changes to existing land use designations that would have the potential to result in the loss of availability of a known mineral resource or of a locally important mineral resource recovery site. Further, future activities would occur within Sunnyvale, which is an urbanized area that contains no known significant mineral resources or resource recovery sites. Therefore, there would be no impact.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. NOISE. Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-d) Less Than Significant Impact

The proposed CAP does not include any site-specific designs or proposals, grant any entitlements for development, or propose to change existing land use designations or zoning. As a policy document, the proposed CAP would have no direct impact related to noise or vibration, but future projects that could be proposed to implement the goals and actions of the CAP (e.g., alternative energy installations in new and existing development, recycled water infrastructure installations, and alternative transportation improvements including transit, bicycle, and pedestrian facilities) could potentially result in construction noise and vibration or uses that result in changes in noise levels.

Construction noise generated during construction activities associated with future projects intended to assist in implementing the CAP would be regulated through the City Municipal Code, which sets the legal hours of construction between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday, and between 8:00 a.m. and 5:00 p.m. on Saturday. These hours are intended to mitigate temporary noise impacts by avoiding construction during nighttime periods that would disturb noise-sensitive land uses. It

would also ensure that groundborne vibration does not occur during restricted hours, which would reduce potential impacts associated with vibration.

The proposed CAP would not likely promote the construction of land uses that would substantially increase ambient noise levels. The most likely types of projects that would be built would include things like purple pipe for the delivery of recycled water and the improvement of open space. At this time, it is unknown what other types of projects could be proposed to implement the proposed CAP and what kind of changes in the city's ambient noise environment could occur as a result. It is important to note that while the proposed CAP could promote future projects to implement its goals and actions, future CEQA evaluation would be required for future development in Sunnyvale. For this reason, combined with compliance with the City Municipal Code's requirements regarding noise, this impact is considered to be less than significant.

e) No Impact

A portion of Moffett Federal Airfield, a US government airport that supports NASA test flights and US government personnel and air cargo flights, is located in Sunnyvale, adjacent to San Francisco Bay. There are a limited number of civilian operations at the airport, which are anticipated to remain for some time. Operations at the airfield are an existing known source of noise in Sunnyvale. The proposed CAP is a policy document that would not result in the future development of any sensitive land uses that could be adversely affected by excessive noise levels resulting from operations at the airfield. Therefore, there would be no impact.

f) No Impact

There are no private airports or airstrips in the vicinity of Sunnyvale. Therefore, there would be no impact associated with exposure to excessive noise from private airports or airstrips.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS**a-c) No Impact**

The proposed CAP does not include any site-specific designs or proposals, grant any entitlements for development, or propose to change existing land use designations or zoning. Future improvements would not include the development of any new housing or employment centers that would increase the population directly or induce population. Similarly, the proposed CAP would not result in displacement of housing or people for the same reasons. Therefore, there would be no impact.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:				
a) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-e) No Impact

The proposed CAP does not include any site-specific designs or proposals, grant any entitlements for development, or propose to change existing land use designations or zoning. Therefore, the CAP would have no direct impact on public services. Future actions associated with the CAP would not include any residential uses or employment centers that would generate demand for public services. The proposed CAP does include goals and actions that would encourage and remove obstacles to improving open spaces and green spaces, which may include parks. However, the CAP would not result in increases in population that would trigger the need for new or improved park facilities. Therefore, there would be no impact.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS**a-b) No Impact**

The proposed CAP would not increase population or the demand for park facilities. The CAP contains goals and actions that may promote the improvement of green spaces, but no specific improvements or land use changes are included as part of the CAP. With no planned changes to residential or nonresidential uses in the city, the CAP would not result in physical deterioration of park facilities or require new park facilities, the construction of which could cause physical environmental impacts. Therefore, there would be no impact related to parks and recreation.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-b) Less Than Significant Impact

One of the major goals of the proposed CAP is to reduce GHG emissions, and a large component of the anticipated reductions would be through reducing emissions from transportation sources. Part of the proposed reductions would occur through improved mobility and land use planning, which promotes mixed land uses and transit-oriented development; the promotion of sustainable circulation patterns and transportation options to promote safe and efficient alternative modes of travel (e.g., bicycling, walking, public transit), commute programs and carpooling incentives to reduce the number of single-occupant vehicles on the road; and optimization of vehicular travel by promoting use of alternative fuels, car sharing, and circulation improvements. Each of these measures would help to improve circulation and existing congestion issues throughout Sunnyvale, which would comply with applicable traffic plans and policies.

SUNNYVALE CAP INITIAL STUDY/NEGATIVE DECLARATION

The CAP would assist the City in complying with, and even improving, its level of service standards. Therefore, the proposed CAP would likely have a beneficial effect with regard to performance of Sunnyvale's circulation system. Therefore, this impact would be less than significant.

c) Less Than Significant Impact

A portion of Moffett Federal Airfield is located in Sunnyvale, adjacent to San Francisco Bay. The CAP is a policy document that would have no direct effects, although it provides policies supporting the development of future projects that could have an effect on the physical environment. However, the type of projects that may be implemented would not be likely to have an effect on air traffic patterns or result in changes in location that would cause substantial safety risks. In addition, the safety and compatibility policies of the airfield's Comprehensive Land Use Plan would be considered when reviewing any future projects proposed to implement the CAP. Such projects would also go through site-specific CEQA analysis. This would ensure that this impact would be less than significant.

d-e) Less Than Significant Impact

The proposed CAP does not include any site-specific designs or proposals, grant any entitlements for development, or propose to change existing land use designations or zoning. Future projects intended to implement the goals and actions of the CAP have not yet been designed, and it is not known whether any future project would actually be needed. One of the goals of the CAP is to provide safe facilities for bicycles, pedestrians, and public transit, so if future projects need to be constructed, these facilities would be designed to increase safety and access. The City would review future development proposals to ensure they are safe and would not substantially increase hazards due to design features or result in inadequate emergency access. Furthermore, any future construction activities initiated to develop projects would go through future CEQA analysis to ensure their safety. This impact is less than significant.

f) No Impact

The proposed CAP includes goals that promote the use of alternative modes of travel by encouraging sustainable circulation and transportation options to facilitate safe and efficient bicycling, walking, and transit use throughout Sunnyvale (measures CTO-1, CTO-2, and CTO-3) and improving mobility through land use planning by promoting transit-oriented development (measure LUP-2). This is consistent with the City's adopted plans and policies promoting these modes of travel, including the goals of the General Plan. Implementation of the goals and actions of the proposed CAP would assist the City in complying with its existing goals to promote the use of alternative modes of transportation, so its impact would be beneficial. There would be no impact.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a-b, d-e) Less Than Significant Impact

The proposed CAP would not generate population or result in the development of land uses that would increase demand for water supplies, water treatment and conveyance, and wastewater treatment and conveyance. In fact, one of the goals of the CAP is to decrease water consumption, which would reduce GHG emissions by requiring less energy to pump, treat, collect, and discharge water. The CAP proposes measures that advocate for the expansion of Sunnyvale's recycled water system, which would allow more land uses to use recycled water for appropriate purposes, thereby reducing the demand for potable water supplies and the need for new or expanded treatment and distribution infrastructure. Similarly, with reduced demand for water, the demand for wastewater treatment capacity and conveyance infrastructure would also be expected to decrease accordingly. No new treatment capacity or conveyance lines would be needed.

However, this would increase the demand for recycled water, which could result in the need for new or expanded recycled water treatment facilities and conveyance infrastructure. Expansion of the recycled water system was considered and evaluated in the General Plan. The proposed CAP would encourage the continued use and possible expansion of the recycled water system, but this goal could be implemented through the currently planned facilities. In the event additional recycled water infrastructure is determined to be needed, the expansion of the system would undergo CEQA evaluation using specific project details such as appropriate sizing and locations of facilities. At this time, it is assumed that currently planned facilities could adequately allow for the implementation of the proposed CAP.

Overall, the proposed CAP would result in a reduction in demand for potable water supplies, so no additional water supply sources would be needed. Furthermore, the demand in water would result in a reduction in wastewater generation, which would ensure that the capacity of the wastewater treatment plant and the wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board would not be exceeded. Recycled water could be used and would be provided via the city's existing and planned system. Therefore, this impact is less than significant.

c) Less Than Significant Impact

As demonstrated under subsection IX, Hydrology and Water Quality, of this Initial Study, because the proposed CAP is a policy document that does not propose any specific development, it would not directly result in the development of uses that would have the potential to increase the amount of surface runoff. Therefore, there would be no need to provide new or expanded stormwater drainage facilities. If it is determined later that projects that would require stormwater drainage facilities are needed to implement the goals and actions of the proposed CAP, then additional CEQA analysis would be conducted to determine the extent of possible impacts based on project-specific information. This impact is less than significant.

f-g) Less Than Significant Impact

As mentioned above, the proposed CAP is a policy document that would not result in the development of housing or land uses that would generate solid waste which would need to be disposed of in a landfill. In fact, the CAP includes several measures and action items to reduce the amount of solid waste generated in Sunnyvale and encourages recycling and composting. Implementation of these measures and actions would reduce the amount of waste that would go to landfills. This would ensure compliance with applicable solid waste regulations. Therefore, this impact is less than significant.

	Potentially Significant Impact	Less Than Significant Impact With Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

ANALYSIS AND CONCLUSIONS

a) Less Than Significant Impact

As described in subsection IV of this Initial Study, the proposed CAP would have no direct impact on biological resources, and any future projects intended to implement the goals and actions of the CAP, if needed, would be subject to applicable federal, state, and local regulations that protect such resources. Compliance with these existing regulations would ensure that future projects would have a less than significant impact on plant and wildlife species and their habitat, or that mitigation would be required, if necessary. Similarly, as described in subsection V, the proposed CAP would have no direct impact on prehistoric and historic resources, and future projects carried out to implement the goals and actions of the CAP would be subject to General Plan policies and existing state regulations protecting such resources. Continued compliance with these policies and existing regulations would ensure that the CAP would have a less than significant impact on prehistoric and historic resources. Furthermore, future projects intended to implement the goals and actions of the proposed CAP would be subject to further CEQA analysis of project-specific impacts. This impact is less than significant.

b) Less Than Significant Impact

The proposed CAP is a policy document that would not directly result in any development, so there would be no direct physical effects that could combine with the

physical effects of other projects in the region and result in “cumulatively considerable” impacts. Although there are currently none planned, future projects could be proposed to implement portions of the CAP. Any such future projects could have impacts on the physical environment that could combine with the impacts of other projects. Any future projects intended to implement the goals and actions of the proposed CAP would be required to undergo CEQA analysis, which would evaluate the project- and site-specific impacts that could occur, as well as the potential for cumulative impacts. However, at this time it is unknown whether any future projects would be needed and if so where and when they would be implemented. Since direct impacts would not occur, and it is unknown whether future projects would be implemented, making the evaluation of any possible indirect impacts speculative, this is considered to be a less than significant impact.

c) Less Than Significant Impact

The proposed CAP would not result in any direct impacts that would have impacts on the physical environment, including effects that would cause substantial adverse impacts on human beings. However, it is possible that future projects intended to implement the goals and actions of the CAP could be proposed, which could result in indirect impacts, although at this time, it is unknown whether any future projects would actually have to be developed, so it is possible that no indirect impacts would occur. In any event, the types of future projects that could be proposed as a means to implement the CAP (i.e., development of recycled water infrastructure, facilities that support alternative modes of transit such as bicycle racks and transit stops, etc., encouraging the planting of trees, and the conservation of open space) would not be the types of projects that would be likely to cause adverse effects on human beings. For this reason, this impact is considered to be less than significant.

REFERENCES

California Department of Forestry and Fire Protection. 2007. *Santa Clara County Fire Hazard Severity Zones in SRA*. Adopted November 7, 2007.

CGS (California Geological Survey). 2002. Seismic Hazard Zones, Cupertino Quadrangle, Official Map, released September 23.

———. 2010. Fault Activity Map of California, Geological Survey 150th Anniversary, 1:750,000 scale.

