CUPERTINO

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City of Cupertino

Climate Action Plan 2.0

Cupertino Climate Action Plan 2.0

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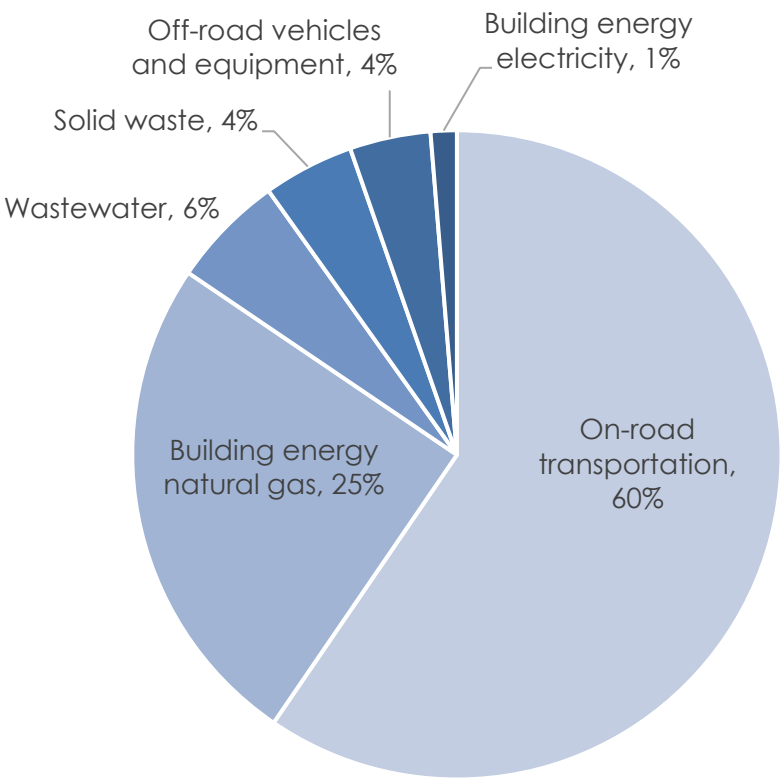
Executive Summary

Cupertino is leading an effort to take meaningful action to reduce greenhouse gas (GHG) emissions and mitigate climate change impacts. The goal is to improve the wellbeing of the community by preparation of this communitywide Climate Action Plan (CAP) 2.0. The following is a high-level summary of GHG emissions levels, projected emissions levels, established emissions targets, and GHG reduction and climate adaptation measures for Cupertino to achieve the targets.

Cupertino Current GHG Emissions Inventory

The 2018 Community Greenhouse Gas (GHG) Emissions Inventory for Cupertino indicates that total emissions were 346,998 metric tons of carbon dioxide equivalents (MT CO_2e), which translates into approximately 5.48 MT CO_2e per person. Figure ES-1 below shows the share of total emissions for each sector of the community.

Figure ES 1. Cupertino Greenhouse Gas Emissions by Sector, 2018



Cupertino Projected GHG Emissions Forecasts

Future Cupertino GHG emissions levels are projected based on current emissions, job growth, and estimated population growth trends. Established State regulations that will take effect during the period will reduce the expected emissions and are incorporated into the projections. Cupertino's future emissions are projected to be 5.04 MT CO_2e/person in 2030 and 4.74 MT CO_2e/person in 2040. The total forecasted emissions per community sector are shown for each target year in Figure ES-2 below.

Cupertino GHG Emissions Targets

The Cupertino CAP 2.0 has targeted communitywide carbon neutrality by 2040 in line with the emergency climate declaration made by the City Council in 2018 and in support of state and international climate goals. In order to achieve this, the following targets have been set for Cupertino's future emissions: 3.39 MT CO_2e per person by 2030 and 0.00 MT CO_2e per person by 2040. The emissions reduction pathway over the coming decades is illustrated in Figure ES-3, below. Together, the measures and actions in the CAP 2.0 provide Cupertino with the GHG reductions necessary to achieve Cupertino's 2030 climate action target as shown in Table ES-1. However, the 2040 GHG emissions reductions quantified are not yet enough to meet the City's longer-term 2040 climate action target of carbon neutrality. This CAP 2.0 aims to establish new systems that are resilient and equitable and make substantial progress towards carbon neutrality in the future. Future CAP updates past 2030 will also outline new measures and actions that Cupertino will implement to close the remaining gap to achieve the carbon neutrality target.

The Cupertino climate action targets are more aggressive than the state-level goals. The community and City Council have consistently demonstrated climate action leadership and put forward resources to set an example.

Chapter Five has all the details on goal-setting and the target path to a carbon-neutral city.

Figure ES 2. Forecasted Emissions per Capita by Sector for the Baseline Year 2018, and Projected for 2030 and 2040

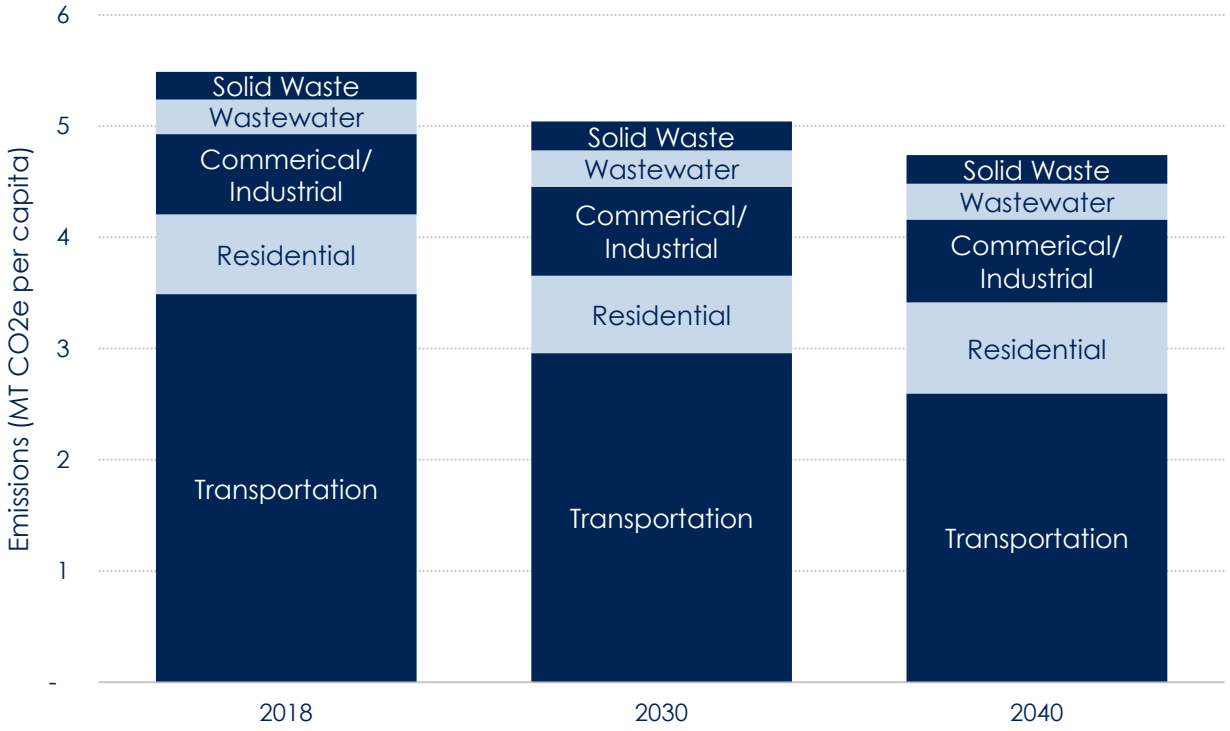


Figure ES 3. Per Capita Baseline Emissions Compared to Forecast Scenario and Target Pathway to Carbon Neutrality

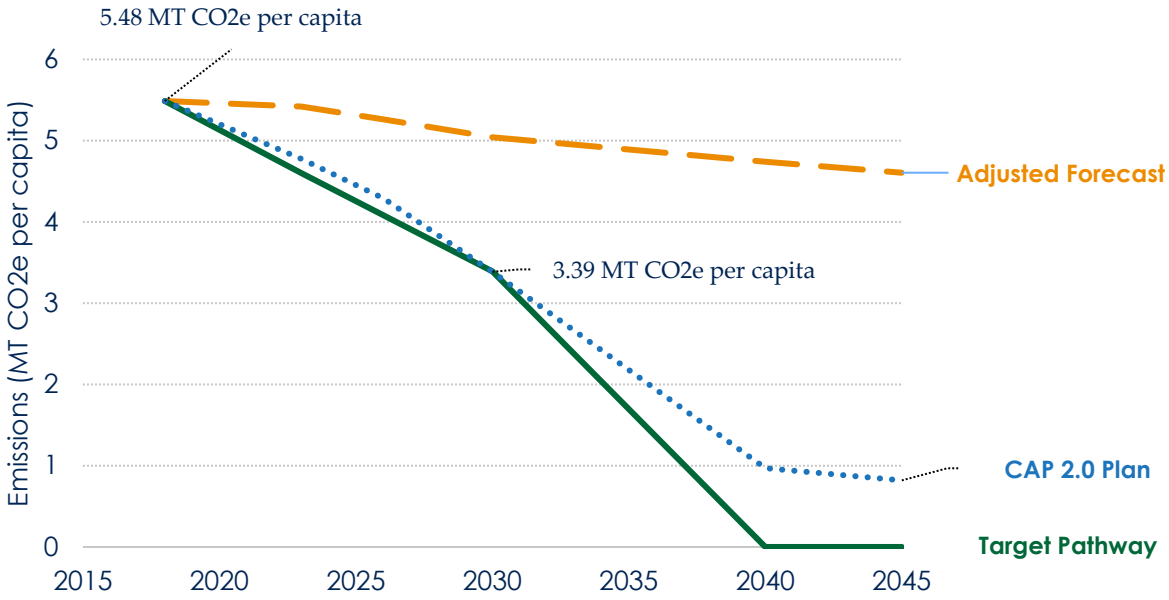


Table ES-1 Targets Versus Greenhouse Gas Reductions

Target/Forecast	2030 GHG Emissions (MT CO_2e/person)	2040 GHG Emissions (MT CO_2e/person)
Business-as-usual Forecast	5.77	5.91
Adjusted Forecast	5.04	4.74
Climate Action Targets	3.39	0.00
GHG Emissions Reductions from Full Implementation of Measures	1.66	3.77
GHG Emissions after Measure Reductions	3.39	0.97
Target Anticipated to be Met?	Yes	No; substantial progress demonstrated

Climate Change Impacts and Adaptation

The City has identified six hazards of concern: adverse air quality impacts, extreme heat, extreme precipitation/storm flooding, wildfire, drought, and sea level rise. Several impacts of these hazards are being felt now and are projected to intensify in the future. Based on an analysis of potential impacts and the City's adaptive capacity, Cupertino is most vulnerable to adverse air quality impacts and extreme heat, and the City has medium vulnerability to drought, wildfire, and extreme precipitation/storm flooding. Cupertino is least vulnerable to sea level rise, however indirect effects from sea level rise may be felt in the region.

To protect people, assets, and natural systems, the City is engaging in climate adaptation. This is defined as responding to actual or expected climate impacts, with the goal of mitigating harms or taking advantage of opportunities. Further information on climate adaptation, our vulnerability assessment, and adaptation measures are found in Chapter 12.

Cupertino CAP 2.0 Measures to be Implemented by 2030

Implementation of the following suite of measures would result in Cupertino achieving its 2030 target of 3.39 MT CO_2e per person. Additional measures will be required as part of future CAP update to attain the longer-term goal of carbon neutrality by 2040.[1]

Each measure is supported by a suite of actions that will help to achieve the completion of that measure. The measures and actions have been designed using principles called key pillars that ensure that changes are robust, effective, and inclusive.

Key pillars include partnerships, equity, financing, structural change, and engagement and are discussed in more detail in Section 7.4 of the CAP 2.0. The measures and actions have been assessed by the community throughout the CAP 2.0 update process.

The CAP 2.0 measures are the specific steps that serve two primary purposes:

- climate mitigation through reduced GHG emissions and,
- adaptation to those impacts of climate change that may be unavoidable.

[1] Association of Environmental Professionals (AEP). "The California Supplement to the United States Communitywide Greenhouse Gas (GHG) Protocol". 2013. Available: https://califaep.org/docs/California_Supplement_to_the_National_Protocol.pdf . Accessed February 2022; and California Air Resources Board (CARB). "California's 2017 Climate Change Scoping Plan". Available: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf . Accessed February 2022.

Figure ES 4 Expected 2040 Impact by Sector From CAP 2.0 Measures

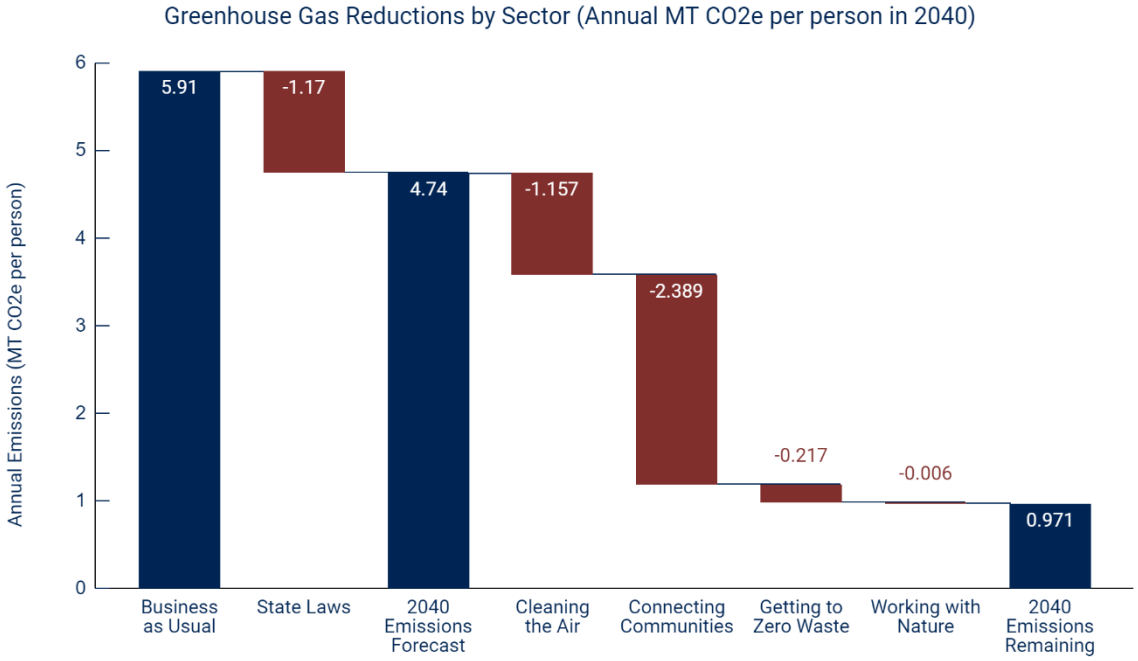


Table ES-2 CAP 2.0 GHG Emissions Reduction Measures Overview

No.	Measure	MT CO2e Reduction Per Person*
BE-1	Reduce non-SVCE usage rate to 2% for residential and 10% for commercial by 2030 and maintain through 2040	2030: 0.012 2040: 0.004
BE-2	Electrify existing residential buildings to reduce annual residential natural gas usage from 129 therms per person in 2018 to at most 71 therms per person in 2030 and 16 therms per person in 2040	2030: 0.290 2040: 0.566
BE-3	Electrify existing commercial buildings to reduce annual commercial natural gas usage from 119 therms per person in 2018 to at most 90 therms per person in 2030 and 54 therms per person in 2040	2030: 0.190 2040: 0.366
BE-4	Require new residential and commercial development to be all-electric at time of construction	2030: 0.067 2040: 0.221
BE-5	Develop specific requirements for procurement of carbon-free fuels in lieu of natural gas for new projects that cannot be electrified	Supportive
TR-1	Develop and implement an Active Transportation Plan to achieve 15% of active transportation mode share by 2030 and 23% by 2040	2030: 0.048 2040: 0.071
TR-2	Implement public and shared transit programs to achieve 29% of public transit mode share by 2030 and maintain through 2040	2030: 0.269 2040: 0.256
TR-3	Increase zero-emission vehicle (ZEV) adoption to 35% for passenger vehicles and 20% for commercial vehicles by 2030 and 100% for all vehicles by 2040	2030: 0.457 2040: 1.960
TR-4	Re-focus transportation infrastructure away from single-occupancy gasoline vehicles to support the bicycle/pedestrian, public transit, and ZEV goals of Measures TR-1, TR-2, and TR-3	Supportive
TR-5	Electrify or otherwise decarbonize 34% of off-road equipment by 2030 and 35% by 2040	2030: 0.098 2040: 0.102
W-1	Implement SB 1383 requirements and reduce communitywide landfilled organics 75% by 2025 and inorganic waste 35% by 2030 and reduce all waste 90% by 2040	2030: 0.202 2040: 0.200
W-2	Reduce overall waste disposed to garbage, recycling, and compost per capita by 15% by 2035	Supportive

No.	Measure	MT CO2e Reduction Per Person*
WW-1	Reduce per capita water consumption 15% compared to 2019 levels by 2030 and maintain through 2040	Supportive
WW-2	Support the SJ-SC RWF in implementing GHG emissions reduction projects	Supportive
Carbon Sequestration Measures		
W-3	Meet or exceed the SB 1383 recycled organics products procurement requirements and sequester or avoid at least 0.018 MT CO_2e per person by through 2045	2030: 0.018 2040: 0.018
CS-1	Increase carbon sequestration through tree planting by developing and implementing an Urban Forest Management Plan	Supportive
CS-2	Leverage the carbon sequestration potential of open space and carbon removal	Supportive
Adaptation and Resilience Measures		
AR-1	Increase usage of natural infrastructure solutions such as bioswales, rainwater storage systems, and permeable pavements to enhance infrastructure resiliency	Supportive
AR-2	Bolster emergency preparedness and response by integrating climate adaptation and improving climate-related communications	Supportive
AR-3	Strengthen community capacity and resilience through education, resources, and policies	Supportive
AR-4	Update the Adaptation Strategy and Action Plan in Coordination with the County of anta Clara	Supportive

* Measures and actions marked as "supportive" may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction, they are not quantified for one of several factors. Refer to Section 7 for more information.

1 Vision and Purpose

1.1 Cupertino CAP 2.0 Vision Statement

Vision

Cupertino envisions a future with cleaner air, resilient and renewable energy sources, livable communities, an equitable distribution of resources, and opportunities to build and maintain resilient homes and businesses. Climate change poses a challenge to that vision and the effects of climate change are already impacting California communities on the local level.

The impacts of climate change are projected to worsen over the next century if there is not a concerted global effort to address the cause of climate change by reducing greenhouse gas (GHG) emissions. The City of Cupertino recognizes the need for ambitious climate action. On September 18, 2018, the City passed Resolution No. 18-094, declaring a climate emergency. This resolution calls for an emergency mobilization effort to end communitywide GHG emissions as quickly as possible, educate residents about climate change, and advocate for a mass mobilization at the local, State, national, and global levels. This Climate Action Plan (CAP) 2.0 supports that resolution and builds on the progress achieved in Cupertino's 2015 CAP by providing an updated roadmap of specific actions to reduce GHG emissions, achieve the City's target of carbon neutrality by 2040, and increase community resilience, and capacity to adapt to the impacts of climate change.

In addition to emission reduction strategies this CAP 2.0 details strategies for Cupertino to prepare for and mitigate approaching risks and charts the course towards a prosperous and sustainable future. By achieving carbon neutrality, Cupertino will contribute its fair share to address the climate crisis and support international climate goals limiting global temperature rise. This target is consistent with the United Nations International Panel on Climate Change (IPCC) analysis on what is necessary to reduce the likelihood of catastrophic global climate change. Addressing climate change also presents Cupertino with an opportunity to build a vibrant future aligned with the key principles outlined below.

Guiding Principles

The following principles are key to achieving the vision for the CAP 2.0 and were adopted by the Cupertino Sustainability Commission and City Council in December of 2020:

- **Equity:** Activate and celebrate the multiracial character of Cupertino. Take every effort to include traditionally under-represented voices and those who might be displaced by climate hazards in the planning and selection of strategies, as well as business, faith groups, neighborhoods, and schools. Create a plan that reflects the diversity of the city and sets us on a path towards a more welcoming and inclusive Cupertino.
- **Innovation**: Develop measures in short-term and long-term action plans that position Cupertino as a leader in climate innovation and technological development, new ways of working and studying, and commit to educating the community on innovative strategies at least once a year.
- **Urgency and Flexibility**: Establish a frequent cadence of updates to the near-term action plans, with the aim to both focus community resources and stay flexible in a fast-moving world. Work with haste commensurate with the Climate Emergency Declaration that Council adopted in 2018 and the unprecedented opportunity that climate and waste plans present to our community by taking bold steps in the early planning horizon.
- **Resilience and Adaptation:** Establish climate adaptation measures such as green infrastructure and protecting biodiversity that keeps Cupertino residents and businesses safe, productive, and happy while climate risks accelerate.