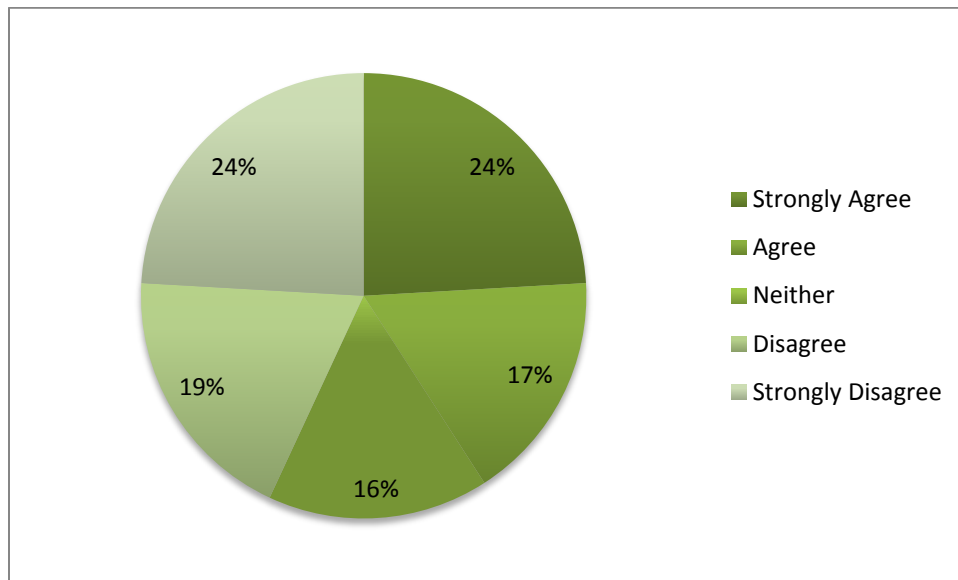
Sunnyvale, City of. 2011. *Sunnyvale General Plan*, consolidated in 2011.

USGS (US Geological Survey). 2008. Liquefaction probability for M7.8 San Andreas Fault earthquake scenario, Santa Clara County, CA.

CAP Survey Results

May 24, 2012 to March 27, 2014

Q13. The City should have programs in place that encourage businesses to minimize waste, use resources efficiently and be environmentally responsible. - Choose One

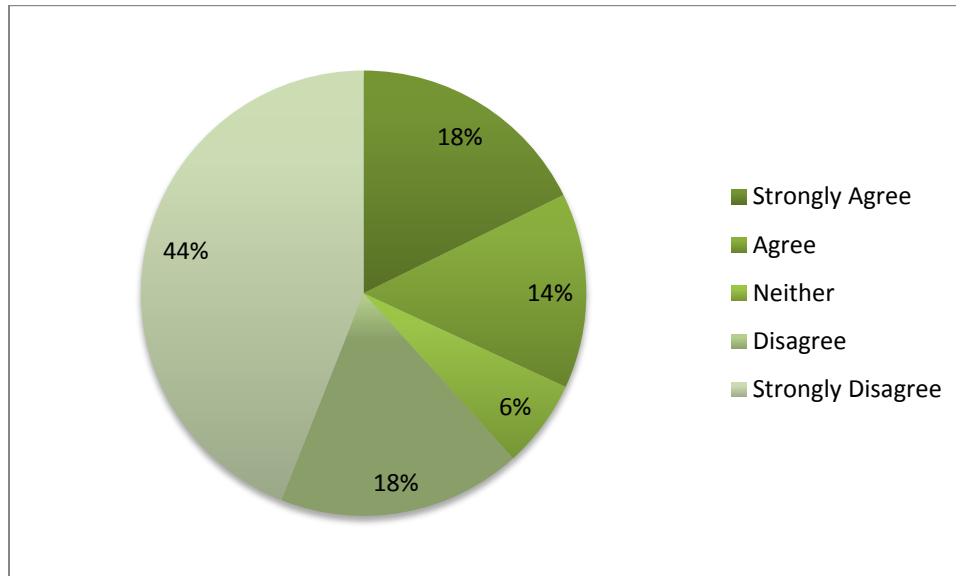


General Comments	<ul style="list-style-type: none"> No one or any business needs to be wasteful or destructive. However, a city worker that doesn't have an idea of what they are doing should not be able to impose absurd rules and regulations onto businesses. This is a given. I'd have to have examples before I agree or not.
Strongly Agree	<ul style="list-style-type: none"> The full cost of doing business should be taken into consideration, including waste and public resource use and city policy should reflect it. Sunnyvale has been very slow to adopt mixed use recycling in our apt complex, only few yrs ago. strongly agree Absolutely! transparency of operations will, not a city program Responsibility to our children and grandchildren. Cannot agree with this enough. Also, think about ways to help coordinate one company's waste stream to become another company's resource stream. But that does not mean trading increase building height for LEED certification.
Agree	<ul style="list-style-type: none"> That depends on whose definitions you apply to "minimize" waste, "efficiency" and "responsible". Where is public input on this?? are the planners elected? NO! and so are therefore not responsible to their

	<p>constituents.</p> <ul style="list-style-type: none"> As long as costs aren't going to drive business out to a cheaper place to do business.
Neither Agree nor Disagree	<ul style="list-style-type: none"> Who defines "environmentally responsible"? Basing environmental goals and restrictions on the junk science of "climate change" just hurts us all by limiting job growth. Promote it, but forget restrictive regulations. Businesses and residents will do this of their own accord. Please stop being so heavy handed. that can easily be a trick question. certainly not to hire new personnel, at taxpayers expense to start a program nor to use rules and regulations that, in effect, limit the businesses from even being able to start up their business-too many of these agendas are creating additional burdens on business to such an extent that they have discouraged them from accomplishing their goal. Most communities are aware of minimizing waste and most businesses do their part in minimizing waste. It's already being done. Don't over manage. It seems to me that we already have sufficient oversight and regulations in existence. And, if new technologies are developed which produce excessive waste or hazardous waste then new regs or methods to handle them would be established at that time. Seems to me the existing efforts are sufficient.
Disagree	<ul style="list-style-type: none"> This is an amazing assumption does this mean that the city of Sunnyvale should instill more regulations? If by "programs" you mean fines and taxes, I disagree. A great majority of people in this state voluntarily recycle and try to use resources wisely already. Government should be exemplary in its own conduct and encourage conservation. Nothing more, please. How would you rate government's conduct in this regard? How's that GSA bunch working out for us? (I say "us" because you who are drilling holes in the bottom of the ship of state will go down with her just as surely as will the rest of us...) You already have them. People don't do it Keep government out of the private sector. Government rules and regulations only hinder businesses and job growth. I disagree. Most business owners already try to minimize waste and use resources efficiently. It is incumbent on them to do this to increase their profit. Everyone should be environmentally responsible not just the businesses. The city should supply recycle bins to all at no cost and recoup the cost from the recyclables. More green living nonsense. If you really want to minimize waste try reducing the size of government. The city should get its nose out of private businesses What kind of programs? I believe businesses are already going to be thinking about minimizing waste and use resources efficiently. Won't another city "program" cost the city more money at a time when the state

	<p>is and will be cutting more programs. We as a city need to be mindful of choosing our "programs" carefully and be responsible with the "citizens hard earned money" Actually, all of these "studies" going on currently are costing alot of money at a time we, as a city should be being very frugal until we get through these tough times.</p> <ul style="list-style-type: none"> • Sounds like your planning on putting more regulations on businesses. • "should"? • If businesses fail on these points, their businesses will automatically fall off. There are Way Too Many of these programs now. That is one of the reasons of our failing economy. • Should be regulated at the state or federal level.
Strongly Disagree	<ul style="list-style-type: none"> • Again, stop regulating everything we do. • The cost of these resources is enough incentive. Those businesses that use resources efficiently will profit and grow more than businesses that do not. This has been true for centuries, and will continue to be true. No need for the heavy foot of government, let the invisible hand of the free market show the way! • Global warming is nothing more than a theory that is being proved wrong more and more as time goes by. • We do not need hall monitors from grammar school, redux.... Decide who will be responsible for their footprint prior to permitting, and then monitor, only. We have mechanica to control scoundrels as of today.... • garbage costs are high and make business owners want to save money --- and why another government agency to order private companies around • There is too many controlling laws and regulations already affecting businesses so they can not expand and provide more jobs. • "Encourage" means burdensome fines. • It's not the city's position to be involved with private business operations. • Who would decide what is environmentally responsible and how would it be enforced? • Leave Businesses alone. The state is harming them enough already. • Perhaps businesses will chose their own programs to fit their needs, rather than have a "Town" dictated program • No, stop all of these stupid regulations. You are strangling our businesses. That's why everyone is leaving CA!

Q14. Create zoning districts for businesses where there is good access to transit (e.g. bus lines, VTA light rail, Caltrain) and promote programs to reduce parking and auto use by job commuters. - Choose One

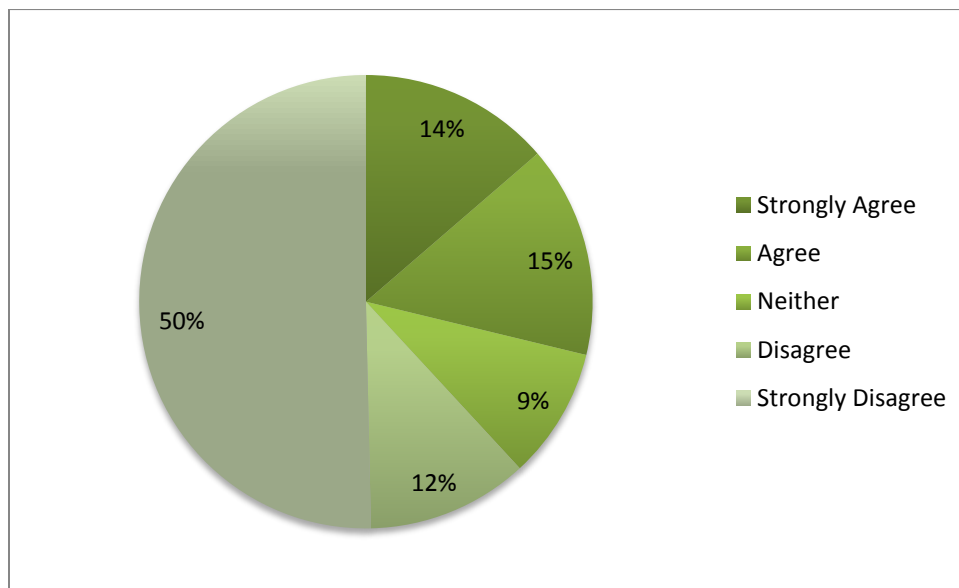


Strongly Agree	<ul style="list-style-type: none"> We need to keep all this in commercial areas, not erode our residential neighborhoods with multi-zoned areas. The city needs to think about developing a true city center, not just zoning districts for businesses. Sunnyvale was struck a major blow when we failed to get the VTA lightrail multi-modal transit center, along with a cultural center with performing arts center as was originally envisioned 25 years ago. The current "downtown" with Target and generic offices/residences is not a city center. What we need is a true civic center with performing arts and commerce. Businesses RIGHT along transit corridors makes more sense than residences. Easy pubtrans commutes would be awesome.
Agree	<ul style="list-style-type: none"> Agree having business parks near Caltrain and with shuttles to Caltrain is certainly helps.
Disagree	<ul style="list-style-type: none"> fill the pot holes work to lower gas prices. Again will give the individual more control over their time. What evidence is there that local planners, most of whom have spent their entire working careers in government, can influence economic cycles and resist downturns? Did anyone on the City staff ever study economics? it is not the cities job to tell people how to live and what they can or can not drive... You know there is a motor that runs on water that the government refuses to support. All these options are taking away my rights. Do not remove parking. Enough with all of the "programs". Stop spending money carelessly, until better times arrive.

	<ul style="list-style-type: none"> • Again, zoning districts for business is useless if the transportation system is useless. This is all interconnected. If you can't get reliable transportation that is on time, convenient, and gets you from one place to another, who is going to volunteer to get out of their car. It's useless to try and reduce auto use via zoning. If the transportation system could improve in the entire Bay Area so it's all integrated, convenient and quick to get from one city to another (ie. one ticket for bus/light rail/train AND they all meet up at the right pick up times so one does not have to wait 30 min. for the type of transportation), then people might stand a chance of getting out of their cars.
Strongly Disagree	<ul style="list-style-type: none"> • If I'm going shopping, it certainly won't be a trip using the bus. • No new zoning! • People want to drive their cars. Stop trying to discourage them! • We love our cars. It is Americana to the max. Look at LA. They have done everything possible to get people out of their cars and who can argue that it has been anything better than an absolute failure. Government please leave us alone. • We already covered this issue. What is the agenda here? • If businesses want to locate near public transit, and if people want to live there, they will do so. If you have to force them to do so through coercive zoning, and subsidize these developments through the expense of tax monies, there is something deeply wrong here, and very troubling. • Another utopian idea that makes no sense. Most people value the independence of using their own transportation. The less "promoting" you do the better • "Creating zoning districts" sounds risky. • From the above I think you can see my view (vet, businessman. regular taxpayer, BS,MBA,JD, American citizen) is that government should stay away from us worker bees as much as possible. That way we will be productive, earn lots of money, and pay the taxes that will allow you government employees to live the life style you have assume on our buck and enjoy the benefit provided you which are for the most part better than we provide ourselves. WE DON'T NEED YOU TO CREATE ANY THING FOR US.. STOP! The sooner the better! • Here you are self defeating, as I sense your goals. You say you want transport opportunities to expand, then you say you want to limit their expansion. Que? • These zoning regulations will make it difficult and costly for businesses to operate here. • already too many regulations. Back off! • People do not move into an area for their public transit. Contrary they move to better neighborhoods. • people need cars and need to park--blocking businesses from having parking will make these businesses at a disadvantage and they will fail or bring in less sales tax • People commute because they don't want to live in compacted communities. So far in my community the 'changes to make things better'

	<p>have had exactly the opposite effect.</p> <ul style="list-style-type: none"> • I have tried to find other commuters to fit into my schedule, and it has never worked out. • No parking, no business. No business, no taxes. Wake up. • Your plans do not suit the RESIDENTS of this city! • control...control...control...STOP • No! • Absolutely NOT. The car is not going away, as much as you want it to. You'll just be making life MORE miserable for the people that PAY through their taxes for all this proposed nonsense. Reduce Parking? NO NO • Here we go again with the cars are evil theme of this survey. The bay area's ecosystem is already overloaded so that limiting growth in this area and encouraging it in other areas seems like a better plan. Instead of having commute backup in one direction place additional business in locations where the commutes are evened out in both directions. • it would be a good idea to develop mixed use near the train station and along the light rail and caltrain lines.
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Q16. In order to reduce the City's contribution to greenhouse gas emissions to the environment, Sunnyvale should reduce the amount of dark, non-reflective roofing and paving material in order to mitigate the urban heat island effect and reduce energy associated with heating and cooling. - Choose One



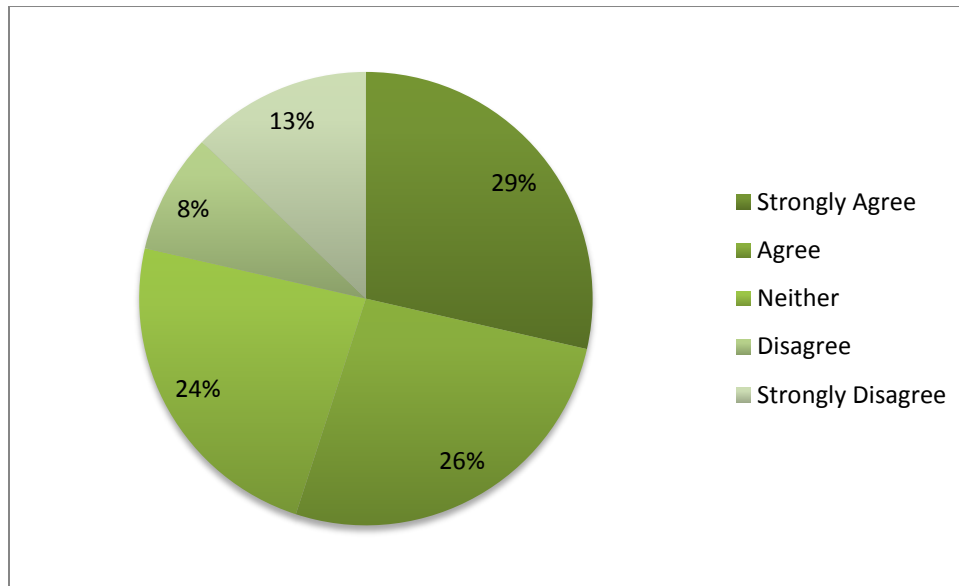
General Comments	<ul style="list-style-type: none"> • There is no danger of GHG. There is no truth to any of this garbage. It is all a scheme to control us. This is all making many people very rich through the use of lies and no science to support it. There was more GHG in the environment in prehistoric times than there is today and there were a lot less people back then and no cars. WE ARE SICK OF YOUR LIES!!!!!! • I have studied the issue of climate change for more than a decade, with a
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	<p>completely open mind. The scientific evidence is completely inconclusive. The same people who are decrying global warming and sea levels rising right now were decrying imminent global cooling several decades ago. There has been no global warming for the past 15-20 years. We don't fully understand the climate and all of its drivers. The medieval period saw warmer temperatures than we have today. Also, the climate models which have been used to promote the global warming legislation have been shown to be fraudulent (see the Climategate emails from East Anglia University). Don't get me wrong. I think the issue still needs to be studied, and I believe in conservation and responsible stewardship of our environment. But climate change is being used for social control, not for the environment. The same uber wealthy billionaires who are insisting on de-industrialization in the US are encouraging massive building of power plants in China (hundreds of nuclear and coal plants annually). Don't you think we're being played here?</p>
Strongly Agree	<ul style="list-style-type: none"> strongly agree
Agree	<ul style="list-style-type: none"> GHG- based on the Co2-e is still controversial you know. I think all new construction should include solar panels on the roofs-- especially parking lots. Reflective pavement is more important than reflective roofs, because reflective roofs may increase building heating needs in cool weather. So reflective pavement provides "more bang for the buck".
Neither Agree or Disagree	<ul style="list-style-type: none"> Yes to reducing dark roofing materials - Not sure what is meant by dark paving material. Concrete reflects quite a lot of sunlight. This is a good idea, but trivial in the overall land-use issues and opportunities.
Disagree	<ul style="list-style-type: none"> How narcissistic are we that we think humans could ever have the impact on this planet that the planet and Sun already have? Homeowners have many options available to them already to make their homes energy efficient. More mandates and building code regulations will make this fine city user unfriendly. Its not proven. Heat Island Effect. I would agree only where the city buildings and facilities are concerned where it is economically feasible. Another BS question. Comparing cost to actual benefit (reduction of "greenhouse gases") would produce "too little bang for the buck." Sunnyvale is blest with the what I call "Bay Effect." Those lovely late afternoon winds that reduce the heat effect and reduce the need for air conditioning. I have lived here over 40 years and still do not have air conditioning and survive easily the few very hot days. It's like you are trying to do something that will cost a lot and maybe benefit the area for 3-4 months of the year. Should not be regulated by the City.
Strongly Disagree	<ul style="list-style-type: none"> Global Warming is a myth, and 'greenhouse gas' is a joke. Stop pushing Agenda 21. Greenhouse gasses like H2O and CO2 do not cause global warming or climate change - climate change is as old as time and has little or nothing to

	<p>do with mankind and industrialization. It has been proven a farce. I strongly urge you to reconsider costly regulations that will harm our community chasing after some nonsense we cannot affect. We can no more change the weather than we can stop the sun from rising.</p> <ul style="list-style-type: none"> • I think its all a farce. • Not worth spending a dime on this "global warming" hoax. • This is a crock...this is a false assumption on a false faux-science theory, not proven • Is this a joke. I thought we weren't paving the streets due to cost. This is enviro waconess to the max. • Why doesn't Sunnyvale return all land inside the city limits to the way it existed in 1890? That will eliminate traffic and heat from roof tops. • Greenhouse gas has been considerably reduced and is now being used as a Control mechanism once again stifling businesses. • Would this be for new construction only? If not, who would pay for this? More financial burden for questionable results. • Please have someone explain green house gases to you. Your focus is on "emissions" mostly from internal combustion engines. They are a tiny,tiny part of GHGs, water vapor (uncontrollable, and by FAR the greats GHG is never discussed. The entire concern is favored by government developers be cause of the power and control to be gained by harping endlessly about what is a fraud. I know you know this. I just want you to know we know it, too. And just as soon as a few voting cycles permit us, we will oust from office those who support this hoax and the basis for regional planners jobs to be continues, • You are neglecting the benefit of heat latency in Winter months, and it's affect on Carbon load.....All energy produces greenhouse gases.... • This is a business cost decision based on the savings which can be achieved by using energy efficient materials. • Who is going to pay for this goofy idea? PS, global warming is a farce. • None of your business what color my roof is. It's MY roof. • PG&E is very expensive and if these types of materials save money --people will use them . People aren't stupid--we don't need a bureaucrat at our elbow telling us \$5 is less than \$6 . And then charging us the huge employee benefits to do so . • Do you really think that compacting more people into a given area will reduce heat? Query #16 sounds very much like another contractor heaven and taxpayer hell. • Greenhouse gas emissions are a non-issue regarding our environment; their effects are exaggerated in order to allow the government to favor one industry over another. • This isn't a problem. • Are you crazy? Get real - this cost would be prohibitive, and it is unnecessary. We don't have any global warming,#1, greenhouse gas emissions is a joke - on the people who live here! • The effect of greenhouse gases is over-blown and should not be used to create nanny-state government
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	<ul style="list-style-type: none"> • Forcing residents and businesses to comply with this is foolish and costly. • Really? • Absolutely not! • GREEN HOUSE GASES is a way for the GOVERNMENT to steal our tax dollars. Al Gore and others have made a FORTUNE on this nonsense. The same folks who once said we were going into an ice age now say we have man made "global warm". I studied science. In high school EVERYONE who took science KNEW science had NOTHING to do with CONSENSUS. It was about Questioning? Fake science and rigged computer projections are for the weak in education and common sense. • There is no credible evidence that there is man-made global warming. It is a natural phenomenon. • Dark roofing helps in the winter to keep a bldg warmer so you use less energy. • Control freaks • Pan-made global warning is a proven fraud. Pay attention to the SCIENTIFIC evidence, not the Marxist lies. • Surely you are kidding • greenhouse gas...a \$cam. • Oh brother! Stay out of our lives. • #1 Where do you think you're getting the money for these things? #2 Our environment is terrific. Have you been to Bangkok or Mexico City? and #3 If the US allowed energy industries to do what they're so good at doing, we wouldn't have an energy shortage. • absurd ..
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Q17. Sunnyvale should increase the number of shade trees planted in the community, and protect the existing tree stock. - Choose One

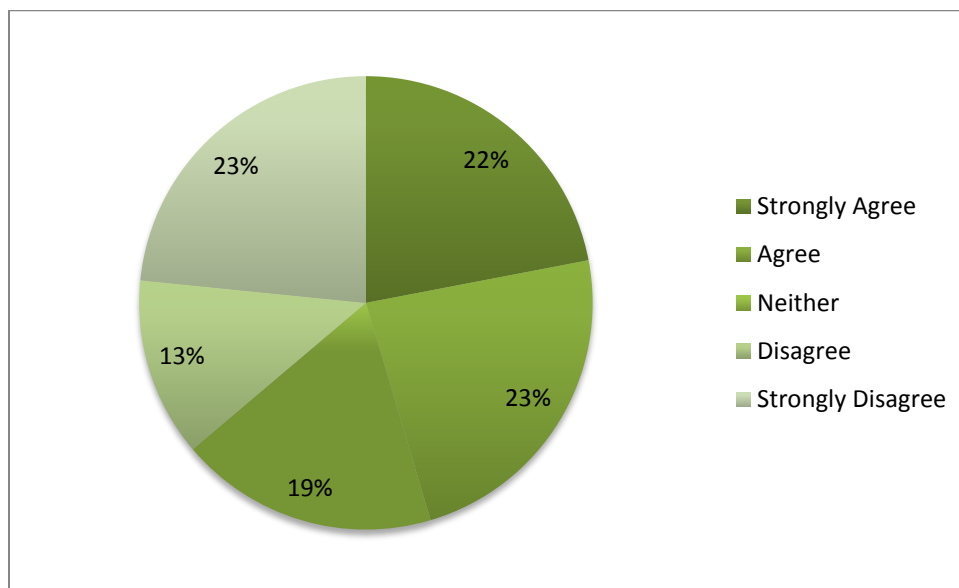


General Comments	<ul style="list-style-type: none"> The cost to the city for planting shade trees for the sake of planting shade trees is a waste of money in difficult economic times. Sunnyvale needs to plant trees that do not uproot sidewalks, and ones that drop spiny balls people trip on. Why were these planted someone tell me?
Strongly Agree	<ul style="list-style-type: none"> Now your talking. Shade trees are great, and a great long term investment in the health and quality of life of the community. Please, let's try not to do this with coercive zoning and public private partnerships. Let's encourage the Kiwanis, Rotary, schools, and general citizens to participate in a program like this. Plant trees by all means, please! However compacting communities leaves little room for living things like trees. Do protect existing trees, everyone is quick to cut them down, it takes decades to regrow them. Trees give us oxygen in exchange for our pollution. More trees is always a great idea. Use native trees that do not need a lot of water Trees are wonderful Oxygen producers for humans and natural air conditioners, so I'm all for trees. BUT buying and planting more? - where's the money coming from? How about just protecting existing tree stock? Sound good? This is important. However what is missing are a push to reduce the amount of concrete and pavement on road side strips. All the surfaces paved-over, the rain water cannot seep into the ground and will just run off into the bay. We will see more dry years so water conservation and management will be key for the city. more care should be given to tree choice; Sunnyvale has failed completely