Purpose

Climate Action

This CAP 2.0 will guide Cupertino towards reducing GHG emissions in a manner that exceeds the State goal to reduce GHG emissions 40 percent below 1990 levels by 2030, established by California Senate Bill (SB) 32. This CAP 2.0 will also put the City on a trajectory to meet or exceed the State goal of achieving carbon neutrality by 2045, established by California Executive Order B-55-18. See Appendix A for a written description and a timeline of relevant climate action planning regulations.

Specifically, Cupertino has a target to reduce total emissions 45 percent below 1990 levels by 2030, exceeding the State 2030 target. This translates into a GHG emissions reduction of 179,772 MT CO_2e total (or 6.68 MT CO_2e per person). Cupertino also has a goal of carbon neutrality (i.e., net zero MT CO_2e person) by 2040, again exceeding the State carbon neutrality target.

CEQA GHG Emissions Analysis Streamlining

The CAP 2.0 fulfills the requirements of California Environmental Quality Act (CEQA) Guidelines Section 15183.5(b) to be considered a "qualified" GHG reduction plan.[2] Creating and updating this CEQA qualified plan is in accordance with Cupertino General Plan – Environment and Sustainability Element.

In compliance with CEQA and State CEQA Guidelines, local agencies must evaluate the environmental impacts of new development projects or plans, including impacts related to GHG emissions associated with the construction and operation of projects or plans. This process can be cumbersome for local agencies and developers alike and can result in project delays. The CEQA Guidelines provide an option for new projects to streamline the CEQA analysis of GHG emissions by tiering from a qualified GHG reduction plan.

This CAP 2.0 and its associated CEQA environmental assessment documentation are consistent with the criteria set forth in CEQA Guidelines Section 15183.5(b) as summarized in Table 1. As such, this CAP Update is considered a qualified GHG reduction plan.

Table 1 CEQA Guidelines Section 15183.5(b) Criteria Addressed in CAP Update

CEQA Criteria	CAP Update Chapter Addressing Criteria
1. Quantify existing and projected GHG emissions within the plan area	Chapter 4
2. Establish a reduction target consistent with State targets	Chapter 5
3. Identify and analyze sector specific GHG emissions from specific actions or categories of actions anticipated within the geographic area	Chapter 4 Appendix B
4. Specify measures and actions that substantial evidence demonstrates would collectively achieve the specified reduction target	Chapters 8, 9,10,11

[2] Governor's Office of Planning and Research (OPR), "General Plan Guidelines - Chapter 8: Climate Change," Available: https://opr.ca.gov/docs/OPR_C8_final.pdf. Accessed November 2021.

CEQA Criteria	CAP Update Chapter Addressing Criteria
5. Establish a mechanism to monitor progress and amend the plan if it is not achieving specified emissions levels	Chapter 13
6. Adopt in a public process following environmental review	See associated CEQA environmental assessment documentation

If future projects are consistent with this CAP 2.0 in terms of GHG emissions construction and operational levels as well as consistent with the questions and requirement of the associated CAP Consistency Checklist (i.e., Cupertino CEQA GHG Checklist), future CEQA GHG emissions impact analyses can be streamlined with a qualitative rather quantitative CEQA GHG emissions analysis and with presumption that the project or plan's GHG emissions are not considered cumulatively significant under CEQA.

1.2 Cupertino Declaration of Climate Emergency

In recognition of the urgent and existential nature of climate change, the City of Cupertino declared a climate emergency with the passage of Resolution No. 18-094 on September 18, 2018. In addition to calling for an emergency mobilization effort to halt greenhouse gas emissions at the local level, the resolution calls on the State of California, the United States, and all governments worldwide to initiate emergency mobilization efforts to mitigate climate change, stop rising GHG emissions, and safely draw down carbon from the atmosphere.

As part of the resolution the City of Cupertino committed to keeping equity central to the climate mobilization planning process by encouraging community engagement and participation. The development process for this CAP 2.0 and the measures are aligned with this mission. Please refer to Chapter 6 for more detail about the planning process and how public input was incorporated into this CAP 2.0.

2 Scientific Context and Impacts

2.1 Climate Change Science

The Greenhouse Gas Effect and Climate Change Problem

Earth's climate is largely driven by energy that comes from the sun. When solar radiation reaches the Earth's atmosphere, some of it is reflected into space and a portion is absorbed by the Earth's surface. As the Earth absorbs solar radiation, its surface heats up and re-radiates heat back out into the atmosphere.[3] While some of the heat escapes past the atmosphere into space, gases in the atmosphere prevent the loss of some of the heat. Without some GHGs in the atmosphere, the Earth would not be warm enough to sustain life as we know it. This heat trapping quality of gases in Earth's atmosphere is known as the greenhouse effect. The gases trapping the heat are known as greenhouse gases (GHG).[4] Increased levels of specific GHG in the atmosphere means that less heat escapes to space. More heat trapped in the atmosphere leads to much more than hotter average temperatures also known as global warming, which in turn contributes to more intense storms, drought, extreme heat events, and sea level rise. [5] These effects are considered climate change.

Human-caused climate change is well understood and widely accepted by the scientific community, with over 97 percent of climate scientists agreeing that the planet is warming and human activities are the root cause.[6] Human activities have raised the levels of GHGs in the atmosphere from 280 parts per million to over 410 parts per million in the last 150 years.[7] Although many changes to climate are governed by natural processes, human activities have added GHGs to the atmosphere at a rate that is unprecedented in Earth's

[3] NASA. "The Causes of Climate Change," Climate Change: Vital Signs of the Planet. Available: https://climate.nasa.gov/causes. Accessed December 2021

[4] UCAR. "The Greenhouse Effect | Center for Science Education," Available: https://scied.ucar.edu/learning-zone/how-climate-works/greenhouse-effect. Accessed December 2021.

[5] IPCC. "Summary for Policymakers — Global Warming of 1.5 °C. Available: https://www.ipcc.ch/sr15/chapter/spm/. Accessed December 2021.

[6] NASA. "Scientific Consensus: Earth's Climate Is Warming," Climate Change: Vital Signs of the Planet. Available: https://climate.nasa.gov/scientific-consensus. Accessed December 2021.

[7] J. Blunden and T. Boyer, "State of the Climate in 2020," *Bulletin of the American Meteorological Society* 102, no. 8. 2021. Available: https://doi.org/10.1175/2021BAMSStateoftheClimate.1. Accessed December 2021.

history, leading to CO2 levels that are now higher than they have been any time in the past 800,000 years.[8]

Globally, climate change is already impacting both human and natural systems. Scientists have measured shrinking ice sheets, warming, and acidifying oceans, increasing global temperatures, less snow cover, sea level rise, and species extinction. The potential consequences of these climate change related impacts include the flooding of low-lying areas, reduction of fresh-water supply, adverse changes to biological resources and public health, as well as many other adverse environmental consequences.[9]

Globally, a warming trend is abundantly clear, with nineteen of the hottest years on record occurring since 2000.[10] The year 2020 tied with 2016 for the hottest year on record since record-keeping began in 1880, and these trends are consistent across numerous monitoring agencies and data sets.[11]

Though climate change is a global phenomenon it has the potential to impact facets of society on the local level including health outcomes, natural resource access, infrastructure, emergency response, tourism, and frequency of disasters. The United Nations Intergovernmental Panel on Climate Change (IPCC) projections show that a reduction in GHG emission to carbon neutrality by mid-century is required to limit warming trends to 1.5 degrees Celsius and avoid the worst impacts of climate change.12 In order to do this, action must be taken at all levels of society to reduce emissions of greenhouse gases.

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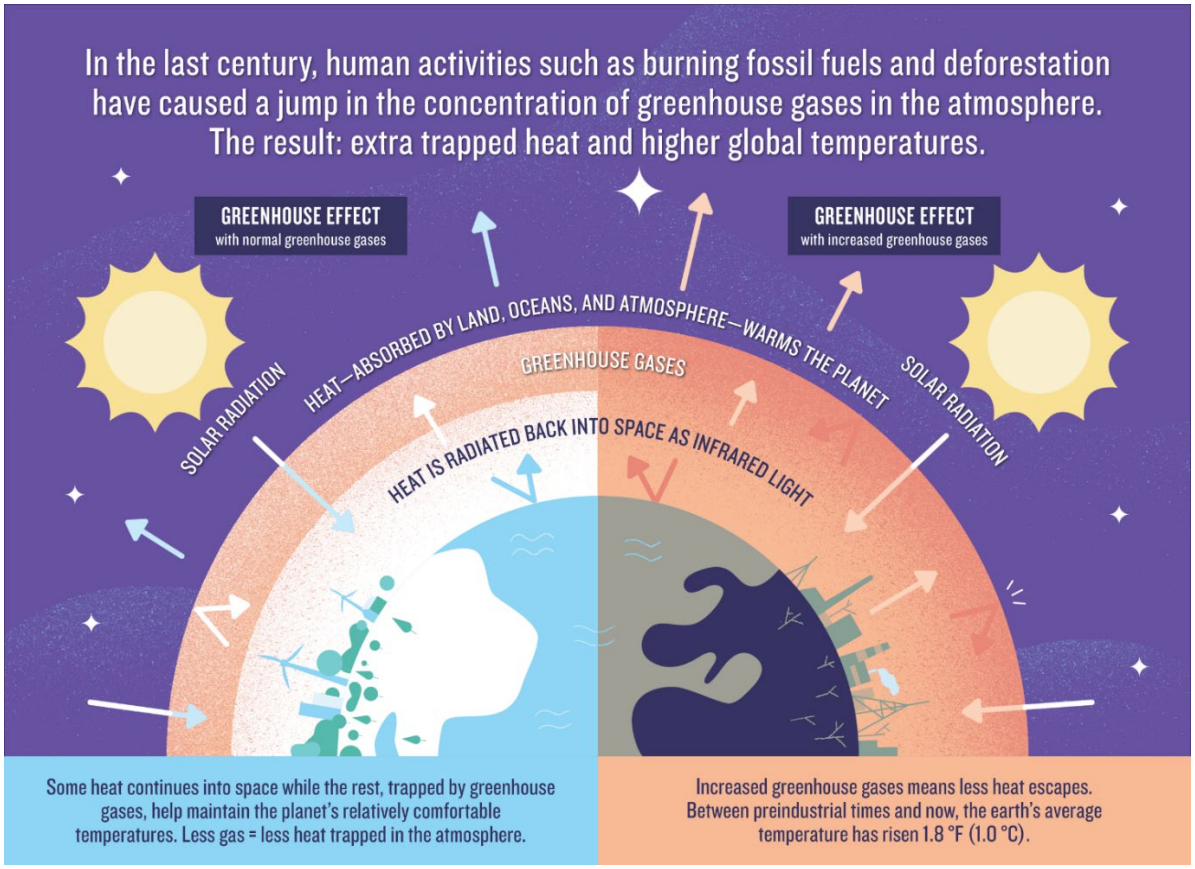
8 Ibid.

9 IPCC. "Impacts of 1.5°C of Global Warming on Natural and Human Systems," *Assessment Report 5*. 2018. Available: https://www.ipcc.ch/sr15/chapter/chapter-3/ Accessed December 2021.

10 NASA-GISS. "Land-Ocean Temperature Index (C): Global Mean Estimates Based on Land and Ocean Data". Available: https://data.giss.nasa.gov/gistemp/graphs/graph_data/Global_Mean_Estimates_based_on_Land_and_Ocean_Data/graph.txt. Accessed December 2021.

11 NASA. "Global Surface Temperature | NASA Global Climate Change," Climate Change: Vital Signs of the Planet. Available: https://climate.nasa.gov/vital-signs/global-temperature. Accessed December 2021;
Climatic Research Unit (CRU). "Land Surface Air Temperature Variations Across the Globe Updated to 2019: The CRUTEM5 Data Set," *Journal of Geophysical Research: Atmospheres* 126, no. 2. 2021. https://doi.org/10.1029/2019JD032352 Accessed: December 2021;

12 IPCC. "Summary for Policymakers — Global Warming of 1.5 °C". Available: https://www.ipcc.ch/sr15/chapter/spm/. Accessed December 2021.



Source: National Resources Defense Council, https://www.nrdc.org/stories/greenhouse-effect-101

Types of GHG Emissions

The IPCC lists the following GHGs: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), as well as chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are collectively called fluorinated gases.[13] Almost all the GHGs emitted in the United States each year consist of CO_2, CH_4, and N_2O,

[13] Note: Fluorinated gases, which includes four main types: hydrofluorocarbons 8. (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6) and nitrogen trifluoride (NF_3), are man-made gases that can stay in the atmosphere for centuries and contribute to the GHG effect. Center for Climate and Energy Solutions. "Main Greenhouse Gases". 2021. Available: https://www.c2es.org/content/main-greenhouse-gases/. Accessed December 2021

while fluorinated gases make up the remaining emissions[14]. Because CO_2, CH_4, and N_2O comprise a large majority of GHG emissions at the community level, these are the gases considered in this analysis.

Each GHG has a different propensity for trapping heat in the atmosphere, known as its global warming potential (GWP). GHGs also last for different periods of time in the atmosphere, ranging from a decade to several thousand years. Because all the GHGs have different characteristics, a standard unit is needed to compare the potential impact of different GHGs and allow them to be added up in an analysis. This is achieved by converting all GHGs into the standard unit known as a carbon dioxide equivalent (CO_2e), based on the amount of heat one metric ton (MT) of CO_2 traps in the atmosphere. GWP for each GHG was drawn from the IPCC fifth Assessment Report[15], which represents the best available scientific consensus and is consistent with the methodology outlined in the California Air Resources Board (CARB) Scoping Plan. Since CO_2 is used as the reference point for trapping heat, CO_2 has a GWP of 1. Methane has a GWP of 28, meaning that each metric ton (MT) of methane causes 28 times more warming than 1 MT of CO_2. Nitrous oxide has a GWP of 265, meaning 265 times the GWP of 1 MT of CO 2.[16]

Sources of GHG Emissions

The combustion of fossil fuels is the primary source of GHG emissions, decomposition of waste, and land use change are also major contributors. It can be helpful to understand how different sectors contribute to total emissions. The top sources of GHGs nationwide are transportation, energy production, industrial processes, commercial and residential uses, agriculture, and land use change.[17] Fluctuations in annual GHG emissions can be attributed to changes in the economy, the price of fuel, and land-use change. For example, nationwide GHG emissions decreased from 2018 to 2019 by 1.7 percent. This decrease in emissions was

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[14] Note: Ninety-seven percent of the annual GHG emissions consist of CO_2, CH_4, and N_2O and fluorinated gases make up the remaining three percent of GHG emissions. US EPA. "Inventory of U.S. Greenhouse Gas Emissions and Sinks". 2021. Available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed: December 2021; World Resources Institute. "4 Charts Explain Greenhouse Gas Emissions by Countries and Sectors". 2021. Available: https://www.wri.org/insights/4-charts-explain-greenhouse-gas-emissions-countries-and-sectors. Accessed December 2021.

[15] IPCC. *Climate Change 2014: Synthesis Report*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf. Accessed December 2021; and California Air Resources Board (CARB). "California's 2017 Climate Change Scoping Plan". Available: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf . Accessed February 2022.

[16] IPCC. *Climate Change 2014: Synthesis Report*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf. Accessed December 2021

[17] US EPA, "Sources of Greenhouse Gas Emissions," Overviews and Factsheets. 2020. Available: https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions. Accessed December 2021.

driven largely by the continued shift in electricity production as the electric power sector moves away from using coal to natural gas and renewables, as well as a small reduction in total energy consumption year over year.[18]

The main sources of GHG emissions in Cupertino are from buildings, transportation, waste, and water. Building emissions are associated with electricity and natural gas used by commercial, residential, and municipal buildings. Transportation emissions are generated by fuels used to power cars, trucks, and off-road vehicles. Waste from residential, commercial, and municipal sources generates methane emissions as material (especially organics like food scraps and yard waste) decomposes in the landfill. Water emissions are generated by the electricity used to transport water for residential, commercial, and agricultural use, and emissions from wastewater treatment processes.

Opportunities to Reduce GHG Emissions

Cities are important players in reducing GHG emissions at the local level. Local government policies and programs can affect high-emissions behaviors, help mitigate the impacts of climate change, and prepare the community for resilience. Ways those cities can influence climate action and emissions include strategic local land use planning, updating building standards, and public and private partnerships that encourage behavior change. Cities can take numerous actions to help reduce emissions such as improving building codes to reduce energy use, incentivizing alternative transportation options to decrease fuel use, expanding options for waste stream diversion and renewable energy sources, and educating community members about their choices as citizens and customers.

2.2 Climate Change Impacts in Cupertino

Climate change already has impacted and will continue to impact the City of Cupertino, its residents, businesses, and visitors. In the past few years, Cupertino has experienced severe droughts, poor air quality from regional wildfire smoke, and local flooding from extreme precipitation events. As the climate continues to change, many climate hazards may become more frequent and intense. The City has performed research and public outreach to identify which hazards are likely to impact Cupertino, the intensity of those impacts, and the City's capacity to adapt to these hazards. Together these metrics form a vulnerability assessment. A companion document to this CAP 2.0 outlines the detailed methodology that was used.

[18] US EPA. "Inventory of U.S. Greenhouse Gas Emissions and Sinks," Reports and Assessments. 2021. Available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks. Accessed: December 2021.

The City of Cupertino's vulnerability assessment is summarized in Table 2.

Table 2: Projections and Impacts by Climate Hazard

Climate Hazard	Projected Change	Major Impacts
Adverse air quality impacts	• Warmer temperatures will increase smog and pollutant formation • Wildfires will deteriorate air quality • Pollen and dust production will increase	• Health risks for vulnerable groups including children and people with pre-existing health conditions • Decreased outdoor recreational opportunities
Extreme heat	• Increase in extreme heat days from 5 per year to 11 per year by 2050 and up to 14 days per year by 2100 (RCP 4.5) • Maximum temperatures increase by 1.8°C (3.3°F) in 2050 and 2.3°C (4.2°F) by 2100	• Heat-related illnesses and exacerbation of pre-existing health conditions • Higher building operational costs and brownouts • Financial burden related to replacing food, running generators, etc. • Decreased productivity in work and school, stress to natural systems, and infrastructure deterioration
Extreme precipitation/storm flooding	• Extreme storm frequency remains similar in mid-century but annual average increases by 1-2 events by late-century • Precipitation events (measured in inches/day) could increase 6-21% (up to 37% under RCP 8.5) by 2100	• Residents in high-risk areas at risk for structural damage, injuries, and displacement • Disruptions to energy, transportation, and water infrastructure • Flood insurance premiums increase by $10 to $30 per month for certain residents

Climate Hazard	Projected Change	Major Impacts
Wildfire	• Longer wildfire season, more frequent wildfires, and greater intensity • Across the Bay Area, increase from 8,208 hectares burning annually to 9,969 by mid-century (RCP 4.5) • In Cupertino, wildfire risk remains similar at about 30-40 hectares burning annually	• Residents in high-risk areas: direct injuries, structural damage, and displacement • Wildfire smoke • Disruptions to natural systems • Public safety power shutoffs • Damage to regional energy, information and communications, and transportation infrastructure
Drought	• On average, 4.9 fewer inches of annual precipitation by late century under drought conditions • Decrease in Sierra Nevada snowpack 30-60% under RCP 8.5 due to higher rates of melting and less precipitation falling as snow	• Impacts on agriculture could increase food costs • Increase in utility bills • Concentration of contaminants in drinking water • Mosquito-borne disease and Valley Fever • In extreme cases, land subsidence
Sea level rise	• Around 0.74 m (about 2.43 feet) of sea level rise in the San Francisco Bay by 2100	• Disrupt regional energy, transportation, and water infrastructure • Impacts on neighboring cities could strain social services, housing, and other regional resources

Some Impacts are Being Felt Now, and Hazards are Projected to Intensify

Adverse Air Quality Impacts

Because of Cupertino's geography, weather, and local features such as Interstate 280, the city is already at high risk for poor air quality. From 2015 to 2019, Cupertino experienced 31 days where ozone or particulate matter levels exceeded state standards.[19] As the climate changes, warmer and drier temperatures will create more pollutants such as ozone, wildfire smoke, dust, and pollen. Poor air quality is linked to respiratory conditions such as asthma, vascular conditions such as heart attacks and stroke, and various cancers. Children and youth, seniors, those with pre-existing conditions, pregnant women, and outdoor workers are especially vulnerable and make up over 41% of Cupertino's population.