	<p>in that respect. Nor does it care for or encourage owners/tenants to care for "street" trees.</p> <ul style="list-style-type: none"> • very strongly agree • YES we need trees! They keep neighborhoods beautiful and provide for the environment. Trees also increase the value of a neighborhood, thereby increasing the city tax revenue. • Trees define the feel of a neighborhood as much as buildings do. • Many trees in the public right-of-way are unhealthy and need to be replaced.
Agree	<ul style="list-style-type: none"> • Trees are good, as long as you are not planning to rezone a residential neighborhood as a park and make everyone move out so you can plant more trees. • Now this make sense and is task a government employee might be good at. • As long as it does not create undo burden on the community.. • If I have choices near my home • As long as it is not mandatory on homeowners when replacing an existing diseased tree with a tree that the city has deemed appropriate. This is still a private property right of the homeowner. • The city then should be responsible for maintaining the trees. • Please select street trees that do not create droppings on pavements and driveways that are very hard to clean. • but only on City property. Home owners should be able to manage their trees they way they want.
Neither Agree nor Disagree	<ul style="list-style-type: none"> • Trees are good. But why is it only up to the city government to plant trees? • Sounds o.k. Once again most people enjoy trees but don't need special legislation for planting trees. It for the most part happens naturally. • Be careful, there is a downside, allergies, clean up, etc • Trees are good in the city if the budget allows. • The city has made poor choices in the past, leaving us with some trees that wreck the adjacent sidewalk, and others that leave dropping hazardous to bicycles!! • Wo is gong to pay for all of this? • More trees are always nice, however to make those decisions now, at this time is not wise. City's are having tough times keeping up with tree trimming costs etc. as it is. • I would agree if I did not want the city to REDUCE STAFF and stop spending so much money and regulating us to death. • Sunnyvale already has a tree preservation ordinance. Developers are allowed to remove protected tree while homeowners are forced to keep unwanted trees. All property owners should be treated equally with regards to trees. • Trees versus solar panels - that is the question. Protecting existing trees is obviously good but forgetting that trees are a renewable resource has made for far too many intrustive rules regarding trees on private property. Just take care of the street trees correctly. Find arborists who

	really can choose trees appropriate for the locations need. And, make sure that the arborists properly train the tree trimmers as to the proper way tprune each different species under the city's control. Improper pruning has certainly ruined many local trees. Start cutting down some of those trees that have been so ugly pruned to give space for power lines etc. Don't think the city has proved itself to be any better protectors of trees than the local residents.
Disagree	<ul style="list-style-type: none"> Based on the implicit assumptions in this survey, those most in need of education are the staffers who came up with the plan and created such a biased survey.
Strongly Disagree	<ul style="list-style-type: none"> The trees that line the streets are terrible. They drop tons of debris and have flowers which are causing allergies to increase. I say cut those down, and plant something pretty. Following the suggestion in #16 will achieve this. "Protecting existing tree stock"? Does this mean enacting restrictions of home owners from managing their own trees? Really? In reality, trees lift pavement, city doesn't water them and doesn't fix pavement either. Otherwise, trees are great. Only City trees. City should not regulate trees on personal property.

Q18. Educate and involve the Sunnyvale community regarding actions they can do at home to reduce energy, water, waste, and fuel consumption. - Choose One

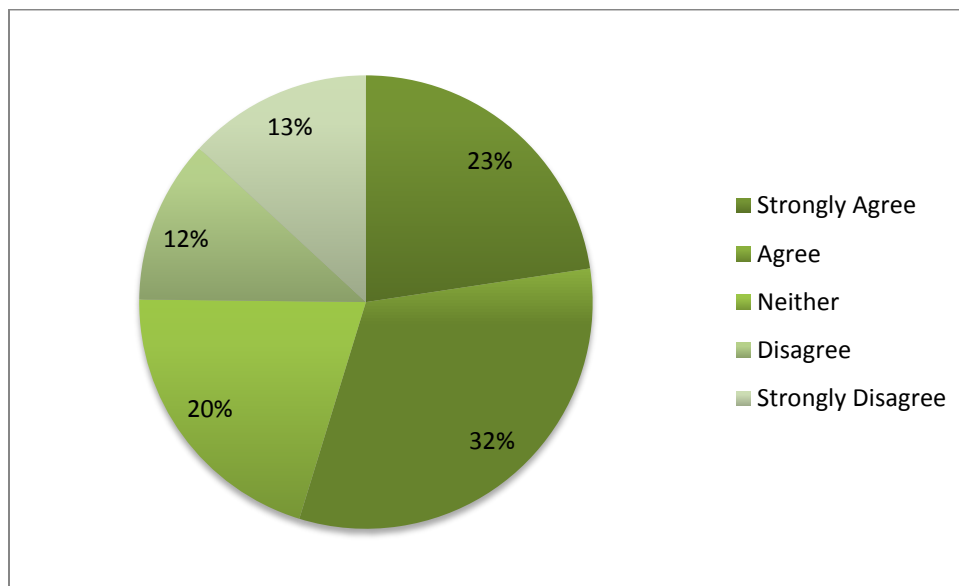


Strongly Agree	<ul style="list-style-type: none"> Work with schools to educate children, who will educate their parents. Have competitions between schools to save energy and water. Not just educate, people respond to incentives, so create them! Especially foreign born residents, many dont have a clue how to recycle. strongly agree
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	<ul style="list-style-type: none"> • Sunnyvale is already reasonably good about this. • We're not idiots. We know how to do this already. Why waste money on wasteful programs like this?
Agree	<ul style="list-style-type: none"> • Educating is fine, but mandating and regulating will only chase away those who can move to "higher ground." • Unless people in Sunnyvale are stupid that has already been done. • Most people will buy into a good program. • give suggestions, don't mandate!!!! • As long as it is not forced upon the community • Just don't mandate things that are too expensive. Our living expenses rise too much often to be able to afford more payments to the government like cap and trade. • To teach people about recycling is good. However, most if not all, people already know the actions necessary to reduce usage and waste. They should want to participate not be forced. Voluntary actions will reduce the waste 10 fold over forced actions.
Neither Agree nor Disagree	<ul style="list-style-type: none"> • Why do we fund k-12? • Let the citizens do this of their own accord. Please stop trying to be a nanny to us all. We are citizens, not infants. • Residents of this state are already aware of energy conservation and recycling. I think this can be taken too far as in the case of the "lunch police". • Okay, so long as it doesn't take several departments to get it done. • Education is great, imposing government requirements is not. • It is a nice thought and almost everyone agrees that reduction in what we use is good. We were rewarded for saving water, energy, fuel and reducing waste. While we reduced they increased charges, great idea?! • Not a bad thing, if it can be done efficiently and without hiring new employees to attack this "problem."
Disagree	<ul style="list-style-type: none"> • People will conserve energy based on rational self-interest. No need for the city to spend money to try to make that happen. • we get this education at school and with garbage bills and on TV --we don't need to set up more government agencies . • This isn't the city's job. Don't treat us like a bunch of unaware morons! • Sure, educate...but what is meant by "involve". But haven't we already been educated in this subject? Sounds like will costs more tax dollars. • Brainwashing is what I'd call it.
Strongly Disagree	<ul style="list-style-type: none"> • Again, stay out of our lives. I don't want to live in a Socialist city. • We are capable of doing this ourselves. We don't need consultants dictating and regulating how we live. • I am sure the community does not need more education regarding energy. Everyone is doing his bit and more. Children are learning about this as a priority in schools. Another overhyped crisis. • If you see the people as ignorant, they are. Once schooled, most folks resent further attempts to be "educated". Unless you foresee a new breed of person?

	<ul style="list-style-type: none"> • Good idea -- but let's allow market forces to help reduce waste. • Not with my tax dollars • Not taxpayers role to pay for ostensible green experts to boondoggle the public. • Already done • You're back on the control bit again. • Enough - THAT IS NOT YOUR JOB. We have schools to educate kids. ADULTS ARE ABLE TO THINK FOR THEMSELVES. Your PROPAGANDA is very transparent. Employing even more employees while we are in a very bad government-caused recession. • People can educate themselves-- they don't need indoctrination • stop trying to micro-manage everything • You mean tells us what, when and how we must do things? • If you will stop at just informing the population okay. The city is populated by very intelligent individuals who have been listening to this message for over 30 years now. I think they know what to do. I do congratulate the city on providing the means for us to recycle. Reduce the amount of increase in future housing and jobs projections. No way with the projected increases that current facilities even with some expansion can ever be increased sufficiently to handle the additional waste management or water needs. • I think there are a number of agencies doing this. In particular PG&E.
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Q19. Decrease the amount of waste sent to landfills through increased recycling, composting, and materials management. - Choose One

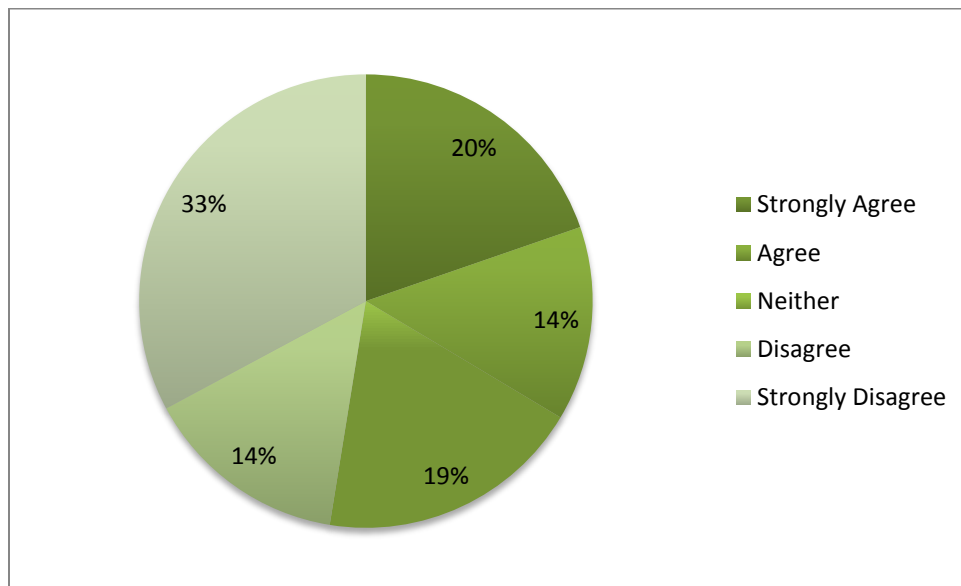


General Comments	<ul style="list-style-type: none"> • There are already increased materials management policies and procedure which address these issues.
Strongly Agree	<ul style="list-style-type: none"> • That is not happening now? What are you doing wrong?

	<ul style="list-style-type: none"> • strongly agree • Increase the types of recycling we can set aside! Huge amounts of plastic can't be collected in our current bins. • Composting bins would be really useful!
Agree	<ul style="list-style-type: none"> • Good, but see previous comment. (Residents of this state are already aware of energy conservation and recycling. I think this can be taken too far as in the case of the "lunch police".) • Almost everyone is already doing that like it or not. Yes it is good to recycle even when it is mandated. However the increased costs are passed on to us, like it or not. • Just don't raise our trash hauling fees, we are already paying too much for these services. • Make it easier for people to recycle and they probably will do more of it. • I strongly recommend outsourcing these jobs to private companies. They do a more efficient job at a reduced cost than City departments. • We already do this.
Neither Agree nor Disagree	<ul style="list-style-type: none"> • Certainly if there is a market for this. Not at added cost and certainly not if the efforts do not translate into anything substantial. • Let the citizens do this of their own accord, and let them come to the city, if necessary, for minimal and appropriate support. Please stop trying to be a nanny to us all. We are citizens, not infants. • This is already being done. Most people are very diligent about this. • Frankly, many of us see this as a scam. It sounds good, but I expect the program costs taxpayers and residential users a bundle • They are in place. people don't do it • Are city staffers better able to pick winners and losers than the Federal government? Would you have us fund more companies like Solyndra? • This should be voluntary - not regulated. • Yopu people are power happy • Think that current effort is sufficient. Basically same answer as question 18 response.
Disagree	<ul style="list-style-type: none"> • Just more overbearing regulation on top of the old regulations. • in the olden days before all this politically correct way of doing things, we used to be able to burn our trash in our incinerators and/in our kitchen stoves that had a place to burn things. in those days, we didn't seem to be bothered by or worried by gas house emissions, and many of us are left to tell that tale, so survival did not seem to be such a 'crying' issue as the environmentalists would have us believe. • FORCED composting is messy and leads to vermin. If people WANT to do it--cool since they will care to do it right. Mandate it--and it is a health hazard • Been there doing that and now all of our services for waste, water, and sewer are being raised due to our conservation - that would be the city of Livermore. • Keep encouraging, as have been doing. But no regulating. Sunnyvale already separates the trash to reduce amount that goes to landfill. • NO

	<ul style="list-style-type: none"> In these difficult economic times, people will start ON THEIR OWN to conserve energy an to recycle; just as Americans did during the Great Depression and WWII.
Strongly Disagree	<ul style="list-style-type: none"> We are already recycling. The city should permit the disposal companies to use new means of disposing of waste as it is developed At what cost How much taxpayer money is this little survey costing us? what does it mean? how?

Q20. Increase the amount of renewable energy produced in Sunnyvale and find ways to increase renewable energy delivered to the City. - Choose One

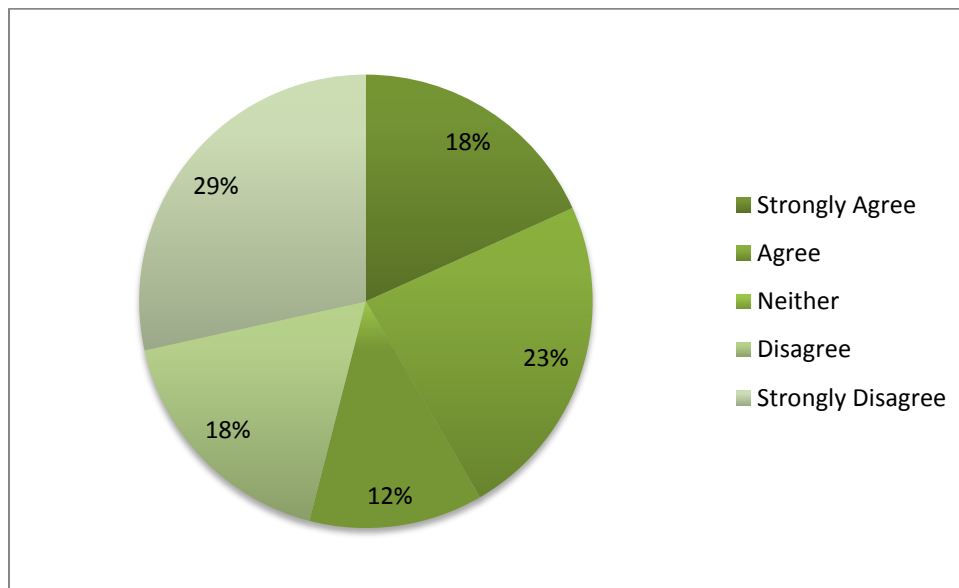


General Comments	<ul style="list-style-type: none"> Exactly what are you increasing? Does anyone even know what renewable is? How much energy goes into making these 'renewable energy projects'? Break even, maybe. how?
Strongly Agree	<ul style="list-style-type: none"> Good idea, but don't let the renewable energy goal supersede good financial planning. Solar power has become cost-effective and is a worthwhile investment for the city. See comment about solar panels on roofs and parking lots. (I think all new construction should include solar panels on the roofs--especially parking lots.) Promote installation and operation of solar electric panels on commercial and industrial buildings. Check out distributed generation stuff like wind and group-purchase solar.
Agree	<ul style="list-style-type: none"> As long as the average citizen can afford it. As it is most middle class

	<p>families are having difficulty living in California because of the cost. We will have to pick up and move if costs keep rising at the current and frequent rates.</p> <ul style="list-style-type: none"> • If you can do it with reasonable expenses. • agree
Neither Agree nor Disagree	<ul style="list-style-type: none"> • At what cost to the consumer? If the cost goes up how will the people living in the low income housing pay? Will the taxpayer in Sunnyvale be required to subsidize? • how do you propose to accomplish this and at what expense to the taxpayer? • Hopefully they will be better than other notable failed alternative energy companies. • This is not rocket science. If you are unaware of these possibilities, then someone else needs to be educated and encouraged. • This is a vague question. What do you have in mind here?? • Think this is pie in the sky, wishful thinking for far too many reasons to write here. But, after looking at the NRDC renewable energy for America map, it seems that all good spots for wind in Northern CA are already being used; solar ability for our area is about midway between modest and high capacity; same for biogas, biomass and geothermal. Building appropriate facilities for saving and transferring energy from these sources will be hard to do as environmentalists will have many objections. Water is also a renewable but as long as Gov Brown and voters of San Francisco don't destroy a system that works extremely well when there is good snow pack. Water, sun and wind are not 100% reliable resources as they depend on Mother Nature who will never be controlled by man.
Disagree	<ul style="list-style-type: none"> • How? Windmills in everyone's front yard? Government-subsidized solar panels? Where is the money for these renewable sources going to come from? Who's paying for all of this? Tax payers, that's who. • Have you looked at what is happening in the so-called renewable industry, they are going bankrupt one after the other, should stay out of it. • It does not work in large usage • Renewable energy as it is today is not sustainable in its present forms and should not be sought after until it truly is... • The city can't fund the services it now provides. Why take on more stuff that private business can handle IF it is cost-effective. If not cost-effective, why waste tax dollars on it? • Not if it involves spending money. • Wind and solar are failures at producing massive amounts of energy needed at affordable costs. What other energy sources are you considering?
Strongly Disagree	<ul style="list-style-type: none"> • Solar and wind will never create enough power. • Like Solyndra? • Buy the cheapest energy available. Don't waste the city's money buying • Too expensive and will increase the city budget tremendously. Need to

	<p>wait until the price per kw is competitive with existing methods. energy that makes you feel good.</p> <ul style="list-style-type: none"> • Not the job of the city government. • Renewable energy costs more and does less. We have plenty of existing energy sources if bureaucrats would allow its use. Renewable energy should be worked on but it is far from being sufficient for our needs. • Another 'HUH'? from me on this one. • Again, government regulations on businesses are not the way to achieve this. If renewable energy is cost effective, the marketplace will naturally migrate in this direction. • we are in a recession--this type of energy is the MOST expensive. If a private business wants to set up a company--fine--but it should not be run by the government • Leave me alone • Sounds like a method to hire more employees. And, for what? Solar is too expensive and not cost effective. Wind? You're dreaming. • Government should NOT be involved in this. If it's a good deal, private companies with their private investors will fill any perceived need. • And how much more of our taxpayer dollars are you going to take for this? STOP!
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Q21. Reduce water-related greenhouse gas emissions through reclamation, conservation, and improvements to the water and wastewater processes in Sunnyvale. - Choose One

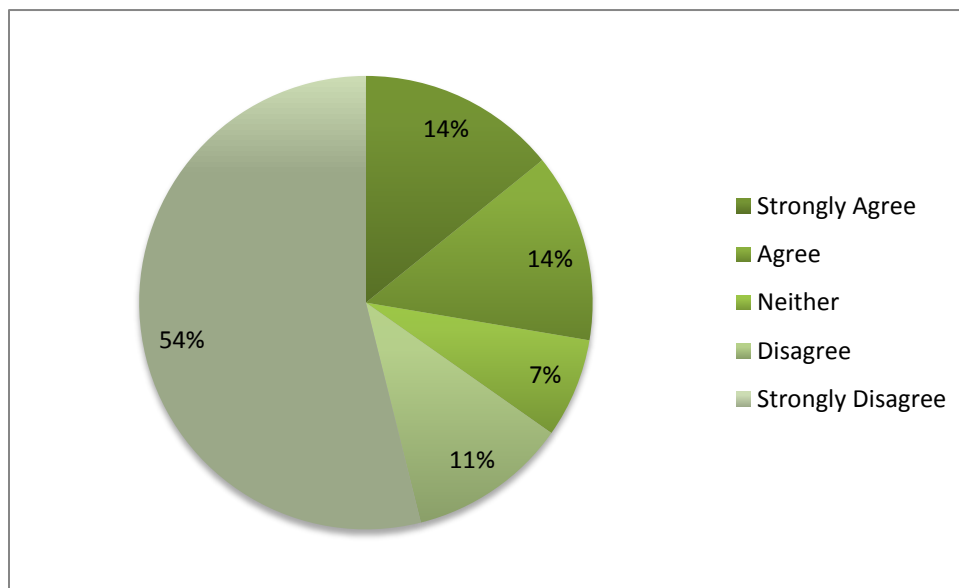


General Comments	<ul style="list-style-type: none"> • Wow! Now we're going to control the oceans...there is just no task too great for a planner to undertake so long as the tax payers can be duped into paying for it Agree? • how?
Strongly Agree	<ul style="list-style-type: none"> • Once again, a political non sequitur, are you running for office. If you are

	<p>already employed by our community, you need to be scolded, and encouraged to try harder.</p> <ul style="list-style-type: none"> • Expand the recycled water system. City parks should conserve water. City should use more drought-tolerant plants for landscaping. • This is not only a greenhouse gas issue, because clean water availability is expected to decline over time.
Agree	<ul style="list-style-type: none"> • Green house gas is not proven. Recycle the water is great • IF done at no extra cost • Again, without raising taxes. Can you do it? • Water rehab should be a high priority. But, your greenhouse gas emissions story is just that. • Definitely an essential City responsibility! Water is Life! Again, outsource to private companies whenever possible. • agree
Neither Agree nor Disagree	<ul style="list-style-type: none"> • These are all fine ideas, but you do not need government to dictate what we do in every part of our life. • From what I have read about our city it seems we have already made great strides in these areas. "Greenhouse gas emissions" are not our most serious threat - it is too many people who will overtax the bay area's fragile ecosystem. • I have no data on this.
Disagree	<ul style="list-style-type: none"> • Water-related greenhouse gas emissions? Water vapor makes up the majority of greenhouse gases, and is completely harmless (ever heard of the water cycle?). • Good idea. Also, fill in the bay to reduce evaporation. • I am in favor of less govenmental ways of trying to accomplish these very questionable issues • Who would pay for this...yet another tax? • What you really mean is "Should we allow City staffers to decide how we live, work, and go about our daily activities?" • Leave me alone • This will absolutely cost us more than we can afford. Our water costs just went up last year. Regulations and their costs are why more people left California last year than came to live here. • I don't agree wth the claims of global warming. Isn't that why they are calling it climate change now because of the false claims that the earth is being warmed by greenhouse gas emissions. We need CO2. Trees convert it into Oxygen!!
Strongly Disagree	<ul style="list-style-type: none"> • Greenhouse gas? What a joke. • Don't waste a dime on the "global warming" hoax. • California is already driving people and businesses out with their measures. If you double up on their efforts you will exceletrate the process. • Please stop trying to be a nanny. Where reclamation, conservation, and improvements to water and wastewater processes make sense, people will do them. The people who are telling you we have to reduce greenhouse gases in Sunnyvale back to stoneage levels are the same

	<p>people who live in 20,000 square foot houses, fly in private planes, and are building hundreds of new power plants in China every year. Don't you think we are being played here?</p> <ul style="list-style-type: none"> • Another hype. Where does it end? One scare tactic after another. What is meant by reclamation? • Kind of a catch all phrase isn't it, 'greenhouse gas emissions'. What next, carbon credits? • NO • so-called greenhouse gas emissions have nothing to do with it. The reclamation, conservation etc. are good goals in and of themselves. • Greenhouse gas emissions! What a crock. You get paid our taxpayer dollars for this? How do you feel deep down inside? Got any morals?
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Q22. Plan and organize land uses in the City to reduce the amount of times cars are needed to complete daily activities. - Choose One