Extreme Heat

Hot days are familiar in Cupertino, but extreme heat days are projected to become more frequent, longer, and more severe. Extreme heat can cause illnesses such as heat exhaustion, exacerbate pre-existing conditions, and increase the risk of vascular events such as heart attacks, all of which can cause significant injury or even death. Children and youth, seniors, persons with health conditions, and low-income communities are more vulnerable to extreme heat. Extreme heat may also impact residents by causing brownouts, increasing costs through air conditioning and other protective measures, decreasing productivity, stressing natural systems, and damaging infrastructure.

Flooding from Severe Storms & River Flooding

Historically, some areas of Cupertino have experienced occasional shallow overland flooding[20], and the areas around Stevens Creek and Calabazas Creek are vulnerable to riverine flooding. Cupertino experienced its most recent severe flooding event in February 2017, after two large storm events occurred in the span of two weeks. As the climate changes, the average annual volume of precipitation is not expected to change dramatically, but storm events like the ones in 2017 are projected to become more frequent and intense. This means precipitation may be compressed into fewer, intense events rather than spread out in smaller precipitation events. About 300 people and 82 structures are at risk during a

[19] Based on San Jose monitoring station data. Bay Area Air Quality Management District. Air Quality Summary Reports. Available: https://www.baaqmd.gov/about-air-quality/air-quality-summaries. Accessed January 2022.

[20] FEMA. 2015. "Flood Insurance Study: Santa Clara County". Available: https://msc.fema.gov/portal/advanceSearch#searchresultsanchor . Accessed February 2022.

10-year flood.[21] Those at direct risk may experience property damage, injuries and other health impacts, and financial costs including higher flood insurance premiums. Indirect impacts may include disruptions to economic activity and infrastructure damage.

Wildfires and Smoke

In August of 2020, the CZU and SCU Lightning Complex fires collectively burned 483,133 acres, destroyed over 1,700 structures, and damaged over 150 more.[22] The SCU Lightning Complex fire alone was the fourth largest wildfire incident in California history. These fires severely degraded the area's air quality. During the fires, particulate readings regularly crossed into the "Unhealthy" level, and officials called on residents to stay indoors. When the CZU Lightning Complex fire spread rapidly through the mountains west of Cupertino, more than 22,000 people in the area were evacuated. Increased temperatures, drought, and severe weather can increase fire risk and contribute to similar incidents impacting Cupertino.

About 33 residents live in high-risk areas and may experience significant impacts such as direct injuries, structural damage, and displacement.[23] However, all Cupertino residents are exposed to indirect impacts like public safety power shutoffs, damage to regional infrastructure like major highways, and degraded natural areas. As stated in the air quality section, groups such as children and youth are highly vulnerable to poor air quality and make up a large part of Cupertino's population.

Drought

For Santa Clara County, 2021 had been the 33rd driest year over the past 127 years on record, and the entire county was designated as experiencing extreme or exceptional drought.[24] The ten reservoirs in the South Bay Area were collectively at less than 12 percent of total

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[21] Office of Emergency Services, County of Santa Clara, and Santa Clara County Fire. October 15, 2017. Santa Clara County Operational Area Hazard Mitigation Plan Volume 1—Operational-Area-Wide Elements. Available: https://emergencymanagement.sccgov.org/sites/g/files/exjcpb261/files/For%20Partners/Local-Hazard-Mitigation-Plan-LHMP-Vol-1.pdf. Accessed February 2022.

[22] CAL Fire. SCU Lightning Complex Incident Report. Available: https://www.fire.ca.gov/incidents/2020/8/18/scu-lightning-complex/#incident-damages-losses. Accessed January 2022.

[23] Office of Emergency Services, County of Santa Clara, and Santa Clara County Fire. October 15, 2017. Santa Clara County Operational Area Hazard Mitigation Plan Volume 1—Operational-Area-Wide Elements. Available: https://emergencymanagement.sccgov.org/sites/g/files/exjcpb261/files/For%20Partners/Local-Hazard-Mitigation-Plan-LHMP-Vol-1.pdf. Accessed February 2022.

[24] Drought.gov, NIDIS. "Santa Clara County Conditions". Available: https://www.drought.gov/states/california/county/santa%20clara. Accessed December 2021.

capacity as of September 2021.[25] Valley Water instituted a 15% water use reduction in June 2021, but the County remains in a drought emergency despite reaching monthly conservation goals.[26] As the climate becomes hotter and drier, drought conditions may worsen. This can increase food prices, utility bills, and other costs. As water becomes scarcer, water quality may decrease as algal blooms occur, pollutants become more concentrated, and stressed natural systems no longer filter water. Drawing up high levels of ground water may cause further contamination, and in extreme cases, cause the ground to subside.

Sea Level Rise

Cupertino will not be directly impacted by sea level rise, even when accounting for extreme conditions.[27,28] Rising sea levels may push groundwater closer to the surface, causing flooding from underneath. [29] However, current projections indicate that Cupertino will not be affected by such emergent groundwater.[30] Though Cupertino will not be directly affected by sea level rise, there may be significant regional impacts. These impacts have the potential to be both extensive and expensive and can affect public infrastructure, private property, vulnerable communities, natural resources, drinking and agricultural water supplies, toxic contamination, and economic disruption.[31]

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[25] Robert Handa, *NBC Bay Area.* "Here's How California's Drought Is Impacting Bay Area Reservoirs". 2021. Available: https://www.nbcbayarea.com/news/local/climate-in-crisis/heres-how-californias-drought-is-impacting-bay-area-reservoirs/2665032/. Accessed: December 2021.

[26] Santa Clara Valley Water. "Santa Clara County is in an extreme and exceptional drought and Valley Water can help you save water". 2021. Available: https://www.valleywater.org/drought. Accessed December 2021.

[27] Cal-Adapt. Sea Level Rise. Available: https://cal-adapt.org/tools/slr-calflod-3d/. Accessed December 2021.

[28] Manoochehr Shirzaei and Roland Burgmann. Science Advances. March 2018. Global climate change and local land subsidence exacerbate inundation risk to the San Francisco Bay Area. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5846283/. Accessed February 2022.

[29] Legislative Analysts Office, California. 2020. "What Threat Does Sea Level Rise Pose to California?". Available: https://lao.ca.gov/reports/2020/4261/sea-level-rise-081020.pdf . Accessed February 2022.

[30] Ellen Plane, Kristina Hill, and Christine May. Water. 2019. A Rapid Assessment Method to Identify Potential Groundwater Flooding Hotspots as Sea Levels Rise in Coastal Cities. Available: https://doi.org/10.3390/w11112228. Accessed February 2022.

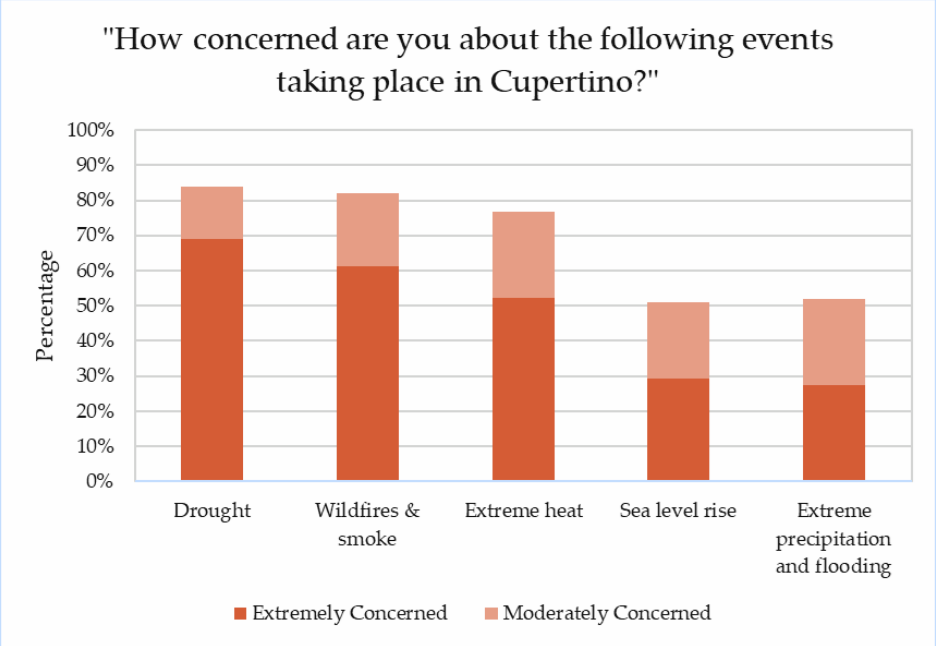
[31] Legislative Analysts Office, California. 2020. "What Threat Does Sea Level Rise Pose to California?". Available: https://lao.ca.gov/reports/2020/4261/sea-level-rise-081020.pdf . Accessed February 2022.

Adapting to Climate Change

Community Concerns

The public's strong concerns about climate hazards further emphasize the necessity of adapting to climate change. In the first Climate Action Plan 2.0 survey, conducted in summer 2021, 86% of respondents believe that climate change currently has at least some impact on them and their family's personal wellbeing and safety. 95% of respondents believe that climate change will have at least some impact on them and their family's personal wellbeing and safety 10 years from now. Common concerns expressed in public engagement included health risks related to extreme heat and poor air quality, improving air quality monitoring and alert systems, the effects of climate hazards on outdoor recreational and social opportunities, and the costs related to increased insurance premiums and loss of power. Figure 1 provides greater details about which hazards residents are most concerned about.

Figure 1. Community Concerns about Climate Hazards



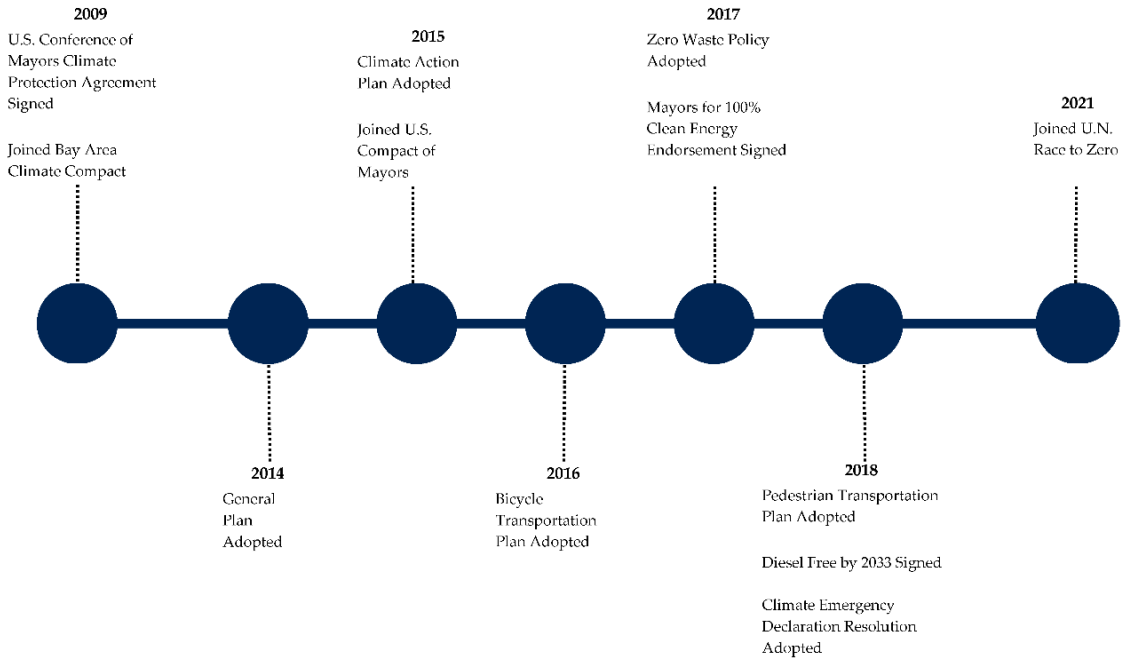
Source: Public Survey 1, out of 106 respondents

3 Climate Action History

3.1 Progress to Date

The City of Cupertino has conducted a GHG emissions inventory of communitywide GHG emissions for 2010, 2015, and 2018. In addition to these inventories, the City prepared a CAP in 2015 that assessed both communitywide and municipal GHG emissions. See **Appendix B** for more information about the data used and how GHG emissions were calculated for Cupertino's 2018 GHG emissions inventory. Figure 2 shows some of the major milestones from recent history in Cupertino's climate actions. Progress reports are available online at cupertino.org/sustainability.

Figure 2. Selected Milestones in Cupertino's Climate Action History



Trends from Cupertino GHG Emissions Inventories

In the 2015 CAP, the City of Cupertino set a target to reduce GHG emissions 15 percent compared to 2010 by the year 2020. The City achieved this target ahead of schedule with emissions falling 15 percent below 2010 levels as of 2018. Community emissions are driven by both residential and commercial activity occurring within Cupertino, and changes in population and jobs in the City can result in increases or decreases in community emissions. For example, Cupertino has experienced an estimated 6 percent increase in population, 18 percent increase in jobs, and a 10 percent increase in daytime or "service" population since 2010. As a result of increases in local jobs, commercial natural gas usage also increased since 2010, by roughly 18 percent. While the City's climate actions and other systemic changes resulted in an overall 15 percent decrease in emissions, reducing commercial natural gas usage represents an opportunity for continued progress. For a full account of the progress that Cupertino has already achieved since the 2015 CAP, as well as complimentary sustainability projects and programs pursued by the City of Cupertino above and beyond the CAP measures, please refer to **Appendix E: Existing Programs and Accomplishments**.

Robust Sustainability Leadership

The City of Cupertino and the Cupertino City Council have a robust legacy as a leader in sustainability. This is achieved through the City's dedicated Cupertino Green team to implement sustainability leadership and to support continued innovation and effective action on climate and sustainability. Cupertino Green is dedicated to designing and coordinating the energy, water, and transportation goals set forth in the City's General Plan – Sustainability Element. Cupertino Green is made up of both the Sustainability and Environmental Programs teams and is committed to maintaining Cupertino as a sustainable and healthy place to live, learn, work, and play for all members of the Cupertino community.

Sustainability Team

Housed within the City Manager's Office, the Sustainability team oversees Cupertino's Climate Action Plan as well as providing residents, businesses, and schools with programs and services. This team focuses primarily on energy efficiency, renewable energy, water conservation, drought resources, alternative transportation, the annual Earth Day Festival, and other sustainable actions.

Environmental Programs Team

Housed within the Public Works Department, the Environmental Programs team manages the City's waste disposal services and provides composting and recycling programs to Cupertino residents and businesses. This team also ensures that state and federal requirements for storm runoff management are met to protect to local creeks and the San Francisco Bay from pollutants carried in runoff after storms.

Sustainability Commission

The Cupertino Sustainability Commission consists of five members appointed by the City Council to provide expertise and guidance on policy areas related to the City's ongoing climate action planning efforts. The Sustainability Commission serves in an advisory capacity to the City Council and provides expertise and guidance on major policy and programmatic areas related to the environmental, economic, and societal goals noted within the Cupertino CAP and General Plan (GP) Environmental Resources/Sustainability Element.

Lessons Learned

The measures and actions in this CAP 2.0 provide Cupertino with the per capita GHG reductions necessary to achieve Cupertino's 2030 climate action target (See Section 5.3 and Chapters 8-11). However, the City's ambitious target of carbon neutrality by 2040 requires some difficult to achieve reductions in emissions that depend on significant changes to the technology and systems currently in place.[32]

As these measures and actions are implemented, the City will gain more information, new technologies will emerge, and current pilot projects and programs will scale to the size needed to reach carbon neutrality. Furthermore, the state is expected to update state-level regulations and provide additional support for meeting carbon neutrality in the future. The City has additionally identified a future CAP update schedule, as described in Section 13, *Future CAP updates past 2030,* and will outline new measures and actions that Cupertino will implement to close the remaining gap to achieve the target of carbon neutrality by 2040.

[32] Association of Environmental Professionals (AEP). "The California Supplement to the United States Communitywide Greenhouse Gas (GHG) Protocol". 2013. Available: https://califaep.org/docs/California_Supplement_to_the_National_Protocol.pdf . Accessed February 2022; and California Air Resources Board (CARB). "California's 2017 Climate Change Scoping Plan". Available: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf . Accessed February 2022.

4 Current and Projected GHG Emissions

4.1 Cupertino GHG Emissions Inventory

Community GHG inventories measure the GHG emissions generated by residents and businesses operating in the community, as well as municipal operations. The process of creating a GHG inventory includes first identifying activities that are major sources of emissions and collecting summary data on those activities for a calendar year. Then, the City uses science-based GHG emissions factors to convert the collected data into an accounting of GHG emissions produced through all the identified activities. Inventories measure GHG emissions in units of metric tons of carbon dioxide equivalent, or MT CO_2e.

GHG Inventory Protocols

There are various inventory protocols to guide communities in accurately and consistently measuring GHG emissions. Consistent with the California Office of Planning and Research's (OPR) guidance, Cupertino's inventory methods rely on the U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions (Version 1.2) and are consistent with the methodologies used by other cities throughout the State of California.

The Community Protocol is the authoritative guide for best practices in calculating community-scale GHG inventories. The protocol separates a city's GHG-generating activities into categories known as emissions sectors. Large emissions sectors for cities include the transportation sector (such as combustion emissions from cars and other vehicles operating within the city), the building sector (including emissions from electricity and natural gas usage), and the waste sector (capturing emissions from sending solid waste to the landfill). Consistent with the State's GHG inventory, the global warming potential (GWP) values for methane (CH_4) and nitrous oxide (N_2O) were derived from the IPCC Assessment Report 5.[33]

Not all activities within a city that generate GHGs are included in a GHG emissions inventory. Activities that cannot be controlled or influenced by city policies are generally excluded as they have little bearing on city planning. For example, emissions from cars traveling through a city, whose origins and destinations are both outside of city limits, are typically excluded because a local government cannot reasonably influence this pass-through travel activity.

33 IPCC. *Climate Change 2014: Synthesis Report*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf. Accessed December 2021.

Current Inventory

The CAP 2.0 includes a 2018 inventory of GHG emissions from Cupertino communitywide activities. The inventory includes sources within each sector that are within some degree of jurisdictional control by the City, in accordance with established GHG accounting protocols and State guidance. In 2018, Cupertino's GHG emissions totaled 346,998 MT CO2e. This represents a 15 percent decrease in emissions compared to 2010 emissions levels (408,176 MT CO2e) and a 14 percent reduction in emissions relative to 1990 emissions levels (402,639 MT CO2e).

As shown in Figure 3 and Table 2, emissions from transportation made up the largest sector contribution to total emissions (220,625 MT CO2e, or 65 percent of total emissions). The second largest source of emissions (91,029 MT CO2e, or 26 percent of total emissions) was building energy use from electricity and natural gas consumption. Energy emissions were split evenly between the residential sector and the commercial/industrial sector. The remaining community emissions were from wastewater management (19,635 MT CO2e, 6 percent of emissions) and solid waste (15,709 MT CO2e, 5 percent of emissions), including the decomposition of solid wastes in the landfill.