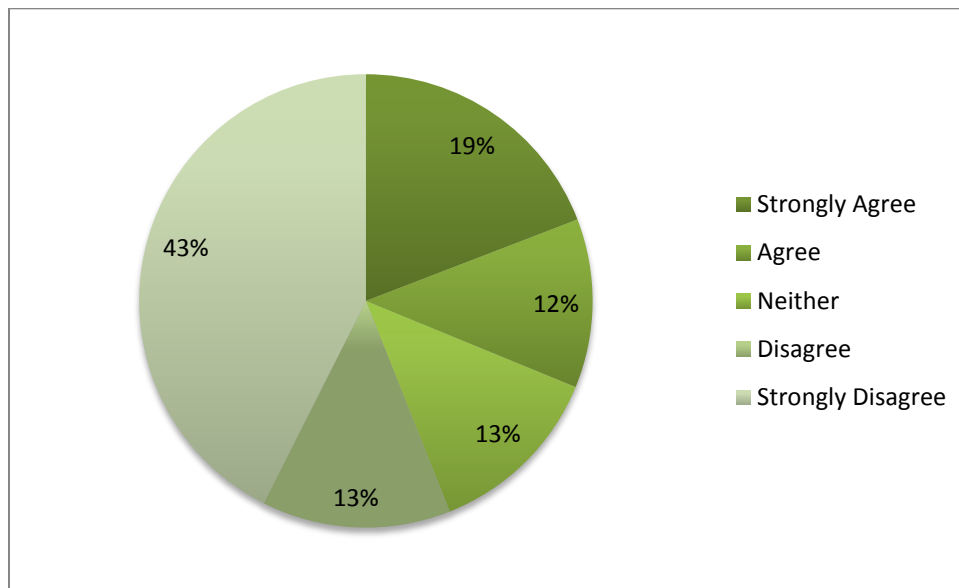


Strongly Agree	<ul style="list-style-type: none"> • More buses on the weekends.
Agree	<ul style="list-style-type: none"> • This old stuff. Is this not being done currently? • agree
Neither Agree nor Disagree	<ul style="list-style-type: none"> • This is so vaguely worded that I don't know what you want to specifically do. • Again, this sounds great in theory. But if it just turns into making driving unpleasant, without actually improving the walking and public transit experiences, it's not a real benefit. • so.. the idea is for everyone in sunnyvale to work in sunnyvale and not commute outside of town.. ..realistic ?
Disagree	<ul style="list-style-type: none"> • Central planning...sounds a bit like Soviet society. • What gives you the right to dictate auto use to the citizens? • Don't see how this can be effective relative to the investment level

	required to pursue.
Strongly Disagree	<ul style="list-style-type: none"> • That is fascist. Cut it out. • Stop trying to discourage us from using our cars. • Again how about filling the potholes? • Sunnyvale residences are not going to like this. More government controls of our lives. No wonder people are leaving California. Maybe that's what the Sunnyvale government wants. • Not the job of the city government. The residents are adults and citizens, not infants. • definitely Not • Another overuse of planning and organizing with the war on cars being the motivation. • People want to drive their cars, so you need to plan for that! • Let's see, "Second verse is like the first, a little bit louder and a little bit worse!" How many times and in how many ways are you going to ask the same question? It's beginning to feel like the third degree. On the other hand, keep fishing, you might get an answer that suits your agenda...hey! Who knows? • That is control of the people • Government should not interfere in the individual's choice as to when/where to use cars. • Stop with the regulation madness!! Don't you think people are responsible? • Utopia? Seems to work only for those in power. • The scope of this question is mind-boggling. We don't need a Soviet Land use bureau. • Somehow government plans always seem to fail and cost taxpayers big time. Have you ever carried a weeks worth of groceries on public transit? I can reduce my trips considerably by using my own transport. • Don't be a "nanny-city" • People need the convenience of their cars to do things like grocery shopping. No one can carry a week's worth of food on the bus. • Again, people with disabilities. How are they to get around on a schedule that is compatible with their desired life styles? • Vehicles are required for people to conducted business. With this, vehicles are needed before, during and after regular work hours. Vehicles are also required to assist in every day living. With this, the statement doesn't make sense. • NO - NO - NO - NO ! ! ! ! • You have no right to determine my personal activities. • leave our cars alone!! • Make sure the Council members give up their cars first!!!!!!!!!!!!!! • give us a break...you are the product of being allowed to get BS degrees in all the non-sense • Now you're going to tell us when we can and can't use our cars!?!? Is this China? • Let the people decide! They will combine their trips or move to a more

	<p>convenient location for themselves. How can you know what the people want? Let the people speak with their actions and their words.</p> <ul style="list-style-type: none"> Here we go again with the get rid of cars theme. Have answered this question several times.
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Q23. Promote the use of clean alternative motor vehicles and fuels in Sunnyvale to reduce emissions from vehicular travel. - Choose One

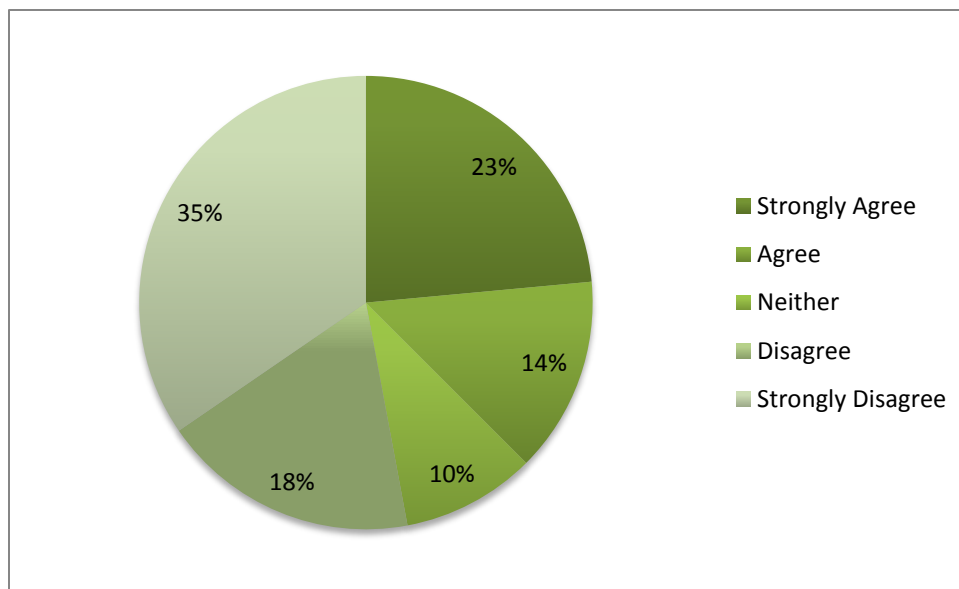


Strongly Agree	<ul style="list-style-type: none"> I'm not sure how you can do that from a planning POV, but if you can, go for it. Yes.... strongly agree E-cars, hybrids, e-scooters, and bicycles! How about getting electrified shuttle buses (like Palo Alto's Marguerite system) for the public? But maybe some way to integrate corporations to help fund this so people can have an easier commute...?
Agree	<ul style="list-style-type: none"> But not through negative incentive for existing types. Installing electric car chargers would be a good idea.
Neither Agree nor Disagree	<ul style="list-style-type: none"> Who is going to pay for the subsidies that will be needed to offset the higher cost of these vehicles and fuel sources? Not me, thank you. how do you intend to accomplish this, a quesstion I have been asking of many of your questions-if it cost the taxpayer more and causes a decrease in productivity and destroys the initiative which might still exist during these rarified times, then I am opposed. Already being done. More vehicles are being driven that reduce emissions. Okay, but for what reason? Sunnyvale's piddly efforts are not going to change one darn thing. What bothers me is you know it and spend our money doing it anyway. Question for you. What is the contribution of

	<p>man-made emissions (assuming there is any measurable amount) to TOTAL green house gas? Embarrassed? I didn't think so, "con" persons seldom are.</p> <ul style="list-style-type: none"> • As long as no added regulations or costs to the residents of Sunnyvale. • This will happen through consumer need. Cars have been redesigned constantly over the last 20 years to enhance mpg and reduce emissions. I believe in the law of diminishing returns - at some point the cost to further enhance efficiency of cars will far exceed the benefit. Look at the numbers, we have made great reductions already. So promotion through simple literature and city website presentations is sufficient. Do not think it productive or fair to do incentives like tax breaks or special perks (HOV lane usage). Also, electric cars will not be the answer - adding lots of additional people and jobs and then electric cars will find us not having enough power for pleasant everyday living. • I don't think it's the city's place to do this other than allow private industry to provide. What if Sunnyvale guesses wrong on these technologies? It will look like a big waste. • how ?
Disagree	<ul style="list-style-type: none"> • Can those low income earners that you just built a high rise for afford the cost. Oh, that's your objective. Can't afford a \$45k electric car = take the bus. • I can see a "revenue stream scheme " written all over this one. Are you thinking of fining people for driving? • What does this mean? What are the clean vehicles? • The only problem with this is the cost of these vehicles. Very few can afford this type of vehicle with the typical over \$25,000.00 price tag. • Vehicles that run on natural gas are OK as long as they are safe. Electric cars still need electricity to run and coal plants still produce most of the electricity in this country but the EPA is determined to shut them down. Then what? • more control
Strongly Disagree	<ul style="list-style-type: none"> • Waste of money. • Have you looked at the cost of these vehicles and their capacity, you must be kidding! • There's a reason why most electric car owners surveyed agreed that they would not purchase another electric car. They are expensive to purchase and even more expensive to maintain. • Not the job of the city government. The residents are adults and citizens, not infants. • The Chevy Volt can only go about 200 miles before needing to be charged for 24 hrs, and it is very expensive. No one knows exactly how to dispose of all the hybrid batteries, which are also very expensive. Much of our corn is being used for fuel instead of food. And we have huge oil and natural gas fields in this country which we need to have access to...so we need to explore that. • The marketplace is where this should be determined. • This is not the city's responsibility

	<ul style="list-style-type: none"> • If these fuels pencil out--people will buy those cars. Don't waste government money trying to re-do the economy. • That wire back to the generating plant only moved your 'reduced emissions' from the vehicle to the power company. To build a battery car involves plenty of emissions, but I suppose it's ok as long as it's someplace else. • Not the City's job to do this, unless they are talking exclusively about their own vehicles. • Electric cars, etc have their own set of problems. • Over-priced and REDICULOUS. • Let's all ride horses.... No wait they poop. Can't have methane gas in our environment! • See my #16 answer. Use your City employee time only on the essential services like police, fire, roads, and parks and libraries. (#1 Where do you think you're getting the money for these things? #2 Our environment is terrific. Have you been to Bangkok or Mexico City? and #3 If the US allowed energy industries to do what they're so good at doing, we wouldn't have an energy shortage.)
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Q24. Design and connect streets in a way to helps people bike, walk and access transit throughout Sunnyvale. - Choose One



General Comments	<ul style="list-style-type: none"> • Most people are not going to walk or bike regardless of what you do; so why waste \$\$ re-doing streets, etc. that already exist? • reconsider routes for garbage etc pickup. The truck routes often disregard more practical/efficient collection routes,.
Strongly Agree	<ul style="list-style-type: none"> • Prioritize pedestrian and biking by decreasing current design that encourage car-oriented traffic. Create roundabouts and pedestrian / bike only streets.

	<ul style="list-style-type: none"> • strongly agree • And more outreach education in schools and neighborhoods about bike safety, not just about helmets but how to behave when biking on the road. Too many people that do not bike have NO IDEA. • SAFE ????
Agree	<ul style="list-style-type: none"> • In general this is a good idea, but not if it's going to be a huge, unproductive proposal such as the El Camino B.R.T. • Neighborhood sidewalks are often bumpy, overgrown, and too narrow for even two people to walk abreast. Wider, safer sidewalks would be a big improvement.
Neither Agree nor Disagree	<ul style="list-style-type: none"> • Let people bike if they WANT to bike let them walk if they want to walk but coercion should NOT be an option. • Cost considerations?? • This is a tough one, what kind of question is this? Makes no sense, you are talking about redesigning streets. Just how would this be done, perhaps another government study? • Do you intend to rebuild the town?
Disagree	<ul style="list-style-type: none"> • As long as roads are due to be repaired this works well. If the city decides to rip up roads in good condition to achieve this goal it will cost the tax payer too much in unneeded repairs. • Crosswalks are great for all. Transit systems already allow bikes on-board. Sunnyvale is not a self-contained city. With this, to spend large sums of tax payer money to accomplish nothing is the waste that should be a concern. • Sounds like Agenda 21. • Who wrote this sentence? And where are we going to be building new streets?
Strongly Disagree	<ul style="list-style-type: none"> • Design and connect streets to make driving efficient. Bikers and walkers will find a way through. • Many of these projects turn out as a futile effort to spend money we do not have and the end result would appear to have been someone's high school project. • No need to do this. Implement suggestion in #16 (Why doesn't Sunnyvale return all land inside the city limits to the way it existed in 1890? That will eliminate traffic and heat from roof tops.) • There is already plenty of infrastructure that is way under-utilized. Once that infrastructure comes closer to capacity use, let's talk about expanding it. • If those of you are truly in favor of the above, then, by all means, plan to accomplish that on your own time, and stop truly to rule other people's lives who don't happen to buy into your particular philosophy • Where does this end? The whole survey is about walking and bikes. I walk 3 to 5 miles a day by choice and am not opposed to biking. These are choices. I would like the roads to be improved for cars which would make pedestrians and bikes safer. • And drive their cars. • Streets are for cars. Streets should be designed and connected to

	<p>facilitate automobile use, If other forms of transport can use the streets without interfering with automobile traffic, so be it . We have had enough of the Diridon philosophy a long time ago. He got a station named after him, Okay, so now let's admit what a transport flop and financial disaster the "trolley" is and move on. America has awakened. Better change horses soon, Change is coming. Watch what happens in Wisconsin..</p> <ul style="list-style-type: none"> • Are you building a new community? Planning for new sprawl? Let's go with what development we have, and mitigate traffic flow case/case. • We are in a recession--the last thing we need is to tear up streets . Waste of money. • Again, the best way for many residents to get around is by the freedom of a car with someone to drive them. • I like Sunnyvale the way it is! • RSTREETS SHOULD BE KEPT AS THEY ARE. AWAY with your "bike and walk trails". A waste of money. I have been walking and biking for years without your expensive (and unused) special bike or walking trails. SIDEWALKS ARE FOR WALKING. Streets (the smaller ones) are great for biking. Some street SHOULD have NO bikes. • Quit it...really. • Another drone question.... • #1 Big Question: Where are you going to get the money? Use your City employee time only on the essential services like police, fire, roads, and parks and libraries. • You just keep reasking the same anti car questions. Do you think people are too stupid and will answer differently each time? • walking and biking should not be prioritized over cars
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CAP Detailed Cost Analysis

The purpose of a more detailed analysis is to provide Council a big picture understanding of the cost commitment associated with the CAP implementation and to help recognize the benefit associated with the costs.

As part of the Implementation Program (Chapter 5) the consultant provided Table 11 – CAP Implementation Matrix. The matrix indicates the projected GHG reduction, implementation timeframe, and generalized costs to the City the community for each main Reduction Measure. The Implementation Matrix generalizes a cost range for each Reduction Measure but does not evaluate each of the 130 Action Items. The CAP indicates a very broad numeric value to each cost range used in the analysis as follows:

Numeric Value (\$)	Range
0	Minimal
1-25,000	Low
25,000-100,000	Low-Medium
100,000-200,000	Medium
200,000-500,000	Medium-High
500,000-1,000,000	High
Over 1,000,000	Very-High

As a resource to Council, staff has categorized and estimated the approximate cost for the Action Items. This more detailed cost analysis is a separate staff task and is not included in the CAP prepared by PMC.

The Action Items were organized by staff into groups based on similarities of cost (e.g. Big Ticket items) or similarity in the type of action (e.g. Education and Outreach or Intergovernmental Coordination).

- Big Ticket Items
- New Code or New Policy Considered
- Education and Outreach
- Existing Code or Policy
- Intergovernmental Coordination
- Changes to Internal City Operations
- Monitoring Costs

A complete list of Action Items by cost category is provided in Appendix A of this attachment.

At this time, the costs for these groups can only be estimated and would be refined based on future analysis of each action and scope of implementation. Unlike a budget, the costs cannot be totaled for a simple overall onetime cost or ongoing annual costs. The CAP is a multi-year program that was prepared with near-term (before 2015), mid-term (before 2020) and long-term (after 2020) time frames for the reduction measures. Since the CAP was delayed, the near-term time frame will be adjusted. Some actions may have one time study costs but the ongoing costs will be determined by how much effort or emphasis Council wants to put on each item such as on education and outreach measures.

Also, since the CAP can be flexible, the implementation time frames are not set in stone. Some mid-term items may jump to near-term depending on how aggressively the City wishes to implement the CAP and vice versa if some near-term items are delayed to pursue other priorities or must be delayed due to budget constraints.

Big Ticket Items

There are 25 Action Items in this category. These items warrant Council attention because of the potential high cost for implementation. The benefits of these big ticket items should be evaluated with consideration of budget priorities, potential outside funding and the amount of possible GHG reductions. Unlike the other Action Item categories where staff applied generalized assumptions, the estimated cost for each item in this category is based on a more focused cost analysis and is derived from current budget information and/or a review of similar programs. Nevertheless, many factors and assumptions affect the potential cost, including the scope of implementation that may be approved by the Council. These items range from \$100,000 to over \$1,000,000. Fifteen of the Action Items involve significant capital improvements or purchases.

Big Ticket Items typically require initial implementation and long-term maintenance or continuing annual costs such as tree maintenance. Some of the Big Ticket Items may be funded by grants, development fees or installed at developers' costs.

The following list highlights the notable "Big Ticket" items that exceed \$1,000,000 (not including on-going maintenance costs.) All costs are preliminary estimates and could vary significantly depending on the level of commitment.

Notable Big Ticket Items:

Description	Action Items	Estimated Cost	Comments
Acquire park land to meet 5.5 acres per 1,000 residents	OS-1.1	\$140M	Additional cost beyond developer provided Park Dedication Fees for 5.0 acres per 1,000 residents
Expand purple pipe system	WC-1.2 & 1.3	\$110M	Likely funded through utility rates and some external funding
Fully fund the Bicycle and Pedestrian Improvement Plans and other related enhancements	CTO-1.4, 1.5, 1.6, 2.4 & 2.5	\$11.3M	In addition to currently funded amount of \$9.6M
Implement the Zero Waste Strategic Plan	LW-2.2	\$2.6M annually	Potentially covered by rate increases
Continue to retrofit City-owned streetlights, park and parking lot lighting for energy efficiency	EC-1.1	\$2.3M	Some grant funding available

The most beneficial strategy in the CAP is to provide a sustainable energy portfolio. Potentially this is a Big Ticket cost item. The CAP identifies that significantly shifting energy consumption away from

traditional electricity and natural gas could achieve up to 58% of the targeted emission reduction goal. In combination with measures supporting alternative renewable energy installations (e.g. solar), this can be achieved by creating or joining a Community Choice Aggregation (CCA) program. CCA is a system enabled by State legislation, which allows cities and counties to aggregate the buying power of individual customers in order to secure alternative or renewable energy supplies.

Consideration of a CCA is a 2014 Study Issue for the Environmental Services Department. The cost associated with this study issues is \$300,000 and would be a preface to a full feasibility study on CCA. Based on early research, a full feasibility study is expected to cost between \$250,000 and \$300,000. This funding is likely to be recoverable through user fees should the City proceed with implementing a CCA. If a CCA program is implemented some Big Ticket items could be deferred until it was determined that they are actually needed to reach the City's GHG reduction goal. These measures, although costly, could stay in the CAP toolkit while other measures are considered or implemented first. If following completion of a feasibility study a CCA program is established, Council could evaluate if other measures could be deleted and still meet the state recommended GHG emissions reduction goals while recognizing that many have other desirable community benefits.

New City Codes or Policies

There are 46 Action Items in this category. These Action Items are those that may require a change to the Municipal Code or to a Council Policy. Some items will require additional study, program design or even a study issue with significant outreach to the community or certain business groups.

About half of these Action Items (22) would require minimal costs or be under \$1,000 to implement. The estimated cost for the remaining 24 Action Items would range from \$5,000 to \$50,000. The precise cost would depend on the type of study needed and the level of staff time required to complete the study. For instance, studies requiring significant public outreach would have higher costs and require more staff hours.

These code/policy changes and studies would likely be prioritized during the annual study issues process or during budget preparation and would be considered along with non-CAP priorities. Doing these studies would not necessarily result in additional costs because, if selected, they could be in lieu of other studies or tasks.

Education and Outreach

There are 25 Action Items in this cost analysis category. These Action Items are those that primarily consist of programs to educate the public or to outreach to the community to solicit involvement in a program. These Action Items may have an enforcement or incentive component.

Most of these programs would have a one-time cost or ongoing annual cost not exceeding \$5,000 to \$10,000. Several (approx. 5) education efforts are anticipated to have annual costs between \$25,000 and \$100,000.

Existing Codes and Policies

There are 11 Action Items in this cost analysis category. The Action Items consist of the continuation of a number of programs, codes, policies or practices. These Action Items typically have no anticipated extra costs. For example:

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.

Residential parking permit programs are already operated in the City on a cost recovery basis so there would be no additional costs for this CAP action. No additional study would be needed. This is a staff managed task.

Intergovernmental Coordination

There are ten Action Items in this cost analysis category. Intergovernmental coordination typically means the City would be joining with or advocating for other agencies or organizations to implement a program that helps reduce GHG emissions. Most of these Action Items are not high cost and primarily consist of staff hours for program coordination or time for communicating advocacy positions. The remaining items would range in cost from \$5,000 to \$25,000, with higher cost items involving more staff hours for implementation, preparation of materials and attendance at meetings. Costs could also include participation monitoring.

Traffic and transportation related Action Items would be coordinated through the Public Works Department where advocacy would be implemented with minimal additional staff costs. For other intergovernmental Action Items, additional staff hours might be needed to accomplish the participation and necessary follow up monitoring depending on the level of commitment directed by Council.

Change to Internal City Operations

There are 13 Action Items in this cost analysis category. This category consists of actions such as updating City documents and internal programs to reflect the CAP such as incorporating the concepts of adaptation into emergency preparedness plans or changing materials used in City sidewalk and street construction to a more sustainable product. This category is also a catch all for Action Items related to the way the City does business that did not exactly fit into another category.

Most of these Action Items are minimal cost to the City (below \$5,000). The only higher cost Action Item would be to host special pedestrian and bicycle events if there is no grant or local business sponsor.

This category will require the City's Sustainability Coordinator to update and implement the City's plans to respond to climate adaptation when appropriate. Additional costs would be associated with participating in regional adaptation planning and implementation of some programs like the Urban Water Management Plan.

Monitoring Costs

The CAP includes Action Items that address monitoring as well as periodically updating the GHG inventory. Based on preliminary research, a monitoring tool would range from \$15,000 to \$50,000 depending on the level of sophistication and reporting desired. Monitoring requires the City to develop a systematic method to and track and report on the GHG reduction goals that are quantified in the CAP. Establishing a monitoring program will be one of the first implementation steps if the CAP is adopted. Regular monitoring will be required in order to be accountable for CEQA streamlining and to take advantage of potential grant funding for GHG emission reduction activities. Staff will return to Council with a recommendation on purchasing a monitoring program, which would be customized to measure performance of the 130 Action Items in the Sunnyvale CAP.

Impl'n Category	Measure ID	Activity ID	Activity Description
BT	BIG TICKET ITEMS		
BT	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.
BT	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.
BT	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.
BT	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, create 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.
BT	CTO-2	CTO-2.4	Fully fund the City's bicycle and pedestrian improvement plans for completion by 2035.
BT	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.
BT	CTO-3	CTO-3.1	Continue sponsoring projects to provide transit rider amenities at bus stops and rail stations.
BT	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.
BT	CTO-4	CTO-4.2	Create a Transportation Demand Management (TDM) program for City staff to promote alternative transportation modes and carpooling to the greatest extent possible.
BT	CTO-5	CTO-5.1	Support the creation of walking school bus programs in coordination with schools and parent organizations.
BT	EC-1	EC-1.1	Replace City-owned streetlights, park, and parking lot lighting with energy efficient lighting such as Light Emitting Diode (LED) or induction lights as technology becomes more affordable and return on investment is less than five years.
BT	EC-5	EC-5.1	Require new construction and major remodels to install interior real-time energy monitors.
BT	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.
BT	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 Downtown and in proximity to other commercial areas.
BT	LUP-1	LUP-1.4	Establish parking meters throughout downtown Sunnyvale to optimize parking availability and reduce unnecessary vehicle circulation.
BT	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.
BT	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.
BT	OS-1	OS-1.1	Achieve and maintain an open space to population ratio of 5.5 acres per 1,000 residents.
BT	OS-3	OS-3.4	Expand existing park, open space, and boulevard tree inventory through the replacement of trees with greater number of trees when trees are removed due to disease, park development or other reasons.
BT	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.
BT	OVT-1	OVT-1.4	Increase the number of efficient or alternatively fueled vehicles in the City fleet as vehicles are turned over.
BT	OVT-1	OVT-1.8	Accommodate neighborhood electric vehicles (NEVs) by providing infrastructure and regulations consistent with the California Vehicle Code and the Manual of Uniform Traffic Control Devices (MUTCD).
BT	OVT-3	OVT-3.1	OVT-3.2. Increase signal coordination as warranted to facilitate traffic flow along arterials and major collectors.