Figure 3. Cupertino Greenhouse Gas Emissions by Sector, 2018

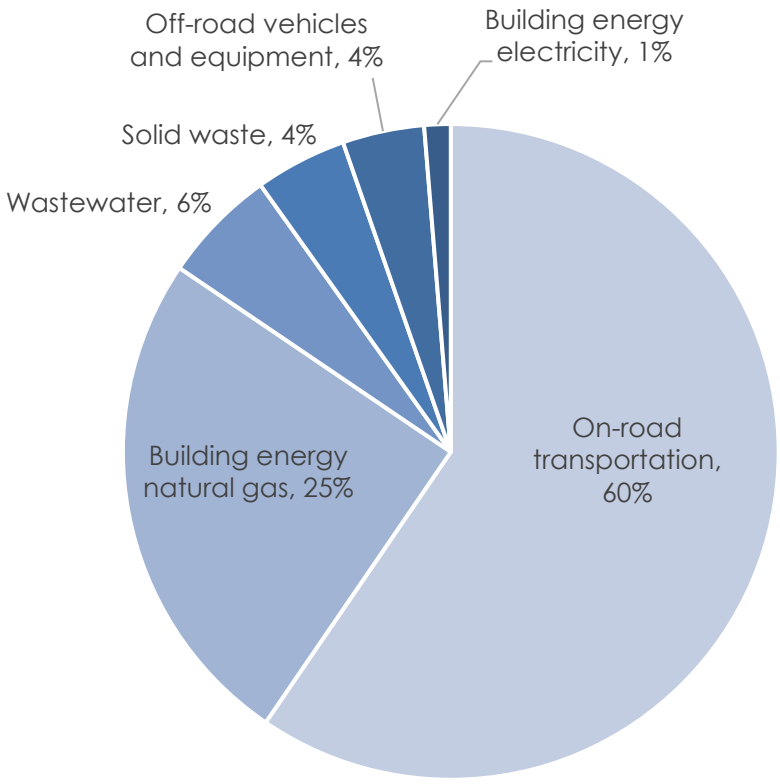


Table 2 Cupertino 2018 GHG Emissions Inventory Summary

GHG Emissions Sector/Source	CO_2 (MT)	CH_4 (MT)	N_2O (MT)	CO_2e (MT)	% of Total Emissions
Transportation					**65%**
Passenger On-Road Transportation	130,864	8.2	5.8	132,635	38%
Commercial On-Road Transportation	71,440	3.8	9.2	73,972	21%
Passenger On-Road - EV adjustment	27	0.0	0.0	27	<1%
Commercial On-Road - EV adjustment	0	0.0	0.0	0	<1%
Off Road - Diesel	6,352	0.2	0.3	6,432	2%
Off Road - Gasoline	4,507	4.5	0.1	4,651	1%
Off Road - Natural Gas (LPG)	2,841	0.5	0.2	2,908	1%
Residential					**13%**
Residential Electricity - PG&E	253	0.04	0.00	256	<1%
Residential Electricity - SVCE	186	0.00	0.00	186	<1%
Residential Electricity - Direct Access	5	0.00	0.00	5	<1%
Residential Natural Gas	43,428	N/A	N/A	43,428	13%
Natural Gas Fugitive - Residential	1	50.7	N/A	1,420	<1%
Commercial/Industrial					**13%**
Commercial/Industrial Electricity –PG&E	0	0.0	0.0	287	<1%
Commercial/Industrial Electricity – SVCE	215	0.0	0.0	215	<1%
Commercial/Industrial Electricity – Direct Access (Other)	3,544	0.4	0.0	3,564	1%
Commercial/Industrial Electricity – EV adjustment	0	0.0	0.0	0	0%
Commercial/Industrial Natural Gas – PG&E	39,957	N/A	N/A	39,957	12%
Natural Gas Fugitive - Commercial	0.7	61.05	N/A	1,710	<1%
Wastewater					**6%**
Wastewater Treatment and Discharge	N/A	695.0	0.7	19,635	6%
Solid Waste					**5%**
Solid Waste Generated/Disposal	N/A	561.1	N/A	15,709	5%

N/A = not applicable; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent; PG&E = Pacific Gas and Electric; SVCE = Silicon Valley Clean Energy; kWh = kilowatt-hour; EV = electric vehicle

Refer to **Appendix B** for a more detailed discussion related to methodology, modeling, and supporting evidence for the Cupertino 2018 GHG inventory.

4.2 Cupertino GHG Emissions Forecasts

GHG forecasts provide an estimate of Cupertino's GHG emissions in the future, based primarily on projected population and job growth in the City. Forecasting helps to track trends and progress for the City and allows the City to see how much it needs to reduce emissions in order to meet its future GHG emissions reduction targets. GHG emissions forecasts for Cupertino were developed using the 2018 inventory for 2023, 2026, 2030, 2035, 2040 and 2045.

The City developed two forecasts to contextualize how emissions will change and better understand the reduction actions that Cupertino must take. The first forecast is a business-as-usual (BAU) forecast, and the second is an adjusted forecast that accounts for GHG reduction policies and programs.

Business as Usual Forecast

The BAU forecast assumes that per capita emissions remain constant. Under this assumption, population and job growth are the main drivers for GHG generating activities. The BAU forecast provides a basis of comparison by assuming there are no changes to technology, behaviors, or legislation, and population and job growth trends continue as projected. However, several state regulations (e.g., SB 1, SB 100, AB 1493) have been enacted that will reduce future local emissions. This means that another forecast that incorporates these effects into emissions projections is also needed.

Data and Methods

The BAU GHG emissions projections were calculated based on guidance from the Association of Environmental Professionals 2012 whitepaper Forecasting Communitywide GHG Emissions and Setting Reduction Targets. To develop a GHG emissions forecast, "growth metrics" (e.g., population, housing, and employment projections) are multiplied by BAU "growth indicators," which represent a baseline metric developed from the GHG emissions inventory. This process allows the City to convert growth projections into GHG emissions estimates using specific GHG emissions factors, which is assumed to be the same in the future as in the 2018 GHG emissions inventory. The result is a BAU forecast in which GHG emissions change in relation to demographics, with the assumption that GHG emissions rates and activity data will continue in the future as they did in the year of the 2018 GHG emissions inventory. This methodology is used for all GHG emissions sectors and sources included in the 2018 GHG emissions inventory, apart from the off-road emissions sector. To forecast off-road emissions, the OFFROAD2021 off-road emissions database was used to project fuel use since no significant GHG emission reduction legislation is included in the model. Table 3 summarizes the BAU forecast for each forecast year.

Table 3 BAU Emissions Forecast (MT CO_2e)

GHG Emissions Source	2023	2026	2030	2035	2040	2045
Transportation	**231,509**	**235,735**	**240,232**	**246,486**	**252,825**	**258,821**
Passenger On-Road Transportation	136,582	138,100	140,150	144,696	149,390	154,235
Commercial On-Road Transportation	78,238	79,607	80,687	81,545	82,842	84,176
Residential Electricity - EV Adjust	27	27	27	33	34	34
Commercial/Industrial Electricity - EV Adj	0	0	0	0	0	0
Off Road – Diesel	7,725	8,630	9,631	10,138	10,372	10,588
Off Road – Gasoline	5,503	5,763	5,965	6,133	6,171	5,963
Off Road - Natural Gas (LPG)	3,434	3,608	3,770	3,941	4,017	3,826
Residential	**45,597**	**45,813**	**45,869**	**55,459**	**56,462**	**57,482**
Residential Electricity - PG&E	258	259	259	313	319	325
Residential Electricity – SVCE	187	188	188	228	232	236
Residential Electricity - Direct Access	5	6	6	7	7	7
Residential Natural Gas - PG&E	43,717	43,924	43,978	53,173	54,134	55,112
Natural Gas Fugitive – Residential	1,430	1,437	1,438	1,739	1,770	1,802
Commercial/Industrial	**52,115**	**53,655**	**54,538**	**54,860**	**54,753**	**54,646**
Commercial/Industrial Electricity - PG&E	327	337	342	344	344	343
Commercial/Industrial Electricity – SVCE	245	252	257	258	258	257
Commercial/Industrial Electricity – DAO	4,066	4,187	4,256	4,282	4,273	4,265
Commercial/Industrial Electricity – DAA	0	0	0	0	0	0
Commercial/Industrial Natural Gas - PG&E	45,583	46,940	47,719	48,003	47,908	47,814
Natural Gas Fugitive – Commercial	1,894	1,938	1,964	1,973	1,970	1,967
Wastewater	**20,767**	**21,130**	**21,417**	**21,645**	**21,989**	**22,343**
Wastewater Treatment and Discharge	20,767	21,130	21,417	21,645	21,989	22,343
Solid Waste	**16,615**	**16,906**	**17,136**	**17,318**	**17,593**	**17,876**
Community Generated Solid Waste	16,615	16,906	17,136	17,318	17,593	17,876
TOTAL	**366,604**	**373,239**	**379,192**	**395,768**	**403,622**	**411,169**

Notes: Values in this table may not add up to totals due to rounding

All values are of the unit metric tons of carbon dioxide equivalent (MT CO_2e)

PG&E = Pacific Gas and Electric; SVCE = Silicon Valley Clean Energy; DAO = Direct Access Other; DAA = Direct Access Apple; kWh = kilowatt-hour.

Adjusted Forecast

The adjusted forecast adjusts the BAU forecast to account for state-level legislation, policies, and programs that are expected to reduce GHG emissions in California. Because it includes the effects of adopted legislation, the adjusted forecast is considered a more realistic picture of Cupertino's future emissions. Comparing the BAU and adjusted forecasts can illustrate the scale of GHG emissions reductions in Cupertino that are likely to result from state-level policies and programs.

State-Level Policies Included in the Adjusted Forecast

There are several state-level regulations and policies that have been enacted and are expected to reduce Cupertino's future emissions. These pieces of legislation are incorporated into the adjusted forecast to provide a more accurate depiction of Cupertino's future emissions. The relevant policies and programs are as follows:

Advanced Clean Cars Program: A comprehensive car emissions control program which regulates smog, soot-causing pollutants, and GHG emissions into a single coordinated package of requirements.

Title 24 Building Energy Efficiency Standards: Building standards that regulate new residential and commercial development in California by requiring increased efficiency related to space heating and cooling, lighting, and water heating.

California Renewable Portfolio Standard (RPS): Requires investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from renewable energy resources.

See **Appendix A** for more information on these and a suite of other programs and policies that are intended to reduce emissions, including SB 1383 and AB 341.

Table 4 Adjusted Forecast (MT CO_2e)

GHG Emissions Source	2023	2026	2030	2035	2040	2045
Transportation	**213,921**	**205,470**	**194,328**	**182,901**	**177,328**	**175,971**
Passenger On-Road Transportation	123,196	117,032	110,724	108,381	108,764	110,886
Commercial On-Road Transportation	74,016	70,368	64,102	54,122	47,877	44,709
Residential Electricity - EV Adjust	44	50	52	38	20	0
Commercial/Industrial Electricity - EV Adj	3	20	84	148	107	0
Off Road - Diesel	7,725	8,630	9,631	10,138	10,372	10,588
Off Road - Gasoline	5,503	5,763	5,965	6,133	6,171	5,963
Off Road - Natural Gas (LPG)	3,434	3,608	3,770	3,941	4,017	3,826
Residential	**45,527**	**45,724**	**45,757**	**54,499**	**55,975**	**56,844**
Residential Electricity - PG&E	218	198	170	124	69	0
Residential Electricity - SVCE	179	177	172	126	70	0
Residential Electricity - Direct Access	4	4	3	2	1	0

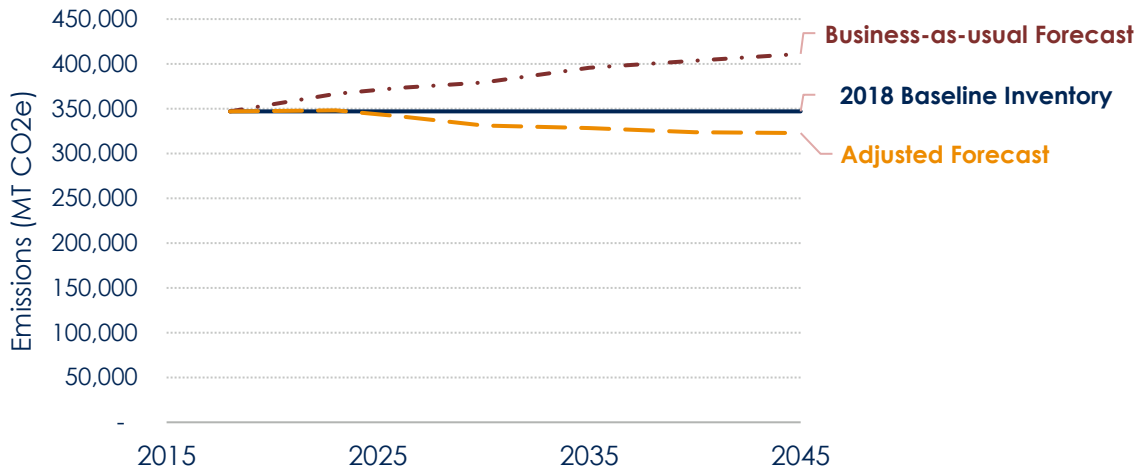
GHG Emissions Source	2023	2026	2030	2035	2040	2045
Residential Natural Gas - PG&E	43,697	43,909	43,974	52,529	54,066	55,044
Natural Gas Fugitive - Residential	1,429	1,436	1,438	1,718	1,768	1,800
Commercial/Industrial	**51,305**	**52,365**	**52,609**	**51,939**	**50,858**	**49,781**
Commercial/Industrial Electricity - PG&E	277	258	224	151	75	0
Commercial/Industrial Electricity - SVCE	236	237	234	157	78	0
Commercial/Industrial Electricity - DAO	3,314	2,990	2,468	1,655	826	0
Commercial/Industrial Electricity - DAA	0	0	0	0	0	0
Non-Residential Natural Gas - PG&E	45,583	46,940	47,719	48,003	47,908	47,814
Non-Residential Biofuel – Apple Park	0	0	0	0	0	0
Natural Gas Fugitive - Commercial	1,894	1,938	1,964	1,973	1,970	1,967
Wastewater	**20,767**	**21,130**	**21,417**	**21,645**	**21,989**	**22,343**
Wastewater Treatment and Discharge	20,767	21,130	21,417	21,645	21,989	22,343
Solid Waste	**16,615**	**16,906**	**17,136**	**17,318**	**17,593**	**17,876**
Community Generated Solid Waste	16,615	16,906	17,136	17,318	17,593	17,876
TOTAL	**348,136**	**341,595**	**331,247**	**328,301**	**323,743**	**322,815**

Notes: Values in this table may not add up to totals due to rounding

All values are of the unit metric tons of carbon dioxide equivalent (MT CO_2e)

PG&E = Pacific Gas and Electric; SVCE = Silicon Valley Clean Energy; DAO = Direct Access Other; DAA = Direct Access Apple; kWh = kilowatt-hour.

Figure 4. Baseline Emissions Compared to Forecast Scenarios



Comparing Forecast Scenarios

The BAU forecast for Cupertino projects an increase in GHG emissions above the 2018 GHG emissions inventory from all GHG emissions sources through 2045 based on projected job and population growth in the city. Cupertino's BAU GHG emissions are projected to increase to 366,604 MT CO2e in 2023, 373,239 MT CO2e in 2026, 379,192 MT CO2e in 2030, and 403,622 MT CO2e in 2040 (see Figure 4 and Table 4).

The adjusted forecast projects that state legislation will result in GHG emissions reduction from the BAU forecast in both the residential and commercial/industrial sectors. Title 24 is expected to reduce GHG emissions due to reduced electricity and natural gas consumption in new residential housing units. Reduced GHG emissions associated with electricity generation due to the California RPS is expected to further reduce GHG emissions in the residential and the commercial/industrial sector. Cupertino's adjusted GHG emissions are projected to be 348,136 MT CO2e in 2023, 341,595 MT CO2e in 2026, 331,247 MT CO2e in 2030, and 323,743 MT CO2e in 2040 (see Figure 2 and Table 4).

Refer to **Appendix B** for a more detailed discussion related to methodology modeling, and supportive evidence for Cupertino's GHG forecasts.

5 Fair Share of GHG Emissions Reductions

5.1 International Context

Climate action at the local level is informed by science and policy targets at the international level. Bodies such as the United Nations Intergovernmental Panel on Climate Change (IPCC) perform scientific review and create policy recommendations. International treaties such as the Paris Agreement (2016) are legally binding treaties which cover nearly every nation on earth. The goal of carbon neutrality by 2040 is consistent with IPCC findings and research-based targets for avoiding the most serious climate change impacts. The Paris Agreement's central aim is to limit global temperature rise to 1.5 degrees Celsius above pre-industrial levels. The IPCC has found that to limit global warming to 1.5 degrees Celsius above pre-industrial levels and reduce the likelihood of catastrophic global climate change, the world must reach carbon neutrality by mid-century (~2050) and stabilize atmospheric concentrations at 350 parts per million (or less).

The State of California also aligns state-wide targets with these international frameworks. According to the California Air Resources Board (CARB), reducing the State's emissions to 80 percent below 1990 levels by 2050 would be consistent with the IPCC's analysis of the global emissions trajectory needed to achieve these goals.[34] The Paris Agreement establishes a global goal of enhancing adaptive capacity and requires all parties to determine national

[34] CARB. 2014. "First Update to the Climate Change Scoping Plan". Available: https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2013-scoping-plan-documents . Accessed February 2022.

contributions to the collective climate effort, and to regularly report emissions and progress on implementation efforts. These efforts are mirrored through Cupertino's work to increase resilience, achieve carbon neutrality, regularly inventory emissions, report progress towards targets, and ultimately to contribute a fair share towards limiting global temperature rise. **Cupertino targets associated with the CAP 2.0 are consistent with both the state and IPCC science-based targets related to GHG emissions reduction.** See Section 5.3 for Cupertino targets.

Cupertino is a city with global connections and a richly diverse population. More than 40 percent of residents were born outside of the United States, and many are first-generation Americans. This diversity fuels the creativity, innovation, and success of Cupertino. The global influence of the community goes both ways, with many of the products designed in Cupertino businesses being distributed around the world. To further celebrate and develop the international nature of the community, Cupertino partners with communities in other countries through Sister City and Friendship City relationships.

Cupertino has four established Sister City relationships:

- Copertino, Italy, formalized in 1963
- Toyokawa, Japan, formalized in 1978
- Hsinchu, Taiwan, formalized in 2007
- Bhubaneswar, India, formalized in 2012

5.2 State Context and Timeline/Emissions Targets

Over the last ten years California has adopted extensive legislation, policies, and programs to reduce GHG emissions across California, establishing itself as a global leader in climate change action. The primary legislation enumerating the state's climate goals and driving climate action at the state level are Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Order (EO) B-55-18. Together these regulations set statewide GHG reduction targets for 2020, 2030, and 2045 and chart a path towards a carbon neutral California, as explained below. See **Appendix A** for a full list of relevant state-level legislation.

Assembly Bill 32: Codified the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines the main strategies the state will employ to meet the 2020 target.

Senate Bill 32: This successor legislation to AB 32 requires California to achieve a statewide reduction in GHG emissions of 40 percent below 1990 levels by 2030. The SB 32 Scoping Plan was adopted in 2017.

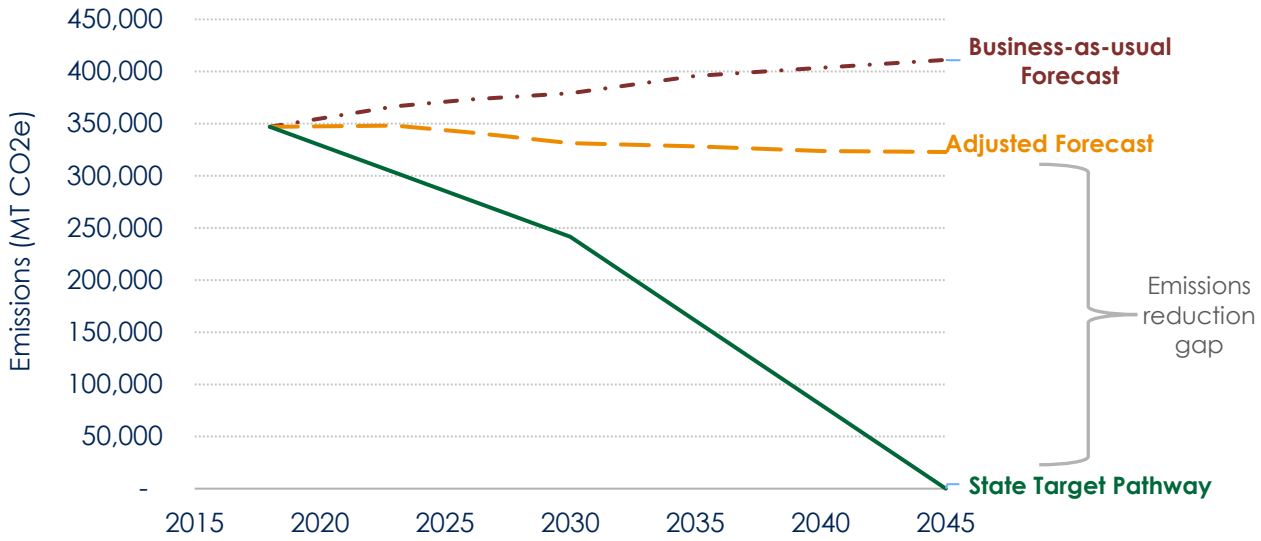
Executive Order B-55-18: Established a new statewide goal of achieving and maintaining carbon neutrality as soon as possible, and no later than 2045. Executive orders have not been codified by the state but are binding for state agencies.