Impl'n Category	Measure ID	Activity ID	Activity Description
BT	WC-1	WC-1.2	Promote 'purple pipe' (reclaimed water) infrastructure in new construction or major renovation in preparation for a growing, usable network.
BT	WC-1	WC-1.3	Create a purple pipe network for citywide use of recycled water for irrigation and other outdoor purposes.

CO NEW CODES OR POLICIES			
CO	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.
CO	A-3	A-3.2	Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.
CO	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.
CO	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.
CO	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.
CO	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.
CO	CTO-4	CTO-4.1	Require existing and future major employers to utilize a variety of Transportation Demand Management (TDM) measures including flexible work schedules, telecommuting, guaranteed rides home, low or no-cost transit passes, parking "cash-out" incentives, and other programs that connect employees with alternatives to single occupant commutes.
CO	EC-1	EC-1.3	Require new private parking lot lighting to use energy efficient lighting technologies.
CO	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 consistent with upgrades to the California Green Building Standards Code (CALGreen).
CO	EC-3	EC-3.1	Establish a residential energy conservation ordinance that requires homeowners to perform and disclose energy and water audits at time of sale.
CO	EC-4	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
CO	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, time of sale upgrades, and/or innovative partnershipsto reduce energy use.
CO	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.
CO	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.
CO	EP-2	EP-2.1	Require new homes and businesses and major remodels to be 'solar ready' by pre-wiring for solar hot water heating and solar electricity.
CO	EP-2	EP-2.3	Prevent buildings and additions from shading more than 10% of roofs of other structures.
CO	EP-2	EP-2.5	Maintain incentives for alternative energy installations in new and existing development, including solar and small-scale wind turbines.
CO	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 complimentary hours of operation.
CO	LUP-1	LUP-1.3	Implement parking management tools for residential uses such as decreased or flexible standards, unbundled parking and shared parking plans.
CO	LUP-2	LUP-2.3	Facilitate the development of affordable housing near transit.
CO	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.
CO	LUP-3	LUP-3.1	Amend the Zoning Code to allow small-scale, commercial urban farms to operate in residential areas.

Impl'n Category	Measure ID	Activity ID	Activity Description
CO	LUP-3	LUP-3.2	Ensure that every village core has opportunities for growing produce locally.
CO	LUP-3	LUP-3.3	Establish community gardens for public use.
CO	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.
CO	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.
CO	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.
CO	LW-1	LW-1.1	Reduce the use of plastic bags at grocery stores and convenience stores in the community through incentives or requirements.
CO	LW-1	LW-1.3	Ban the use of expanded polystyrene (EPS) take-out containers at restaurants and fast food facilities.
CO	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.
CO	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.
CO	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.
CO	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
CO	OS-3	OS-3.2	Develop and implement canopy coverage requirements for City-owned parking lots, with exceptions for solar installations.
CO	OS-3	OS-3.3	Promote tree planting on private property through incentive and support programs.
CO	OS-3	OS-3.5	Clarify codes and policies to maximize the preservation of the largest longest living trees and insure the expansion of the urban forest over time as appropriate for the site
CO	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.
CO	OVT-1	OVT-1.3	Require sufficient electrical service in the garages/parking facilities of new residential development to support electric vehicle charging.
CO	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.
CO	OVT-1	OVT-1.7	Facilitate new fueling stations that offer alternative fuels.
CO	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.
CO	WC-1	WC-1.1	Prepare a feasibility study to expand the City's current recycled water program citywide and improve the quality of recycled water to expand potential uses to industrial facilities or other applications.
CO	WC-1	WC-1.4	Create flexible provisions and encourage residents and businesses to collect rainwater to use for irrigation purposes.
CO	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%.
CO	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.
CO	WC-2	WC-2.3	Require new open space and street trees to be drought tolerant.

Impl'n Category	Measure ID	Activity ID	Activity Description
EO	EDUCATION AND OUTREACH		
EO	A-4	A-4.1	Dedicate a page of the City's website to climate change and climate change adaptation.
EO	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.
EO	CA-1	CA-1.10	Use the City's Sustainability Commission and coordinator as a structure to coordinate with other groups for volunteers, residents, and other organizations to help achieve Sunnyvale's sustainability goals.
EO	CA-1	CA-1.11	Actively engage with Sunnyvale businesses to identify areas for GHG reduction and financial savings.
EO	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.
EO	CA-1	CA-1.3	Develop and encourage a mechanism for neighborhoods to share equipment and resources to improve sustainability.
EO	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.
EO	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.
EO	CA-1	CA-1.6	Use sustainability initiatives within City operations to educate the community of ways to achieve sustainability by example.
EO	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.
EO	CA-1	CA-1.8	Through selected projects and efforts to improve City operations, demonstrate how sustainability efforts are possible and successful.
EO	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.
EO	CA-2	CA-2.1	Recommend and advocate for schools to use the Air District curriculum or other for local school teachers to teach children about climate change, greenhouse gas emissions, and local actions.
EO	CA-2	CA-2.2	Continue to provide and improve the bicycle driver education program for elementary, middle, and high school students.
EO	CTO-2	CTO-2.2	Require secure bicycle parking at public and large private events.
EO	CTO-2	CTO-2.7	Support business efforts to plan and implement a bike-sharing program for major commercial and industrial areas.
EO	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.
EO	CTO-5	CTO-5.3	Continue to implement a Safe Routes to School program for increased bicycle and pedestrian safety to and from schools.
EO	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.
EO	EC-5	EC-5.2	Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.
EO	EC-5	EC-5.3	Inform the community of metering options, such as online applications and in-home monitors.
EO	OR-2	OR-2.2	Construction equipment must be maintained per manufacturer's specifications
EO	OVT-1	OVT-1.5	Collaborate with taxi franchises to use low-emissions vehicles such as hybrids, compressed natural gas (CNG) vehicles, biodiesel vehicles, or electric vehicles.
EO	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.
EO	OVT-3	OVT-3.2	Educate and enforce idling restrictions associated with delivery trucks and school pick-ups and drop-offs.

Impl'n Category	Measure ID	Activity ID	Activity Description
IC INTERGOVERNMENTAL COORDINATION			
IC	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.
IC	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.
IC	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.
IC	CTO-3	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.
IC	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 3-7 years.
IC	EC-3	EC-3.2	Participate in a Property Assessed Clean Energy (PACE) or similar financing program to offer low-interest loans to residents and businesses for energy efficiency upgrades.
IC	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.
IC	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.
IC	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.
IC	OR-1	OR-1.1	Partner with BAAQMD to re-establish a voluntary exchange program for residential electric lawnmowers and backpack-style leaf blowers.

IP INTERNAL OPERATION OR POLICY			
IP	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.
IP	A-2	A-2.2	Update the City Emergency Plan and Emergency Preparedness Workbook to address climate change impacts.
IP	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.
IP	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.
IP	CTO-2	CTO-2.6	Create at least one day a year when a portion of streets and plazas are designated for pedestrian and/or bicycle access only.
IP	CTO-4	CTO-4.4	Explore programs to encourage large employers to hire Sunnyvale residents.
IP	EC-3	EC-3.3	Prioritize non-general funds to assist low-income home owners achieve energy efficient improvements. Program annual Community Development Block Grant (CDBG) funds to fund weatherization programs.
IP	EC-6	EC-6.3	Commit to using a warm aggregate mix for all asphalt patching, overlay, and reconstruction.
IP	EC-6	EC-6.4	Consider the lifespan and embedded GHG content of pavement materials for public projects.
IP	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.
IP	LUP-4	LUP-4.1	Support the retention and expansion of local anchor and growth industries.
IP	LW-1	LW-1.2	Ban the sale or dispersal of disposable, single use plastic water bottles at public events permitted by the City.
IP	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.

PO EXISTING CODE OR POLICY			
PO	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.
PO	LW-2	LW-2.1	Require multi-family homes to participate in the City's Multi-family Recycling Program
PO	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.

Impl'n Category	Measure ID	Activity ID	Activity Description
PO	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.
PO	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.
PO	EC-2	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.
PO	EP-2	EP-2.4	Continue to allow and encourage solar facilities above paved parking areas.
PO	LUP-2	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.
PO	LUP-2	LUP-2.2	Continue to identify underutilized areas that can support higher density housing and mixed-use development.
PO	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.
PO	OS-3	OS-3.1	Continue to implement the City's Tree Preservation requirements.

LEGEND

BT	BIG TICKET
CO	NEW CODE OR POLICY
EO	EDUCATION AND OUTREACH
IC	INTERGOVERNMENTAL COORDINATION
IP	INTERNAL OPERATION OR POLICY
PO	EXISTING CODE OR POLICY

“Just Do It” Action Items
and
Items Already in Progress

JUST DO IT

The following Actions Items can be initiated by staff as conditions of approval in discretionary projects without further Council consideration if the CAP is adopted:

Off Road Equipment (OR)

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.

OR 2.2: Construction equipment must be maintained per manufacturer’s specifications.

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.

ALREADY IN PROGRESS

The following list includes Action Items that the City has already incorporated into its practices, guidelines, codes and policies. Staff will continue to implement these Action Items and will come to Council as necessary to modify or strengthen them to reach the CAP goals:

Open Space and Urban Forestry (OS)

OS 3.1: Continue to implement the City's Tree Preservation requirements.

Decrease Energy Consumption (EC)

EC 1.3: Require new private parking lot lighting to use energy-efficient lighting technologies.

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 consistent with upgrades to the California Green Building Standards Code (CALGreen).

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.

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.

EC 3.3: Prioritize non-general funds to assist low-income home owners achieve energy efficient improvements. Program annual Community Development Block Grant (CDBG) funds to fund weatherization programs.

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.

Provide a Sustainable Energy Portfolio (EP)

EP 2.3: Prevent buildings and additions from shading more than 10% of roofs of other structures.

EP 2.4: Continue to allow and encourage solar facilities above paved parking areas.

EP 2.5: Maintain incentives for alternative energy installations in new and existing development, including solar and small-scale wind turbines.

Decrease Water Consumption (WC)

WC 1.1: Prepare a feasibility study to expand the City's current recycled water program citywide and improve the quality of recycled water to expand potential uses to industrial facilities or other applications.

Reduce Landfill Waste (LW)

LW 1.1: Reduce the use of plastic bags at grocery stores and convenience stores in the community through incentives or requirements.

LW 1.3: Ban the use of expanded polystyrene (EPS) take-out containers at restaurants and fast food facilities

LW 2.1: Require multi-family homes to participate in the City's Multi-family Recycling Program

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.

Improve Mobility through Land Use Planning (LUP)

LUP 1.3: Implement parking management tools for residential uses such as decreased or flexible standards, unbundled parking, and shared parking plans.

LUP 1.5: Retain residential parking permit programs for residential areas adjacent to commercial areas of the city where parking is in higher demand.

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 2.2: Continue to identify underutilized areas that can support higher density housing and mixed-use development.

LUP 2.3: Facilitate the development of affordable housing near transit.

LUP 2.5: Continue to allow for the development of live/work spaces in commercial zoning districts and mixed-use residential zoning districts.

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.

LUP 5.1: Encourage the establishment and even distribution of neighborhood-serving facilities such as day care providers, banking/ATM locations, markets, and drugstores in existing residential, commercial, and industrial areas in order to reduce the need for vehicle trips.

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, and shopping.

Expand Sustainable Circulation and Transportation Options (CTO)

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

CTO 3.1: Continue sponsoring projects to provide transit rider amenities at bus stops and rail stations.

CTO 5.3: Continue to implement a Safe Routes to School program for increased bicycle and pedestrian safety to and from schools.

Optimize Vehicular Travel (OVT)

OVT 1.3: Require sufficient electrical service in the garages/parking facilities of new residential development to support electric vehicle charging.