5.3 Cupertino Context and Timeline/Emissions Targets

Emissions Gap Analysis to Set Targets

The difference between Cupertino's climate action targets and the adjusted forecast for emissions can be thought of as an "emissions reduction gap," or the amount of emissions reduction that the City and wider Cupertino community must achieve. After analyzing Cupertino's baseline inventory and forecast scenarios, emission targets were set to create quantitative milestones for the community's path to carbon neutrality and measure Cupertino's progress.

Figure 5. Emissions Reduction Gap Between Forecasted Emissions and State Targets



Cupertino GHG Emissions Targets

CARB's 2017 Scoping Plan recommends that local agencies establish communitywide GHG reduction goals for local climate action plans that will help California achieve its 2030 target and longer-term goal. The scoping plan notes that it is appropriate to derive evidence-based targets or goals from local emissions sectors and population projections if this process is consistent with the framework used to develop the Statewide targets. CARB also notes that GHG goals and targets should show a downward trend consistent with the statewide objectives.[35] The GHG emissions reductions associated with the measures in the CAP 2.0 are sufficient to exceed the state-level target established by Senate Bill (SB) 32 and meet the City's 2030 climate action target. The CAP 2.0 also makes substantial progress towards the

35 California Air Resources Board (CARB). "California's 2017 Climate Change Scoping Plan". Available: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf . Accessed February 2022.

City's 2040 target, which exceeds the state-level target established by executive order (EO) B-55-18.

The Cupertino climate action targets are more aggressive than the state-level goals to reduce GHG emissions 40 percent below 1990 levels by 2030 (in compliance with SB 32) and to carbon neutrality by 2045 (in compliance with EO B-55-18). Cupertino's climate action targets are to:

- Reduce the community's per capita GHG emissions to 3.39 MT CO_2e per person by 2030, which equals a 50 percent reduction from 2010 per capita levels, or a 66 percent reduction from 1990 per capita levels by 2030.[36]
- Based on projected population growth through 2030, this is equivalent to reducing the community's mass emissions to 222,867 MT CO_2e by 2030, or 45 percent below the community's 1990 GHG emissions.
- Achieve net-zero MT CO_2e per person, or carbon neutrality, by 2040. Maintain carbon neutrality through 2045 and beyond.

The City uses per capita emission targets to align with guidance from CARB's 2017 Scoping Plan Update. Making substantial progress toward California's 2030 and longer-term 2045 goals is important, as these targets have been set at levels that achieve California's fair share of international emissions reductions. Established by the Paris Agreement and the International Panel on Climate Change (IPCC), California's fair share of international emissions reductions are consistent with an emissions level expected to stabilize global climate change effects and avoid the worst environmental consequences.

Cupertino's emissions targets are further summarized and compared to the BAU and adjusted emissions forecasts in the tables below, beginning from the 2018 baseline year through 2045. The emissions "gap," the difference between the adjusted emissions forecast and Cupertino's GHG emissions targets, is shown for each year in the final row of both Table 5 and Table 6.

Table 5 Mass-based GHG Reduction Target Pathway (MT CO_2e)

GHG Emissions Pathways	2018	2023	2026	2030	2035	2040	2045
BAU Forecast	346,998	366,604	373,239	379,192	395,768	403,622	411,169
Adjusted Forecast	346,998	348,136	341,595	331,247	328,301	323,743	322,815
Cupertino Emissions Targets	346,998	295,543	265,064	222,867	112,918	0	0
Emissions "Gap"	0	52,593	76,530	108,380	215,384	323,743	322,815

36 This is equivalent to the City Council recommended target of 54% below 2010 levels by 2030.

Table 6 Per Capita GHG Reduction Target Pathway (MT CO_2e/person)

GHG Emissions Pathways	2018	2023	2026	2030	2035	2040	2045
BAU Forecast	5.46	5.71	5.75	5.77	5.95	5.91	5.87
Adjusted Forecast	5.46	5.42	5.26	5.04	4.93	4.74	4.61
Cupertino Emissions Targets	5.46	4.60	4.08	3.39	1.70	0.00	0.00
Emissions "Gap"	0.00	0.82	1.18	1.65	3.24	4.74	4.61

Meeting the GHG Emissions Targets

Though there will be some emissions reductions from state regulations, Cupertino must implement local GHG reduction measures to meet the 2030 emissions targets and make substantial progress towards the 2040 emissions targets. Cupertino would be required to reduce 108,380 MT CO2e by 2030, and 323,743 MT CO2e by 2040 to meet the chosen targets that exceed state goals. Table 6 also shows the remaining per capita reductions needed to meet the GHG emissions goals in MT CO_2e per person.

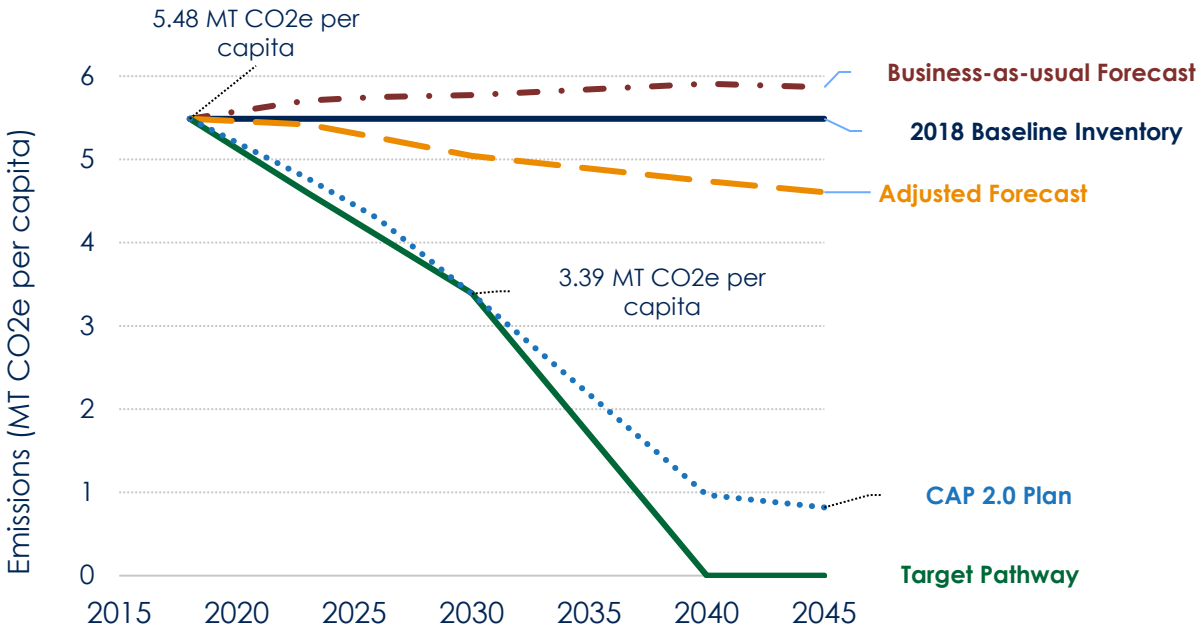
Targeted emissions reductions will be accomplished through local policies and programs developed from best practices of similar and neighboring jurisdictions. These activities are referred to as "measures" and "actions" and they should be clear, attainable, measurable, equitable, and cost-effective to help achieve the desired emission reductions.

Additional discussion and details are provided regarding measures and actions in Chapters 7 through 12. Table 7 shows the Cupertino climate action target emissions and the emissions reductions expected from implementing the measures and actions described in subsequent chapters. The table also shows that Cupertino will meet the 2030 GHG reduction target and make substantial progress towards the 2040 goal of carbon neutrality. Figure 6 shows how Cupertino measures would result in GHG reductions in line with the Cupertino targets.

Table 7 Targets Versus GHG Reductions

Target/Forecast	2030 GHG Emissions (MT CO_2e/person)	2040 GHG Emissions (MT CO_2e/person)
Business-as-usual Forecast	5.77	5.91
Adjusted Forecast	5.04	4.74
Cupertino Climate Action Targets	3.39	0.00
GHG Reductions from Full Implementation of CAP Update Measures	1.66	3.77
GHG Emissions after Measure Reductions (Adjusted Forecast – GHG Emissions Reductions)	3.39	0.97
Target Anticipated to be Met?	Yes	No; however, substantial progress demonstrated

Figure 6. Baseline Emissions per Capita Compared to Forecast Scenarios and Target Pathway to Carbon Neutrality



6 Community Voices

6.1 One Climate

We only have one planet, and one climate, that we all share. The impacts of climate change are already being felt across California, and as discussed in the climate science section of this report, the actions that communities take now can make a difference in the stability and functioning of our one climate and it's impacts on human wellbeing. To have a positive impact, communities must step up to take actions that reduce GHG emissions now and into the future. It is important for the community of Cupertino to do its fair share in this effort. This requires the community to work together to undertake the activities and projects that will reduce the community's contribution to climate change and that can help lead the way for other communities by demonstrating effective leadership, innovative thinking, and a commitment to addressing the climate crisis now. This effort will require wide participation, and will benefit from diverse perspectives, expertise, and experiences.

As directed by the City Council in a vision-setting study session (December 2020), the CAP 2.0 project team made extensive efforts to communicate with and obtain input from a range of community members. This approach to the CAP 2.0, the City's engagement efforts, and contributions from community groups and stakeholders are detailed in the following sections.

As part of this CAP Update process, the City utilized a multi-pronged approach engagement strategy to engage with Cupertino residents, businesses, organizations, and stakeholders. Key engagement objectives include:

Gather community perspectives and feedback that are representative of the diverse communities of Cupertino to inform CAP development and guide decision-making.

Create a framework for community action that clearly outlines how Cupertino residents and businesses can achieve CAP goals and take ownership in action implementation.

Educate, empower, and energize the Cupertino community to cultivate a shared understanding around climate change and inspire action.

Strengthen community relationships with the City to facilitate and coordinate CAP implementation and other priorities and activities.

As defined for the purpose of this CAP Update, equity consists of the effort to create equitable economic and physical access to municipal services and public amenities, promote economic prosperity for all the City's residents, protect the most vulnerable against the impacts of climate change, and improve the quality of life for all members of the community by fostering an inclusive and collaborative civic process.

To do this, the City employed multiple engagement approaches, including:

- Public workshops
- Stakeholder meetings
- Climate Action Plan Update Subcommittee meetings
- Surveys
- Pop-up events


OUR PLANET
OUR FUTURE
WIN SWAG
DICE FEST
MARVEL

How Equity was Centered in Cupertino's CAP Update Engagement Strategy

Equity and inclusion were central to the engagement strategy for this CAP Update. The City recognizes that some community groups – such as low-income households, people who speak limited English, elders, historically underserved communities, and people with functional access needs – may experience disproportionate burden from climate change impacts, and also may have fewer resources and ability to adapt to changes. The project team was mindful of these parts of the community as the CAP 2.0 was under development. The project team used the following approaches to ensure that public engagement was inclusive and equitable:

- **Translation of materials and public surveys** for Chinese-speakers in Cupertino.
- **Stakeholder meetings to hear from certain groups**, such as low-income households.
- **Stipends for community participants**, if requested, to compensate people for their time and contributions.

City Council Study Session, December 2020

Activate and celebrate the multiracial character of Cupertino. Take every effort to include traditionally under-represented voices and those who might be displaced by climate hazards in the planning and selection of strategies, as well as business, faith groups, neighborhoods, and schools. Create a plan that reflects the diversity of the city and sets us on a path towards a more welcoming and inclusive Cupertino.

6.2 Engagement Events & Feedback Summary

Table 8 below shows the key engagement events in chronological order and community input that was considered during the development of the CAP 2.0. Public input will continue to be received throughout the public draft comment period. More details of the public engagement process are available in **Appendix C.**

Table 8 CAP Update Engagement Summary

Engagement Event	Date of Event	Objectives
Subcommittee Meeting #1	July 1st, 2021	• Present our engagement approach. • Identify initial vision and priorities for the CAP. • Review the outreach toolkit and give feedback to staff on the best way to roll out the toolkit in the community.
Stakeholder Meeting #1	July 1st, 2021	• Build early awareness of the CAP process. • Gather high-level ideas, priorities, and concerns. • Build relationships with key stakeholder groups.
Public Survey #1	July 23rd - September 19th, 2021	• Assess awareness of climate change knowledge. • Identify community climate change priorities. • Identify community-supported climate change strategies. • Identify potential community barriers for implementing climate change strategies.
Public Workshop #1	July 29th, 2021	• Build early awareness of the CAP goals and process among the general public. • Gather high-level priorities, and concerns about climate action in Cupertino. • Gather initial ideas for potential actions to include in the CAP.
Subcommittee Meeting #2	August 19th, 2021	• Review draft CAP targets • Brainstorm high impact strategies and actions to achieve draft CAP targets • Review upcoming public engagement and options for outreach activities
Stakeholder Meeting #2 – Housing Advocates	September 30th, 2021	• Build early awareness of the CAP process. • Gather high-level ideas, priorities, and concerns. • Build relationships with key stakeholder groups. • Focus on advocates for affordable and low-income housing.

Engagement Event	Date of Event	Objectives
Public Workshop #2	October 11th, 2021	• Provide updates about the Cupertino CAP's emission forecasts and GHG reduction targets. • Present the draft mitigation measures. • Gather feedback about the draft mitigation measures.
Public Survey #2	September 30th - October 25th, 2021	• Assess level of support for various focus areas' Mitigation Measures as a whole. • Assess level of support for key mitigation measures within each focus area.
Stakeholder Meeting #3	May 3, 2022	• Review the draft Climate Action Plan and its associated mitigation measures and actions. • Gather ideas, priorities, and concerns on the proposed mitigation measures and actions.
Public Survey #3	May 17, 2022 - July 23, 2021	• Public review of the draft CAP document and to provide input.

7 A Different Kind of Plan

7.1 Regional Climate Efforts, Solutions, and Partnerships

Compact of Mayors: The Compact of Mayors is a global coalition of mayors and city officials committed to reducing local GHG emissions, enhancing city resilience to climate change and transparently tracking their progress towards these aims. These networks work to support their members in decreasing city-level emissions, reducing vulnerability and to enhancing resilience to climate change, in a manner that is consistent and complimentary with national level climate actions and efforts. Cupertino committed to the Global Covenant of Mayors in 2015 and remains dedicated to making strides towards clean energy and carbon neutrality.

County Climate Roadmap 2030: Santa Clara County is currently developing the Climate Roadmap 2030 which will outline actions the County and partners will take to reduce GHG emissions. The Roadmap will serve to align existing efforts to reduce GHG emissions among cities that have already adopted CAPs, prioritize actions in unincorporated areas of the County, and help leverage and facilitate regional partnerships to further encourage sustainable and resilient communities. The County aims to use the Roadmap as a tool to increase coordination and collaboration in efforts to reach shared sustainability goals.

The Roadmap will include the following:

- A countywide GHG emissions inventory and forecast
- An online interactive map tool that will provide a comprehensive overview of the cities, organizations, institutions, and companies working on climate action in Santa Clara County
- Community and partner input
- An implementation roadmap

Silicon Valley Clean Energy (SVCE): SVCE is the community-owned electricity provider for several south bay cities including Cupertino. SVCE developed its Decarbonization Strategy & Programs Roadmap with extensive community input to help guide community electrification, which entails switching from relying on fossil fuel use in homes, buildings, and transportation to electricity from renewable sources. By 2030, Silicon Valley Clean Energy programs aim to cut energy-related pollution in half from the 2015 baseline. That equates to preventing 2 million MT CO_2e from being released into the environment each year.

Santa Clara Valley Transportation Authority (VTA): The VTA's Sustainability Program seeks to conserve of natural resources, reduce GHG emissions, prevent pollution, and increase the use of renewable energy and materials. VTA is a founding signatory of the American Public Transportation Association's (APTA) Sustainability Commitment and achieved Gold Level Recognition for its sustainability efforts. VTA's Sustainability Plan 2020

identified both short-term and stretch targets for key climate and environmental performance indicators including: GHG emissions, criteria air pollutants, building energy, fleet energy, water usage, and waste diversion. In 2021, VTA was selected as a recipient of the Fiscal Year 2021-2022 Sustainable Communities Grant Program, receiving a total award of approximately $1 million under the Sustainable Communities Competitive Grant category. The funding will support VTA in conducting a Climate Action and Adaptation Plan (CAAP). In developing the CAAP, VTA will identify specific actions that could minimize contributions to climate change and adapt and build resilience to long-term climate impacts. The CAAP process will begin in 2023.

7.2 Ambitious Timeline

The Cupertino GHG emission targets are more aggressive than the State goals to reduce GHG emissions 40 percent below 1990 levels by 2030 (in compliance with SB 32) and to achieve Statewide carbon neutrality by 2045 (in compliance with EO B-55-18). Specifically, Cupertino GHG emissions targets are 3.39 MT CO_2e per person by 2030 and 0.00 MT CO_2e per person by 2040.

The City of Cupertino has established three phases for implementation:

- **Phase 1** actions will begin implementation at CAP adoption (2022) or before. These actions have been prioritized due to their importance, cost-effectiveness, or the availability of resources for implementation. Phase 1 actions may not be completed in 2022 but will be completed by the end of Phase 2.
- **Phase 2** actions will begin implementation between 2023 and 2026. These actions may require additional resources such as staff time, funding and financing, or there may need to be additional education and outreach conducted prior to implementation.
- **Phase 3** actions will begin implementation after 2026. These actions may be less critical in the short term or simply require more significant resources to implement.

7.3 Reduction Strategy Framework

As part of the CAP Update process, the City of Cupertino has developed a comprehensive set of measures and actions for reducing communitywide GHG emissions in all sectors to achieve the City's climate action targets. The City has also developed a set of measures and actions for offsetting GHG emissions through carbon sequestration, established under a new sector called *Carbon Sequestration*. Measures and actions are organized according to the following hierarchy:

1. **Sectors**: Sectors define the GHG emissions category in which the GHG reductions will occur and include Building Energy, Transportation, Waste, Water and Wastewater, and Carbon Sequestration.
2. **Measures**: Measures identify specific goals and GHG reduction necessary to address GHG emissions in each sector and achieve the overarching GHG reduction targets.

3. **Actions**: Actions are the specific steps the City will take in support of each measure, which together will accomplish the measure goal. Actions concretely identify the mechanisms required for implementation. Actions are developed to ensure that each of the key pillars, or categories of action, are met.

Each action contains a rough-order-of-magnitude cost range for the City to consider when organizing its implementation plan. These cost ranges provide a way to evaluate relative costs from among the different actions. The cost ranges are as follows:

Low: $0 - $40,000

Low-Medium: $40,001 - $100,000

Medium: $100,001 - $1,000,000

High: $1,000,001 - $2,000,000

Measures and actions can be either quantitative or supportive, depending on whether they directly result in GHG emissions reductions or support direct reductions.

- **Quantitative:** Quantitative measures and actions result in GHG emissions reductions that can be quantified and summed to show how Cupertino will make progress towards and meet its climate action targets. The emissions reductions expected from implementation of these measures and actions are supported by substantial research that establishes their effectiveness for achieving Cupertino's GHG emissions reduction targets.
- **Supportive:** Supportive measures and actions are critical to the overall success of the CAP and provide support so that the quantitative measures and actions will be successfully implemented. Though these measures and actions may also be quantifiable and have substantial evidence to support their overall contribution to GHG reduction, they are not quantified for one of several factors – including a low GHG reduction benefit, indirect GHG reductions, or potential for double-counting – and do not contribute directly to the expected GHG reduction targets.

7.4 Key Pillars of Climate Action

Community-focused climate action often requires community-level behavioral changes and buy-in to be implementable and successful. This means that many factors aside from GHG emissions reductions need to be considered and balanced. To ensure the CAP actually achieves the City's ambitious targets, the actions supporting each measure were developed to be consistent with a set of key pillars. Each key pillar emphasizes specific criteria that play an essential role in the implementation of climate action. The key pillars are:

- **Structural Change**: Includes ordinances, requirements, new programs, pilot programs, or other policy that provides some guarantee of behavior change going forward. Structural change actions are usually quantitative actions and provide the GHG emissions reduction mechanism for the associated measure to be effective.
- **Studies & Plans**: Includes feasibility studies, City-led plans, or other investigative or strategy documents that help the City develop a strategy for measure or action implementation, especially for measures or actions that are more controversial or complicated.
- **Funding:** Includes funding, financing, and other capital avenues for ensuring that the associated measure's costs are supported.
- **Equity:** Includes actions to mitigate for potential equity impacts of other actions, such as re-investment into underserved communities, or policies and programs to protect against an increased potential for displacement or increased cost burdens in the community.
- **Engagement:** Includes outreach, education, and engagement campaigns to incentivize community participation in the CAP and the new programs, policies, and incentives that have the potential to move the needle on GHG reductions.
- **Partnerships:** Includes actions that focus on partnerships with community-based organizations, other public agencies, and private-sector partners to create new programs the City cannot achieve alone.

Some communities will have fewer resources to respond to and recover from climate impacts because of economic, health, environmental, and other inequities.[37] The CAP seeks to protect vulnerable communities by increasing access to resources and ensuring that its actions do not contribute to inequities or cost burdens. As part of the implementation of this CAP 2.0, the City will continue to identify vulnerable communities and adjust its policies to ensure that all of Cupertino's diverse and multicultural population have access to the same opportunities and resources.

[37] Governor's Office of Planning and Research. 2017. Executive Order B-30-15 Resiliency Guidebook: Vulnerable Communities. Available: https://opr.ca.gov/docs/20180312-Vulnerable_Communities_Descriptions.pdf Accessed March 2022.

7.5 Co-Benefits of GHG Reduction Measures

Climate action measures will also produce numerous co-benefits in addition to GHG emissions reductions. Co-benefits refer to the positive impacts that a climate action policy will have on other community goals. The co-benefits associated with this CAP Update's actions include:

Enhanced Public Health & Safety

- Cleaner air leads to fewer respiratory illnesses
- More active, accessible, and livable neighborhoods
- Natural gas is responsible for increased levels of nitrogen oxide emissions in homes and other buildings – several times higher than outdoor air quality standards – and is disproportionately linked with respiratory illness, including asthma.[38] Natural gas is also getting more expensive. Without a transition plan, the bill for running a gas furnace could increase 500 percent by 2050, due to increasing natural gas infrastructure costs coupled with a declining demand for fuel as appliances become more energy efficient.[39]

Climate Change Resilience

- Increased ability of residents and businesses to adapt and reduce the impact of hazards such as extreme heat days and to recover quickly from hazards when unavoidable.
- Planting trees for carbon sequestration and increasing tree canopy cover can help keep streets and neighborhoods cooler.[40] Actions can also enhance community cohesion—the

[38] National Asthma Council Australia: Fact Sheets."Gas Stoves and Asthma in Children". Available: https://www.nationalasthma.org.au/living-with-asthma/resources/patients-carers/factsheets/gas-stoves-and-asthma-in-children Accessed January 2022.

[39] GridWorks. "California's Gas System in Transition". 2019. Available: https://gridworks.org/wp-content/uploads/2019/09/GW_Calif-Gas-System-report-1.pdf Accessed January 2022.

[40] Popular Science. "Here's How Many Trees Are Required to Cool a City Street". 2019. https://www.popsci.com/shade-city-streets-trees-cooling/ Accessed January 2022.

networks of formal and informal relationships among neighbors that foster a mutually supporting human environment.[41],[42]

Biodiversity & Ecosystem Services

- More healthy, biodiverse, and functional ecosystems.
- Actions that improve the health of local ecosystems can also result in a variety of public benefits including reducing pollutants in local creeks and runoff to the bay, providing species habitat which supports a more biodiverse landscape, improving water and air quality, reducing local flood risk, and providing recreation benefits for the community enjoyment.

Affordable Housing & Local Development

- Through alignment with the California Environmental Quality Act (CEQA), this CAP can help facilitate local development that will enhance human-centered economic corridors and the availability of affordable housing.
- A key co-benefit of a comprehensive and updated CAP is the promotion of thoughtful development that will complement the City's environmental goals. This is achieved by creating a clear pathway for new development so it can align with Cupertino's greenhouse gas reduction plan.

Jobs Creation

- Climate actions that support clean energy adoption and sustainable business practices area core part of supporting the creation of high-quality, well-paid, and inclusive jobs that will in turn support Cupertino's climate targets and continued economic prosperity.

Cost Savings

- Lower and more stable utility bills for municipal, business, and residential community members
- Efficiencies and waste reduction can result in project and other operations cost-savings

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41 University of Washington. "Green Cities: Good Health". 2013. Available: https://depts.washington.edu/hhwb/Thm_Community.html. Accessed January 2022; TNC Washington. "Outside Our Doors". 2016. Available: https://www.nature.org/content/dam/tnc/nature/en/documents/Outside_Our_Doors_report.pdf . Accessed January 2021.

42 Newell, et. al., *The International Journal of Climate Change: Impacts and Responses*. 2018. "Climate Action Co-Benefits and Integrated Community Planning: Uncovering the Synergies and Trade-Offs," Available: https://doi.org/10.18848/1835-7156/CGP/v10i04/1-23. Accessed January 2022.

8 Cleaning the Air (Renewable Energy and Electrification)

8.1 Context

The focus strategy for the energy sector is electrification coupled with carbon-free electricity. All-electric buildings are powered 100 percent by electricity and when coupled with carbon-free electricity, their operating energy footprint becomes carbon-free.

Renewable Energy

The City of Cupertino's building energy (BE) measures are dependent on leveraging the renewable energy that Silicon Valley Clean Energy (SVCE) provides the community. Using 100 percent clean electricity from SVCE, instead of natural gas, propane, or other electricity sources, to power buildings reduces the GHG emissions associated with building operations to zero or near-zero. Measure BE-1 directs the City to work with SVCE to lower existing residential and commercial opt-out rates, which increases the GHG reduction potential for SVCE's renewable electricity.

Electrification

Electrification of new buildings is a cost-effective and socially equitable way many cities in California are reducing GHG emissions and protecting public health. All-electric buildings can be more efficient, and can produce lower energy bills.[43] Moreover, it is expected that natural gas prices will increase in the future, potentially leaving building owners that don't electrify with the burden of

[43] Kenney et al., (California Energy Commission (CEC). "California Building Decarbonization Assessment". 2021. Available: https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment Accessed January 2022.

ever-higher natural gas bills.[44] Lastly, burning natural gas in poorly ventilated areas can cause a drastic increase of harmful indoor pollutants that are linked to increased risk of respiratory illnesses, so switching to electric appliances is a step towards improving public health.[45]

While the City has already adopted an electrification reach code for new construction (included in the CAP as Measure BE-4) which requires developers for most building types to provide all-electric systems, GHG emissions from Cupertino's existing buildings must also be reduced to achieve the City's climate action targets. Measures BE-2 and BE-3 provide frameworks of updated regulations, programs, funding mechanisms, education, and advocacy to drive electrification of existing residential and commercial buildings.

Measure BE-5 recognizes that removing natural gas entirely will be a long-term and complex challenge. Gas still provides critical services for industry, resiliency, and power supply. Electrification of all types of systems may not be possible with today's technologies, and retrofitting existing systems demands more technological innovation, systems thinking, and a deep consideration of equity. This CAP provides some guidance on initiatives that can reduce emissions while managing a responsible transition away from fossil fuels.

8.2 Measures and Actions Detail

Measure BE-1: Reduce non-SVCE usage rate to 2 percent for residential and 10 percent for commercial by 2030 and maintain through 2040.

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure BE-1 are as follows:

Co-Benefits

- Affordable Housing & Local Development
- Cost Savings

GHG Emissions Reductions

- 2030: 0.012 MT CO_2e/person
- 2040: 0.004 MT CO_2e/person

Actions to support Measure BE-2 are included in Table 9.

[44] Aas et. al., CEC. "The Challenge of Retail Gas in California's Low-Carbon Future - Technology Options, Customer Costs, and Public Health Benefits of Reducing Natural Gas Use". 2020. Available: https://www.energy.ca.gov/publications/2019/challenge-retail-gas-californias-low-carbon-future-technology-options-customer Accessed February 2022.

[45] RMI. "Gas Stoves: Health and Air Quality Impacts and Solutions." 2020. Available: https://rmi.org/insight/gas-stoves-pollution-health/ Accessed February 2022.

Table 9 Measure BE-1 Actions

Action ID	Action Description
BE 1.1	Work with SVCE to conduct an annual analysis of non-SVCE and direct access usage rates in the City of Cupertino to understand how many and why residents and businesses opt out of SVCE or use direct access electricity. Key Pillar: Studies & Plans City Partners: SVCE Timing: Phase 2 Cost: Low
BE 1.2	Investigate feasibility of adopting an energy benchmarking program in Cupertino. Evaluate similar programs and determine how energy data would be reported and reviewed, if standards could be set to require energy efficiency improvements, and how much staff time would be required to maintain the program. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
BE 1.3	Establish an energy benchmarking program in Cupertino that requires large commercial entities (over 10,000 square feet) to report their energy usage and energy procurement details. Key Pillar: Structural Change City Partners: Medium and large commercial entities Timing: Phase 3 Cost: Low-Medium

BE 1.4	Develop a program to provide SVCE green energy for rental units and households in the Below Market Rate (BMR) rental and ownership programs. Key Pillar: Equity City Partners: City's BMR housing administrator, SVCE Timing: Phase 2 Cost: Medium
BE 1.5	Develop a local education program detailing and promoting the benefits of opting in to SVCE service. Key Pillar: Engagement Timing: Phase 1 Cost: Low
BE 1.6	Partner with local community organizations that focus on climate and other social causes to promote the cost efficiency and benefits of SCVE. Solicit applications from among the community to take part in SVCE's Innovation Onramp and other grant funding programs. Key Pillar: Partnerships Timing: Phase 1 Cost: Low

Measure BE-2: Electrify existing residential buildings to reduce annual residential natural gas usage from 129 therms per person in 2018 to at most 71 therms per person in 2030 and 16 therms per person in 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure BE-2 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Affordable Housing & Local Development
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

2030: 0.290 MT CO_2e/person

2040: 0.566 MT CO_2e/person

Actions to support Measure BE-2 are included in Table 10.

Table 10 Measure BE-2 Actions

Action ID	Action Description
BE 2.1	Develop a residential building electrification strategy (RBES) to aid in development of a residential building electrification ordinance which: 1. Include a detailed existing building analysis to understand current natural gas end uses and scenarios to electrify 2. Include an electrification costs analysis that explores the up-front costs of electrification as well as ongoing energy costs for the end user (homeowners, landlords, and renters) after electrification 3. Evaluates impacts to renters, renter/landlord dynamics 4. Identifies potential impacts to electrical grid resiliency 5. Identifies and develops protections against potential equity concerns/impacts of electrification 6. Identifies funding and financing opportunities for residential electrification 7. Identify the City staff resources needed to enforce a new electrification ordinance Key Pillar: Studies & Plans City Partners: SVCE Timing: Phase 1 Cost: Low-Medium
BE 2.2	Identify and partner with local community-based organizations with connections to low-income and fixed income people, historically underserved communities, elders, disabled individuals with access needs to assist in development of the RBES. Key Pillar: Equity City Partners: Community organizations Timing: Phase 1 Cost: Low

BE 2.3	Conduct engagement efforts for the public and targeted to low-income and fixed income people, historically underserved communities, elders, disabled individuals with access needs during development of the RBES to understand the community's concerns around electrification. Key Pillar: Engagement Timing: Phase 1 Cost: Low
BE 2.4	Adopt an electrification ordinance for existing residential buildings by 2023 to be implemented through the building permit process which bans expansion of natural gas infrastructure and requires either electrification of appliances or a disconnect from the gas system at time of replacement and major renovation. Key Pillar: Structural Change Timing: Phase 2 Cost: Low-Medium
BE 2.5	Define equity metrics for ordinance enforcement based on feedback from low-income and fixed income people, historically underserved communities, elders, disabled individuals with access needs. Equity metrics should be designed to prevent displacement and ensure that end-user energy costs for low-income populations will not be greater after electrification than before. Design compliance support programs such as technical assistance to help permit applicants with compliance. Key Pillar: Equity Timing: Phase 2 Cost: Low

BE 2.6	Enforce ordinance compliance through a comprehensive permitting compliance program, to be developed based on the results of the feasibility study in Action 1. Structure the program to include, as determined necessary, routine training of staff, dedicating staff time to building inspections, charging fees for noncompliance, providing easy to understand compliance checklists online and with permit applications, and facilitating permitting online. Evaluate the effectiveness of the program on a biannual basis to avoid potential issues such as reduced permit application rates. Key Pillar: Structural Change Timing: Phase 2 Cost: Medium
BE 2.7	Actively participate in regional permit streamlining efforts for all-electric building upgrades, EV charging, and battery storage. Key Pillar: Partnerships Timing: Phase 2 Cost: Low
BE 2.8	Work with the local contractors, realtors, homeowner associations, and labor unions to develop a comprehensive building code and compliance training program, including hosting workforce development trainings discussing the benefits and technical requirements of electrification. Consider working with regional partners to maintain a database of qualified contractors and consultants for electrification retrofits. Key Pillar: Engagement City Partners: Local contractors, realtors, homeowner associations, educational institutions, and labor unions Timing: Phase 2 Cost: Low

BE 2.9	Commit to electrifying the City's owned Below Market Rate (BMR) rental and housing stock at a neighborhood level by 2040. Establish a plan, budget, and schedule for implementing this action by 2024. Key Pillar: Equity City Partners: BMR program administrator, BayREN Timing: Phase 3 Cost: High
BE 2.10	Create a dedicated fund to support BMR rental and housing upgrades, to be supported by grants using an existing partnership such as the BayREN program. Engage with private and public capital providers to develop funding and program models for consideration. Key Pillar: Funding City Partners: BMR program administrator, BayREN, private and public capital providers Timing: Phase 3 Cost: Medium
BE 2.11	Work with PG&E to identify opportunities for natural gas infrastructure pruning to redirect utility resources to electrification retrofit projects and reduce the chance of stranded assets. Stranded assets are functional natural gas infrastructure with ongoing maintenance costs that has become obsolete due to electrification. Work with PG&E to identify additional funding as needed for the abandonment/removal of the infrastructure. Consider piloting this approach with a group of municipal facilities. Key Pillar: Partnerships City Partners: PG&E Timing: Phase 3 Cost: Low

BE 2.12	Collaborate with the County and other cities in the region to advocate for regulatory changes at the state and federal level to allow neighborhood level electrification and natural gas pruning. Consider also supporting federal carbon pricing proposals in the City's legislative platform. Key Pillar: Partnerships City Partners: Neighboring jurisdictions Timing: Phase 3 Cost: Low
BE 2.13	Seek out funding partnerships with financiers and work with partners such as SVCE and BayREN to fund a program specifically for decarbonization retrofits, such as a local turnkey retrofit program that leverages existing funding, which offers low-cost financing of electrification and energy efficiency retrofits for residents and local businesses. Key Pillar: Funding City Partners: Public and private capital providers, energy efficiency program administrators Timing: Phase 2 Cost: Medium
BE 2.14	Develop a program dedicated to understanding, streamlining, and expanding energy and electrification turnkey, rebate, and financing programs (e.g., PACE, CHEEF, and utility-offered incentive programs). Staff would also be responsible for supporting residents with rebate applications, with a focus on low-income residents Key Pillar: Funding City Partners: Alternative financing programs such as PACE, CHEEF, and utility incentives Timing: Phase 2 Cost: Medium

Measure BE-3: Electrify existing commercial buildings to reduce annual commercial natural gas usage from 119 therms per person in 2018 to at most 90 therms per person in 2030 and 54 therms per person in 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure BE-3 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- 2030: 0.190 MT CO_2e/person
- 2040: 0.366 MT CO_2e/person

Actions to support Measure BE-3 are included in Table 11.

Table 11 Measure BE-3 Actions

Action ID	Action Description
BE 3.1	Inform and facilitate energy master planning work around electrification for commercial business owners and large developers. Build a partnership with and distribute technical support to the business community with the aim of identifying, piloting, and scaling large energy efficiency and electrification projects. Key Pillar: Studies & Plans City Partners: Local business associations and engineering firms Timing: Phase 1 Cost: Low
BE 3.2	Develop a commercial building electrification strategy (CBES), building on the existing Baseline Buildings Study from SVCE (2020), with a detailed commercial natural gas usage analysis, analysis of potential impacts to the local commercial sectors, and electrification costs analysis to aid in development of a commercial building electrification ordinance. Key Pillar: Studies & Plans City Partners: SVCE Timing: Phase 2 Cost: Low-Medium
BE 3.3	Conduct engagement efforts for the commercial sector during development of the CBES to understand potential concerns and barriers to commercial electrification. Engage with BAAQMD in the development of the CBES to coordinate on the approach to emergency power and baseload power generation systems which commonly use natural gas. Key Pillar: Engagement Timing: Phase 2 Cost: Low

BE 3.4	Conduct outreach to small business and minority-owned businesses to understand potential equity impacts of a commercial building electrification ordinance. Key Pillar: Equity City Partners: Cupertino business associations Timing: Phase 2 Cost: Low
BE 3.5	By 2024, adopt an electrification ordinance for existing commercial buildings to be implemented through the building permit process, which bans expansion of natural gas infrastructure, requires electrification of natural gas appliances at time of major renovation and time of replacement where technologically feasible (exceptions can be made where all-electric alternatives to do not exist or are a significant cost burden, to be further defined based on results of the CBES). Key Pillar: Structural Change Timing: Phase 2 Cost: Low-Medium
BE 3.6	Enforce existing buildings electrification ordinance compliance through the same permitting compliance program as for residential building electrification. Key Pillar: Structural Change Timing: Phase 2 Cost: Medium
BE 3.7	Conduct engagement efforts for the commercial sector to identify ways the City can support commercial battery storage installations and improve local grid resiliency beyond what will be required in the 2022 California Building Energy Code's commercial battery storage and solar installation requirements. Key Pillar: Engagement Timing: Phase 2 Cost: Low

BE 3.8	Work with SVCE and PG&E to develop or expand commercial rebate program and incentivize commercial all-electric retrofits and battery storage installations. Key Pillar: Funding Timing: Phase 2 Cost: Low
BE 3.9	Create a program to generate interest and secure partnerships among local businesses and institutions for the purpose of seeking out grants or initiatives. Leverage this program to facilitate funding opportunities for commercial business electrification. Key Pillar: Partnerships Timing: Phase 2 Cost: Low-Medium
BE 3.10	Develop a program that funnels Cupertino businesses into the SVCE Innovation Onramp grant program or similar grant offerings. Key Pillar: Funding Timing: Phase 3 Cost: Low-Medium

Measure BE-4: Require new residential and commercial development to be all-electric at time of construction

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure BE-4 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Jobs Creation
- Cost Saving

GHG Emissions Reductions

- 2030: 0.067 MT CO_2e/person
- 2040: 0.221 MT CO_2e/person

Actions to support Measure BE-4 are included in Table 12.

Table 12 Measure BE-4 Actions

Action ID	Action Description
BE 4.1	Adopt an electrification ordinance for new residential and commercial development which requires developers to build all-electric at time of construction. Actively maintain the electrification ordinance through each tri-annual code cycle. Key Pillar: Structural Change City Partners: SVCE, California Energy Commission Timing: Phase 1 (already implemented) Cost: Low

Measure BE-5: Support procurement of carbon-free fuels in lieu of natural gas for existing and new projects that cannot be electrified

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure BE-5 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Cost Saving

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure BE-5 are included in Table 13.

Table 13 Measure BE-5 Actions

Action ID	Action Description
BE 5.1	Energy consumption by Apple facilities is significant in Cupertino. Coordinate with Apple during preparation of future community inventories to ensure that Apple is continuing to procure biofuel for their Apple Park fuel cell through a legitimate book and claim process and that the data is reflected correctly in Cupertino's community inventory according to the latest inventory guidance and protocols from CARB and ICLEI. Key Pillar: Structural Change City Partners: Apple, Bay Area Air Quality Management District Timing: Phase 1-3 Cost: Low
BE 5.2	Develop requirements for future commercial projects with fuel cells, stationary generators, or other natural gas equipment that cannot be electric to coordinate with the City and procure biofuel or other carbon-free fuel for operation of the equipment. Coordinate this action with the Bay Area Air Quality Management District, which conducts regular analysis on carbon-free alternatives to diesel generators under the Diesel-Free by '33 program. Key Pillar: Studies & Plans City Partners: Bay Area Air Quality Management District, California Air Resources Board Timing: Phase 3 Cost: Medium
BE 5.3	Work with the City's natural gas provider, ABAG POWER, to develop market alternatives to natural gas that provide legitimate carbon reduction opportunities, such as renewable diesel fuels or bio-based fuels. Consider purchasing these fuels at a price premium. Key Pillar: Partnerships City Partners: ABAG POWER, CalRecycle Timing: Phase 1 Cost: Medium

9 Connecting Communities (Transportation, Land Use)

9.1 Context

Transportation is the largest GHG emissions sector in Cupertino and has only grown in California since 1990.

The City of Cupertino envisions an inviting and safe walking and biking environment that promotes active living and healthy transportation choices, enhances the quality of life for all community members and visitors, and is a seamless and integral part of the City's connected, multi-modal transportation network. The City cannot require that people change their transportation behaviors, but it is committed to implementing the infrastructure updates that will make more sustainable choices attractive for the community.

These transportation measures (TR) prioritize reducing vehicle miles travelled (VMT) first, by improving active and public transportation, then shifting the remaining VMT to electric vehicles. While in theory, 100 percent electrification of all vehicles in Cupertino could achieve zero-emissions in the transportation sector without reducing VMT, the City recognizes that cars and roadways carry huge amounts of embodied emissions not accounted for in the inventory, over which the City has little control. Reducing VMT carries additional benefits outside of GHG emissions reductions as well, including reduced congestion, reduced space needed for roadways and parking, local economic revitalization, and lifestyle improvements.

To achieve a greater than 15 percent mode shift to active transportation (Measure TR-1), the City plans to improve active transportation infrastructure, like bikeways and sidewalks. To achieve a greater than 29 percent mode shift to public transit (Measure TR-2), the City plans to improve public and shared transit programs and infrastructure. While the City cannot require its residents or businesses to buy Zero-Emission Vehicles (ZEVs), Measure TR-3 will ensure the infrastructure and incentives are present in the City to begin to remove present barriers to passenger and commercial ZEV adoption. Measure TR-4 explores the creation of behavior disincentives for owning fossil fuel-powered passenger vehicles, such as limited parking options, local taxes or fees. Finally, Measure TR-5 establishes a goal of decarbonizing 34 percent of off-road equipment by 2030.

9.2 Measures and Actions Detail

Measure TR-1: Develop and implement an Active Transportation Plan to achieve 15 percent of active transportation mode share by 2030 and 23 percent by 2040

The City of Cupertino currently has a Bicycle Transportation Plan, adopted in 2016, and a companion document, the Pedestrian Transportation Plan, adopted in 2018. The City's progress report shows nine bike segments completed, including several miles of Class IV separated bikeway. Measure TR-1 suggests including an Active Transportation component into the next update of these documents. Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure TR-1 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- 2030: 0.048 MT CO_2e/person
- 2040: 0.071 MT CO_2e/person

Actions to support Measure TR-1 are included in Table 14.

Table 14 Measure TR-1 Actions

Action ID	Action Description
TR 1.1	As part of the City's active transportation planning, identify priority projects to connect neighborhoods with commercial areas via bike/ped paths, repainted roadways, and e-bike share. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium
TR 1.2	Collaborate with the County, VTA, and SVCE to connect Cupertino's bicycle network to cross-jurisdiction bicycle superhighways and other e-bike networks as feasible. Key Pillar: Partnerships City Partners: Santa Clara County, VTA, SVCE Timing: Phase 1 Cost: Low
TR 1.3	Engage the Bicycle Pedestrian Commission, Safe Routes to School network, and community groups to identify additional short-term and long-term bikeway and pedestrian infrastructure improvement projects to implement. Key Pillar: Partnerships City Partnerships: City commissions Timing: Phase 2 Cost: Low

TR 1.4	Ensure there is equitable access to safe bicycle and pedestrian infrastructure in all areas of the city. Prioritize new bicycle and pedestrian facilities (e.g., bike paths, bike parking, sidewalks) in areas with underdeveloped facilities and in areas with lower-income populations. Key Pillar: Equity Timing: Phase 1 Cost: Low-Medium
TR 1.5	Continue to implement the 2018 Pedestrian Plan and the 2016 Bicycle Transportation Plan list of prioritized projects, with accelerated completion of all planned bike paths by 2030. Key Pillar: Structural Change Timing: Phase 1-3 Cost: High
TR 1.6	Re-stripe arterial, minor collector, and major collector roads (as mapped in the 2016 Bicycle Transportation Plan) without existing designated bike lanes to include bike lanes and reduce the width of existing car lanes/travel determined by the bicycle and pedestrian plans. Key Pillar: Structural Change Timing: Phase 2 Cost: High
TR 1.7	Conduct a pilot program, including a plan for pilot implementation, that designates the road space on select streets specifically for bikes and is closed to through-traffic motor vehicles. As part of the plan, consider location and extent of pilot program based on transportation data analysis, and develop success tracking metrics to inform potential pilot expansion. Key Pillar: Structural Change Timing: Phase 2 Cost: Medium

TR 1.8	Evaluate and update the City's Zoning Code, Transportation Demand Management Ordinance, and/or California Green Building Code to ensure the City requires installation of accessible, shaded, and secure bicycle parking for new commercial development and retrofits. Key Pillar: Structural Change Timing: Phase 1 Cost: Low
TR 1.9	Improve the bike/e-bike parking network to reduce theft and increase rider attraction. This would include surveying existing bike parking facilities throughout the city and developing and implementing a plan to improve these with preference given to improving bike/e-bike parking facilities near public transit stops to improve and expand access to transit (i.e., first and last-mile access). Key Pillar: Studies & Plans Timing: Phase 2 Cost: Low-Medium
TR 1.10	Design a micro-mobility program that explores expansion of the use of electric bikes and scooters and shared micro-mobility options. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
TR 1.11	Bring an e-bike share or e-scooter share to Cupertino with focus on placing hubs near neighborhood entry points and commercial areas. Adopt an ordinance to allow and manage the mobility sharing program. Key Pillar: Structural Change Timing: Phase 2 Cost: Low

TR 1.12	Pilot a program to provide free or reduced-price access to e-bikes or other micro-mobility options to low-income residents and students. Key Pillar: Equity Timing: Phase 2 Cost: Low-Medium
TR 1.13	Establish a program for researching and obtaining grant funding for bike and pedestrian network expansion. Key Pillar: Funding Timing: Phase 1 Cost: Low-Medium

Measure TR-2: Implement public and shared transit programs to achieve 29 percent of public transit mode share by 2030 and maintain through 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure TR-2 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- 2030: 0.269 MT CO_2e/person
- 2040: 0.256 MT CO_2e/person

Actions to support Measure TR-2 are included in Table 15.

Table 15 Measure TR-2 Actions

Action ID	Action Description
TR 2.1	Develop a plan for on-demand community shuttle (Via-Cupertino) expansion and designated streets for transit based on data collected by the City. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium
TR 2.2	Include public transit in the designated streets pilot program from Measure TR 1.7. Key Pillar: Structural Change City Partner: VTA Timing: Phase 2 Cost: Low-Medium
TR 2.3	Aggressively expand the on-demand community shuttle to meet shared transit goals and support vulnerable populations: secure funding to support transition to an all-electric fleet, maintain bike racks on all fleet vehicles, increase service and coverage, wheelchair accessibility, and offer free or deeply subsidized passes to students attending Cupertino schools and low-income individuals. Key Pillar: Structural Change City Partners: Neighboring jurisdictions, school districts, regional employers Timing: Phase 2 Cost: High
TR 2.4	Partner with VTA and neighboring cities to develop high-capacity transit service along the Stevens Creek Boulevard/I-280 corridor. Key Pillar: Partnerships City Partners: VTA, neighboring jurisdictions Cost: Low-Medium

TR 2.5	Conduct a free public transit pilot program that provides free public transit on VTA and the Via-Cupertino Shuttle to students, foster youth, and unhoused youth in Cupertino. Key Pillar: Equity City Partners: Community based organizations, VTA Timing: Phase 2 Cost: Medium
TR 2.6	Require medium to large-sized employers (25 employees or more) to develop a Transportation Demand Management (TDM) Plan. TDM plans should include subsidies for employees to bike, walk, or carpool, and provide free transit passes for all employees. Key Pillar: Studies & Plans City Partners: Cupertino businesses Timing: Phase 2 Cost: Low
TR 2.7	Require new multi-family developments to install a car share or provide e-bikes/e-scooters for tenants. Key Pillar: Structural Change City Partners: Real estate developers Timing: Phase 1 Cost: Low
TR 2.8	Establish a program for supporting regional transportation coordination for improving region-wide service, such as establishing prioritized service, obtaining grant funding for service expansion, or headway reductions. Key Pillar: Partnerships City Partners: VTA, neighboring jurisdictions Timing: Phase 2 Cost: Medium

Measure TR-3: Increase zero-emission vehicle (ZEV) adoption[46] to 35 percent for passenger vehicles and 20 percent for commercial vehicles by 2030 and 100 percent for all vehicles by 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure TR-3 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Cost Savings

GHG Emissions Reductions

- 2030: 0.457 MT CO_2e/person
- 2040: 1.960 MT CO_2e/person

Actions to support Measure TR-3 are included in Table 16.

[46] For the purposes of this document and the Cupertino CAP Update, ZEV adoption refers to percent of vehicles registered in Cupertino that are ZEV.

Table 16 Measure TR-3 Actions

Action ID	Action Description
TR 3.1	Conduct a survey of existing publicly accessible electric vehicle chargers, their locations, and their kW hour charging speed, and identify a prioritized list of locations for new electric vehicle charging stations with consideration for equitable distribution of chargers to residents of multi-family homes, low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium
TR 3.2	Leverage public and private partnerships to add 719 new publicly accessible Level 2 and 3 electric vehicle charging stations to the City by 2030. Key Pillar: Structural Change Timing: Phase 1-3 Cost: High
TR 3.3	Review electric vehicle infrastructure reach code for new development and consider re-adoption of the reach code or strengthening electric vehicle installation requirements at next code cycle. Key Pillar: Structural Change Timing: Phase 2 Cost: Low
TR 3.4	Create a local reach code ordinance for installation of electric vehicle charging infrastructure at existing multi-family and commercial sites. Work with SVCE on model code development and coordinate efforts with other SVCE cities. Key Pillar: Structural Change Timing: Phase 3 Cost: Low

TR 3.5	Continue to maintain and advertise a streamlined electric vehicle infrastructure permitting process in accordance with SB 1236 and AB 970. Key Pillar: Structural Change Timing: Phase 1 Cost: Low
TR 3.6	Investigate commercial vehicle fleets in Cupertino and identify businesses/employers to partner with for accelerating zero emission vehicle (ZEV) adoption. Key Pillar: Partnerships City Partners: Cupertino businesses Timing: Phase 1 Cost: Low
TR 3.7	Work and collaborate with local businesses/employers to develop and implement a plan for City-supported accelerated fleet electrification. As part of the plan, identify opportunities for accelerated fleet electrification and promote zero-emission vehicle (ZEV) adoption within major private and employee fleets in the city. Key Pillar: Engagement Timing: Phase 2 Cost: Low-Medium
TR 3.8	Support zero-emission vehicle (ZEV) car share companies in coming to Cupertino; collaborate with neighboring jurisdictions and the County to do the same to create a larger connected network of ZEV car share. Key Pillar: Partnerships Timing: Phase 2 Cost: Low

TR 3.9	Establish affordable, zero-emission vehicle (ZEV) car share to serve affordable housing and/or multifamily developments with a priority to target renters, residents in multi-unit housing, low-income and fixed income people, historically underserved communities, elders, and individuals with access needs. Key Pillar: Equity City Partners: ZEV car share vendors Timing: Phase 2 Cost: Low
TR 3.10	Review zero-emission vehicle (ZEV) adoption rates based on demographics of Cupertino to identify ways to improve ZEV adoption among renters, low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs. Based on the results, conduct targeted outreach to groups to identify barriers and concerns of potential ZEV drivers. Work with community-based organizations to target outreach and program planning to reduce barriers for ZEV adoption among groups with low participation rates. Key Pillar: Engagement City Partners: Community based organizations Timing: Phase 1 Cost: Low
TR 3.11	Coordinate with community-based organizations, agencies, and non-profits to conduct zero-emission vehicle (ZEV) education events for renters, low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs that would include information on costs/benefits of owning ZEVs, steps on how to receive incentives for ZEVs, and other benefits. Key Pillar: Equity Timing: Phase 2 Cost: Low

TR 3.12	Work with SVCE and PG&E to incentivize electric vehicle charger installations through on-bill financing and other alternative financing. Key Pillar: Funding Timing: Phase 3 Cost: Low
TR 3.13	Identify and implement incentives and technical assistance for commercial fleet electrification. This could include local tax breaks, fee waivers, or incentives. Key Pillar: Funding Timing: Phase 3 Cost: Medium

Measure TR-4: Re-focus transportation infrastructure away from single-occupancy gasoline vehicles to support the bicycle/pedestrian, public transit, and ZEV goals of Measures TR-1, TR-2, and TR-3

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure TR-4 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Cost Savings

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure TR-4 are included in Table 17.

Table 17 Measure TR-4 Actions

Action ID	Action Description
TR 4.1	Conduct public outreach and analysis of the potential community impacts and benefits of implementing disincentive-based policies for driving gasoline and diesel single passenger vehicles. Explore topics such as limiting parking options, increased local taxes (income tax, gasoline tax, or car registration tax), and transportation network company (TNC) user taxes. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
TR 4.2	In addition to general public outreach, conduct targeted outreach to students, low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs during analysis of the disincentive-based transportation policies to understand the community's potential concerns. Key Pillar: Engagement Timing: Phase 1 Cost: Low
TR 4.3	Define equity metrics for implementation of disincentives based on feedback from local students, low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs and structure the disincentive programs to meet these metrics. Key Pillar: Equity Timing: Phase 2 Cost: Low

TR 4.4	Develop a plan and timeline for allowing developers to build housing without off-street parking if the location is close to frequent transit service, to be implemented at a time when frequent transit options are more available in Cupertino. Key Pillar: Structural Change Timing: Phase 2 Cost: Low
TR 4.5	As part of future updates to the General Plan, conduct a traffic pattern study to identify commercial areas of the City to severely limit or eliminate parking for single-passenger gasoline and diesel vehicles. Key Pillar: Studies & Plans Timing: Phase 2 Cost: Medium
TR 4.6	Conduct a study of citywide parking minimums and based on available transportation options, travel demand, and land use, consider parking maximums and potentially charging for public parking spaces. Key Pillar: Studies & Plans Timing: Phase 2 Cost: Low
TR 4.7	Identify options for funding active and public transit programs through a local tax, such as an income tax, local gasoline tax, or gasoline/car registration tax. Ensure any tax or fee is designed to have low to no impact on low-income residents (e.g., includes a rebate for CARE/FERA customers, or has progressive fee levels based on income bracket/value of the car). Key Pillar: Funding Timing: Phase 1 Cost: Low

TR 4.8	Implement a user tax on Transportation Network Companies (TNC), taxi companies, and other private transportation services, which would put a small fee on the use of these services to generate funds to pay for transit and mobility infrastructure. Exceptions to a user tax may be made for private transportation services that can demonstrate they reduce VMT. Key Pillar: Funding Timing: Phase 2 Cost: Low-Medium
TR 4.9	Track the results of the CAP's driving disincentive programs - parking limitations, increased local taxes (income tax, gasoline tax, or car registration tax), and TNC user taxes - and share these results with neighboring jurisdictions and the County to collaborate on extending these programs within the County. Key Pillar: Partnerships Timing: Phase 3 Cost: Low

Measure TR-5: Electrify or otherwise decarbonize 34 percent of off-road equipment by 2030 and 35 percent by 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure TR-5 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Cost Savings

GHG Emissions Reductions

- 2030: 0.098 MT CO_2e/person
- 2040: 0.102 MT CO_2e/person

Actions to support Measure TR-5 are included in Table 18.

Table 18 Measure TR-5 Actions

Action ID	Action Description
TR 5.1	Investigate commercial off-road equipment fleets in Cupertino and identify fleets with highest decarbonization potential. Key Pillar: Studies & Plans Timing: Phase 1-2 Cost: Low
TR 5.2	Work with BAAQMD to expand rebate and incentive programs for upgrading off-road equipment and switching to biofuels or electric equipment. Key Pillar: Funding City Partner: BAAQMD Timing: Phase 2 Cost: Medium
TR 5.3	Partner with SVCE and the County of Santa Clara to incentivize electrification of landscaping equipment and other off-road equipment types such as construction machinery. Key Pillar: Partnerships City Partners: SVCE, Santa Clara County Timing: Phase 2 Cost: Low
TR 5.4	By 2025, develop an ordinance to ban local operation of gasoline and diesel-powered off-road equipment by 2030 to improve public health, reduce noise, and reduce local GHG emissions. This ordinance can build upon the noise ordinance which regulates landscaping equipment. Include allowance for biofuels (i.e., renewable diesel) for equipment for which zero emission alternatives are not available in the ordinance. Key Pillar: Structural Change City Partners: BAAQMD Timing: Phase 2 Cost: Low-Medium

10 Getting to Zero Waste

10.1 Context

Cupertino defines zero waste as an ongoing set of practices to conserve resources and protect humans and the environment by responsibly producing, consuming, reusing, and recovering food and goods.

Solid waste accounts for only five percent of the emissions in Cupertino's greenhouse gas inventory but striving toward zero waste can create climate benefits beyond Cupertino's borders and the measures in this section support Cupertino's overall goal of working toward zero waste of resources.

The City has an overall goal of reaching and maintaining 80 percent waste diversion by 2025. The diversion rate is calculated using CalRecycle's Diversion rate equivalent formula (Cupertino's waste diversion rate as of 2018 is 73 percent). Working toward zero waste requires two main strategies. First, maximizing waste diversion (including recycling and composting) and second, minimizing waste generation.

Cupertino's zero waste (W) measures align with these strategies. They are:

- **Measure W-**1: Implement SB 1383 requirements and reduce communitywide landfilled organics 75% by 2025 and inorganic landfilled waste 35% by 2030. Reduce all landfilled waste 90% by 2040.
- **Measure W-2:** Reduce overall waste disposed to garbage, recycling, and compost per capita by 15% by 2035.
- **Measure W-**3: Meet or exceed the SB 1383 recycled organics products procurement requirements and sequester or avoid at least 0.018 MT CO2e per person by 2045

Less Waste to Landfill

Reducing the amount of organic waste (such as food waste and yard waste) sent to landfills will help the City achieve its climate goals because methane released from landfilled organic waste is the main local source of waste-related greenhouse gas emissions. Actions for reducing organic waste to the landfill are already clearly defined by State requirements under SB 1383, which lay out specific programs, policies, and objectives for the City to support the State goal. Under SB 1383, cities are required to rescue edible food, divert organic waste from landfill, and procure compost and/or other materials from recycled organic waste. Those requirements are already captured in Cupertino ordinance 21-2231.

Going beyond organics, Cupertino aims to reduce inorganic waste (such as plastic, paper, and metal) going to landfill and the total amount of all waste going to landfill.

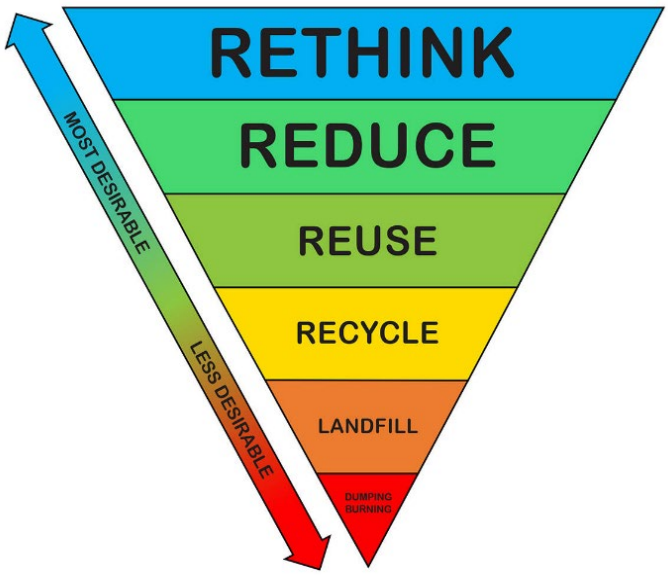
Waste Prevention

The best way to manage waste is to prevent it in the first place. This is because creating items and disposing of them as waste requires raw materials, time, energy, and other resources, which can all be conserved when waste is prevented. In addition, not all waste is reusable or recyclable, so the best way to keep it out of landfill as technologies develop is prevention. Figure 7 illustrates these concepts.

The GHG emissions emitted from creating and transporting goods before they reach consumers are called lifecycle emissions. These emissions are typically higher than any emissions released locally in Cupertino when waste is disposed. Recycling and recovering waste are helpful to keep waste out of landfills, but these are the last opportunities to manage waste, not the first, because they do not address lifecycle emissions and the other costs of creating materials.

To make progress towards zero waste and reduce GHG emissions as much as possible, Cupertino will study the lifecycle emissions of goods and services and prioritize waste prevention so that waste can be eliminated at the source before management and disposal are necessary. Although actions that address inorganic waste will have a minimal impact toward meeting Cupertino's communitywide GHG emissions reduction goals, reducing inorganic waste reduces the need for production and disposal of these materials. This will reduce the associated lifecycle emissions of that waste outside of Cupertino.

Figure 7. Zero Waste Management Heirarchy



10.2 Measures and Actions Detail

Measure W-1: Implement SB 1383 requirements and reduce communitywide landfilled organics 75% by 2025 and inorganic waste 35% by 2030 and reduce all waste 90% by 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure W-1a are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- 2030: 0.202 MT CO_2e/person
- 2040: 0.200 MT CO_2e/person

Actions to support Measure W-1 are included in Table 19.

Table 19 Measure W-1 Actions

Action ID	Action Description
W 1.1	Partner with local community organizations and businesses to implement all required activities under SB 1383. Key Pillar: Partnerships City Partners: Recology, County of Santa Clara, food generating businesses, food recovery organizations Timing: Phase 1 Cost: Low
W 1.2	Route collected landfilled waste through a materials recovery facility (MRF) to increase diversion before final disposal. Continue financial support for low-income residents to offset the increase in trash collection rates. Key Pillar: Structural Change Timing: Phase 2 Cost: Medium
W 1.3	Work with contracted hauler to develop and implement a comprehensive monitoring and quality control program with a focus on consumer behavior change. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
W 1.4	Encourage businesses to educate their employees about organic waste diversion and proper sorting annually by providing training resources and rebate program to fund employee time for training. Key Pillar: Engagement City Partners: Local businesses Timing: Phase 1 Cost: Low

W 1.5	Establish relationships with multi-family (MF) property owners/managers to develop signage for their properties to encourage food waste diversion. Go door-to-door at each MF unit yearly to provide supplies and education for proper sorting. Key Pillar: Engagement City Partners: Multi-family property owners and managers Timing: Phase 1 Cost: Low
W 1.6	Conduct targeted, multi-lingual, culturally appropriate, and geographically diverse waste diversion educational and technical assistance campaigns based on outcomes of the waste characterization study, and comprehensive monitoring and quality control program. Topics could include proper sorting, reduce smell/mess, where does the material go after it leaves the curb, methane from food waste in landfill. Key Pillar: Equity Timing: Phase 1 Cost: Low
W 1.7	Partner with schools, retirement communities, and other large institutions to create waste diversion and prevention programs/procedures/plans. Key Pillar: Partnerships City Partners: Schools, retirement communities, hospitals, hotels, large venues Timing: Phase 1 Cost: Low
W 1.8	Work with waste hauler to determine data necessary to meet zero waste goals and establish protocol for regular collection and reporting of associated metrics. Key Pillar: Partnerships Timing: Phase 2 Cost: Low

W 1.9	Implement enforcement and fee for incorrectly sorted materials with sensitivity to shared collection to reduce contamination. Key Pillar: Structural Change Timing: Phase 1-2 Cost: Low
W 1.10	Conduct Construction & Demolition (C&D) feasibility study to determine if the City can expand C&D waste diversion requirements and, if feasible, create a deconstruction ordinance to require reuse of materials. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
W 1.11	Conduct waste characterization studies (WCS) every 4-5 years to inform programs and policies. Leverage the waste characterization data to understand the waste stream and modify plans to increase diversion and decrease contamination. Key Pillar: Studies & Plans Timing: Phase 1-3 Cost: Medium
W 1.12	Understand alternatives to three waste streams disposal and fill in waste generation gaps by collecting data from take-back locations (grocery stores, auto shops, carpets, mattresses, battery collection, etc.). Key Pillar: Studies & Plans Timing: Phase 2 Cost: Low

W 1.13	Increase access to recycling facilities such as beverage container California Refund Value (CRV) redemption and extended producer responsibility (EPR) take-back programs. Key Pillar: Structural Change Timing: Phase 2 Cost: Low
W 1.14	Monitor and report recycling activity, including the number of materials recycled, programmatic achievements, and the strength of commodity markets. Produce reports to the City Council as needed to inform future zero waste planning. Key Pillar: Studies & Plans Timing: Phase 1-3 Cost: Low
W 1.15	Add extra bulky-item pickup service for low- and medium-income residents at a subsidized cost to help minimize illegal dumping and increase access to bulky item disposal. Key Pillar: Equity Timing: Phase 2 Cost: Medium
W 1.16	Conduct a study about textiles recycling opportunities that can be rolled out across Cupertino. Key Pillar: Studies & Plans Timing: Phase 2 Cost: Low

Measure W-2: Reduce overall waste disposed to garbage, recycling, and compost per capita by 15% percent by 2035

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure W-2 are as follows:

Co-Benefits

- Jobs Creation
- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Affordable Housing & Local Development
- Cost Savings

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure W-2 are included in Table 20.

Table 20 Measure W-2 Actions

Action ID	Action Description
W 2.1	Conduct a consumption-based GHG emissions inventory to understand the community's worst consumption habits and emission reduction potential and provide educational materials on a closed-loop circular economy. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low
W 2.2	Based on results of the consumption-based emissions inventory, create a plan to achieve the objective of zero growth of waste generation. Consider reusable diaper service, promoting plant-based diets, etc. Key Pillar: Studies & Plans Timing: Phase 2-3 Cost: Medium
W 2.3	Consider creation of upcycle/resell shop to increase access to items for reuse and create jobs. Key Pillar: Structural Change Timing: Phase 2-3 Cost: Medium
W 2.4	Conduct targeted, multi-lingual, culturally appropriate, and geographically diverse waste prevention educational and technical assistance campaigns based on outcomes of WCS. Outreach topics can include food waste prevention, edible food recovery strategies, proper storage, how to fix clothes/electronics, how to donate, reusable alternatives, effects of overconsumption, sustainable consumption habits, buying second hand, buying durable, sharing, repurposing. Key Pillar: Equity Timing: Phase 1 Cost: Low

W 2.5	Create a training/education program that is free and accessible to all residents and employees to learn about waste prevention and diversion strategies and effects of overconsumption. Key Pillar: Engagement Timing: Phase 1 Cost: Low
W 2.6	Expand edible food recovery program to all restaurants and food generating businesses and create incentives for small businesses who otherwise couldn't participate. Key Pillar: Equity Timing: Phase 1 Cost: Medium
W 2.7	Fund edible food recovery organizations so they can expand and handle increased volume. Leverage CalRecycle support for projects that prevent food waste or rescue edible food. Key Pillar: Funding City Partners: Food recovery organizations and small businesses Timing: Phase 2 Cost: Medium
W 2.8	Work with the business community to design and promote extended producer responsibility such as take-back programs. Key Pillar: Partnerships Timing: Phase 2 Cost: Low

W 2.9	Consider a fee at point of use for single-use foodware by food service providers. Fee would be waived for individuals who are dependent on these products for health reasons. Key Pillar: Funding City Partners: Restaurants and other food businesses Timing: Phase 2 Cost: Low
W 2.10	Partner with local organizations, schools, and libraries to establish pop-up repair café for commonly broken and easily repaired items. Key Pillar: Partnerships City Partners: Local schools and libraries Timing: Phase 1 Cost: Low
W 2.11	Increase bans on "problem materials." Ban items without means of recycling or recycling markets, such as sale of polystyrene, produce bags, plastic packaging, straws, plastics #4-7, and/or mixed materials. Key Pillar: Structural Change Timing: Phase 2 Cost: Low-Medium
W 2.12	Create a requirement for large events to use an event waste management service. This could be included as a condition before the City issues a special event permit. Key Pillar: Structural Change City Partners: Large events and venues Timing: Phase 2 Cost: Low-Medium

Measure W-3: Meet or exceed the SB 1383 recycled organics products procurement requirements and sequester or avoid at least 0.018 MT CO_2e per person by 2045

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure W-3are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Jobs Creation

GHG Emissions Reductions

- 2030: 0.018 MT CO_2e/person
- 2040: 0.018 MT CO_2e/person

Actions to support Measure W-3 are included in Table 21.

Table 21 Measure W-3 Actions

Action ID	Action Description
W 3.1	Develop partnerships with local community organizations and businesses to implement all required recycled organics products procurement activities under SB 1383. Key Pillar: Partnerships City Partners: Recology, County of Santa Clara, food recovery organizations Timing: Phase 1 Cost: Medium

11 Working with Nature

11.1 Context

A carbon neutral future includes leveraging the greenspace and water systems within the City to reduce GHG emissions. For example, greenspace – like trees and planted landscapes – can be expanded and maintained to remove carbon from the atmosphere through natural biological processes called carbon sequestration, helping to reduce GHG emissions in the City. Water and wastewater infrastructure can be managed to reduce the energy needed to transport water, and associated GHG emissions. Residential and commercial uses for cooking and cleaning can also be managed or upgraded to be less water intensive. Managing water systems in this way has the added benefit of putting less pressure on water resources across California during times of drought and ensuring more long-term resilience of this vital resource.

The Public Works Department is responsible for the planting and maintenance of approximately 20,500 trees. Visit our YouTube channel to hear more from the City arborists:

https://youtu.be/X5l8YnV3f4A

Carbon Sequestration

To achieve carbon neutrality in 2040, the City of Cupertino will reduce GHG emissions across all sectors to achieve as close to zero GHG emissions as possible. However, due to limitations in technology and the length of time that it takes to normalize new low-carbon behaviors, it is expected that some GHG emissions will remain under the City's jurisdiction in 2040. A carbon-neutral future therefore includes carbon sequestration mechanisms, which take carbon out of the atmosphere, to offset remaining GHG emissions. Strategies available for carbon sequestration include planting trees, managing greenspace effectively, composting, and removing carbon from the atmosphere. The CAP's carbon sequestration (**CS**) measures align with these strategies and consist of the following:

- **Measure CS-1**: Increase carbon sequestration through tree planting by developing and implementing an Urban Forest Management Plan
- **Measure CS-2:** Leverage the carbon sequestration potential of open space and carbon removal

Water and Wastewater

While only a small part of the City's GHG emissions, water conservation and decarbonized wastewater treatment are important aspects of a community's overall sustainability and resiliency. To this end, the CAP Update's water and wastewater (**WW**) measures consist of the following measures:

- **Measure WW-1**: Reduce per capita water consumption by 15 percent compared to 2019 levels by 2030 and maintain through 2040
- **Measure WW-2**: Support the SJ-SC RWF in implementing GHG emissions reduction projects

11.2 Measures and Actions Detail

Measure CS-1: Increase carbon sequestration through tree planting by developing and implementing an Urban Forest Management Plan

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure CS-1 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- These are supporting actions

Actions to support Measure CS-1 are included in Table 22.

Table 22 Measure CS-1 Actions

Action ID	Action Description
CS 1.1	Identify and partner with local community-based organizations with connections to low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs to assist in development of an Urban Forest Management Plan (UFMP) to ensure equity is prioritized as part of the plan. Key Pillar: Equity Timing: Phase 1 Cost: Low
CS 1.2	Conduct an urban heat island study to assist in identifying priority areas in Cupertino for planting new trees. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium
CS 1.3	Develop an Urban Forest Management Plan (UFMP) based on the City's tree canopy assessment that identifies the framework and strategy for expanding the tree canopy in Cupertino. As part of the UFMP development effort, identify a tree canopy expansion goal. Ensure the sustainability of the urban forest (including all existing and new trees) by including in the UFMP plans for continued tree maintenance and protection, attention to safety, resident engagement, and the planting of native and climate-appropriate trees. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium

CS 1.4	Review the Tree Protection Ordinance and ensure that trees are protected with future updates to the General Plan. Ensure any trees that may be removed to accommodate new housing are replaced with at least a 2:1 ratio. Key Pillar: Structural Change Timing: Phase 2 Cost: Low-Medium
CS 1.5	Establish a program for obtaining grant funding for development of UFMP and tree planting. Key Pillar: Funding Timing: Phase 2 Cost: Medium

Measure CS-2: Leverage the carbon sequestration potential of open space and carbon removal

A previous tree canopy study identified that 27% of Cupertino's land area is potentially suitable for more tree plantings. This potential can and should be considered for increasing Cupertino's local natural carbon sequestration through tree planting. Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure CS-2 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure CS-2 are included in Table 23.

Table 23 Measure CS-2 Actions

Action ID	Action Description
CS 2.1	Study opportunities to create new natural areas in existing open spaces, parklands, and fields with native species, biodiverse ecology, higher carbon sequestration potential and ecologically responsible recreation opportunities for the community. Key Pillar: Studies & Plans Timing: Phase 1 Cost: Low-Medium
CS 2.2	Expand community gardens program beyond McClellan Ranch Preserve. Continue to prioritize locating new gardens in high-density housing areas. Program goals include promoting healthy living through access to healthy food, creating a secure place where residents can strengthen community bonds, and providing education on safe organic gardening practices. Key Pillar: Equity Timing: Phase 2 Cost: High
CS 2.3	Study options to invest in carbon drawdown removal in a way that is appropriate for Cupertino. The study should include a review of the Oxford Carbon Drawdown Principles and identify if there exist any investments within or outside of Cupertino that make sense to contribute to carbon drawdown. Key Pillar: Studies & Plans Timing: Phase 2 Cost: Low-Medium
CS 2.4	Develop an embodied carbon emissions policy and ordinance that encourages or requires carbon to be sequestered in building materials such as mass timber framing or low-carbon concrete. Key Pillar: Structural Change Timing: Phase 3 Cost: Low-Medium

Measure WW-1: Reduce per capita water consumption by 15 percent compared to 2019 levels by 2030 and maintain through 2040

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure WW-1 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Cost Savings

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure WW-1 are included in Table 24.

Table 24 Measure WW-1 Actions

Action ID	Action Description
WW 1.1	Adopt an ordinance for installation of dual-plumbing water systems that utilize greywater for irrigation at new residential construction, including ADUs, and in major retrofits. In doing so the City will: 1. Engage with builders and developers to provide information on the new requirements for residential new construction 2. Develop and adopt an ordinance based on the available model ordinances Key Pillar: Structural Change City Partners: Valley Water and regional working groups Timing: Phase 2 Cost: Low-Medium
WW 1.2	Work with Santa Clara Valley Water to develop an enhanced public engagement campaign that promotes water efficiency rebates from Santa Clara Valley Water (Greywater, Laundry to Landscape program), including educating residents on the benefits of dual-plumbing greywater systems, low-flow fixtures, and their connection to climate resilience and GHG emissions reductions. Ensure that all outreach and education is in multiple languages. Key Pillar: Engagement Timing: Phase 2 Cost: Low
WW 1.3	Perform targeted outreach to households with low-income and fixed income people, historically underserved communities, elders, and disabled individuals with access needs to provide free water conservation devices through the Santa Clara Valley Water. Ensure that all outreach and education is in multiple languages. Key Pillar: Equity Timing: Phase 2-3 Cost: Low
WW 1.4	Work with schools to educate youth about water conversation. Key Pillar: Engagement City Partners: Local school districts Timing: Phase 2 Cost: Low

WW 1.5	Continue to provide rebates or other funding to low- and medium-income homes for installing laundry to landscape systems, rainwater catchment systems, and low-flow appliances. Key Pillar: Funding Timing: Phase 1 Cost: Medium
WW 1.6	Work with Santa Clara Valley Water and Cupertino's water retailers to provide Wi-Fi connected meters that citizens can check on phones and computers. Key Pillar: Partnerships City Partners: Water retailers, Valley Water Timing: Phase 3 Cost: Medium
WW 1.7	Partner with Santa Clara Valley Water to support a brackish water/desalinization program, as feasible. Key Pillar: Partnerships City Partners: Valley Water Timing: Phase 3 Cost: Medium
WW 1.8	Expand the Climate Victory Gardens pilot to an ongoing program and work with Santa Clara Valley Water to expand to a regional service. Key Pillar: Partnerships Timing: Phase 1 Cost: Medium

Measure WW-2: Support the SJ-SC Regional Wastewater Facility in implementing GHG emissions reduction projects

Co-benefits and specific quantitative GHG emissions reductions associated with implementation of Measure WW-2 are as follows:

Co-Benefits

- Enhanced Public Health & Safety
- Climate Change Resilience
- Biodiversity & Ecosystem Services
- Jobs Creation
- Cost Savings

GHG Emissions Reductions

- Supportive Measure & Actions

Actions to support Measure WW-2 are included in Table 25.

Table 25 Measure WW-2 Actions

Action ID	Action Description
WW 2.1	Establish a program or function for supporting SJ-SC Regional Wastewater Facility in obtaining grant funding for methane capture or other GHG reduction infrastructure. Explore opportunities related to methane capture and conversion to biofuel through the state's Low Carbon Fuel Standard (LCFS) program. Key Pillar: Funding Timing: Phase 1 Cost: Low-Medium
WW 2.2	Collaborate with the cities of San Jose, Santa Clara, Campbell, Los Gatos, Monte Sereno, and Saratoga, and the County to advocate and support GHG reductions at the SJ-SC RWF. Explore opportunities to scale beyond regional coordination. Key Pillar: Partnerships City Partners: Santa Clara County and neighboring cities Timing: Phase 2 Cost: Low

12 Adaptation and Resilience

12.1 Context

Climate change impacts are already happening in Cupertino, and they are projected to intensify. More detail is available in Section 2.2: Climate Change Impacts. To protect people, assets, and natural systems, the City is engaging in climate adaptation. Climate adaptation is adjusting to respond to actual or expected climate impacts, with the goal of mitigating harms or taking advantage of opportunities.[47] An essential part of adaptation is building resilience, which is the capacity to "prepare for disruptions, recover from shocks and stresses, and adapt to and grow from a disruptive experience."[48]

Adaptation includes identifying and planning for climate risks, undertaking projects that increase resilience and the community's ability to adapt, and establishing relationships for regional coordination and information sharing. The City conducted a vulnerability assessment to understand how climate change may affect Cupertino and will use the results to inform adaptation planning.[49]

Vulnerability Assessment Findings

The vulnerability assessment compares the potential impacts of climate hazards to Cupertino's adaptive capacity. Potential impacts are modeled based on a mid-century, moderate emissions scenario known as scenario 4.5. Scenario 4.5 assumes global emissions peak in the years circa 2040-2050, which the City believes is feasible given the current state of global climate pledges.[50] Several different emissions scenarios are illustrated in Figure 8, below.

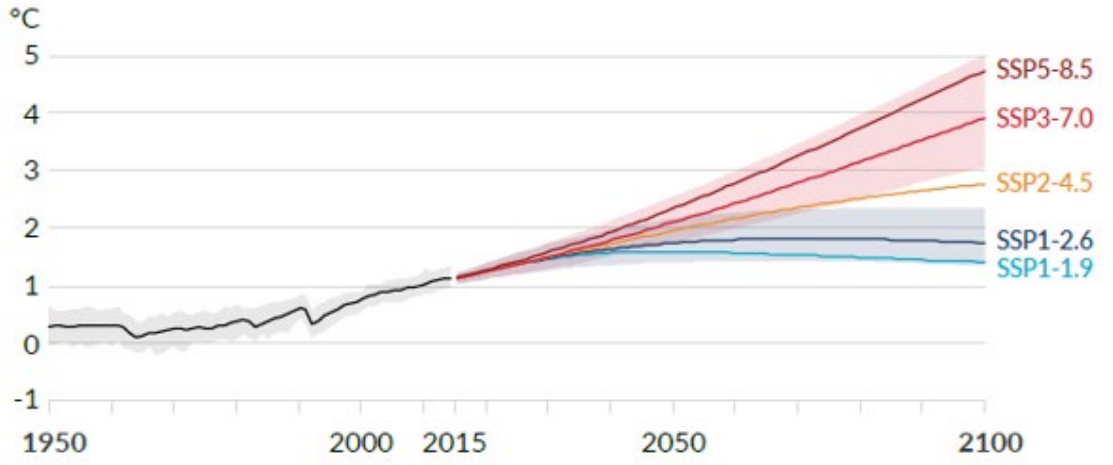
[47] Adapted from the California Governor's Office of Emergency Services. June 2020. California Adaptation Planning Guide. Available: https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf#search=adaptation%20planning%20guide Accessed September 2021.

[48] Ibid. Pg. 12.

[49] The full vulnerability assessment will be released as a companion document.

[50] Meinshausen, M., Lewis, J., McGlade, C. *et al.* Realization of Paris Agreement pledges may limit warming just below 2 °C. *Nature* **604**, 304–309 (2022). Available: https://doi.org/10.1038/s41586-022-04553-z Accessed April 15, 2022.

Figure 8. Global Surface Temperature Change Relative to 1850-1900 in Five Different Emissions Scenarios

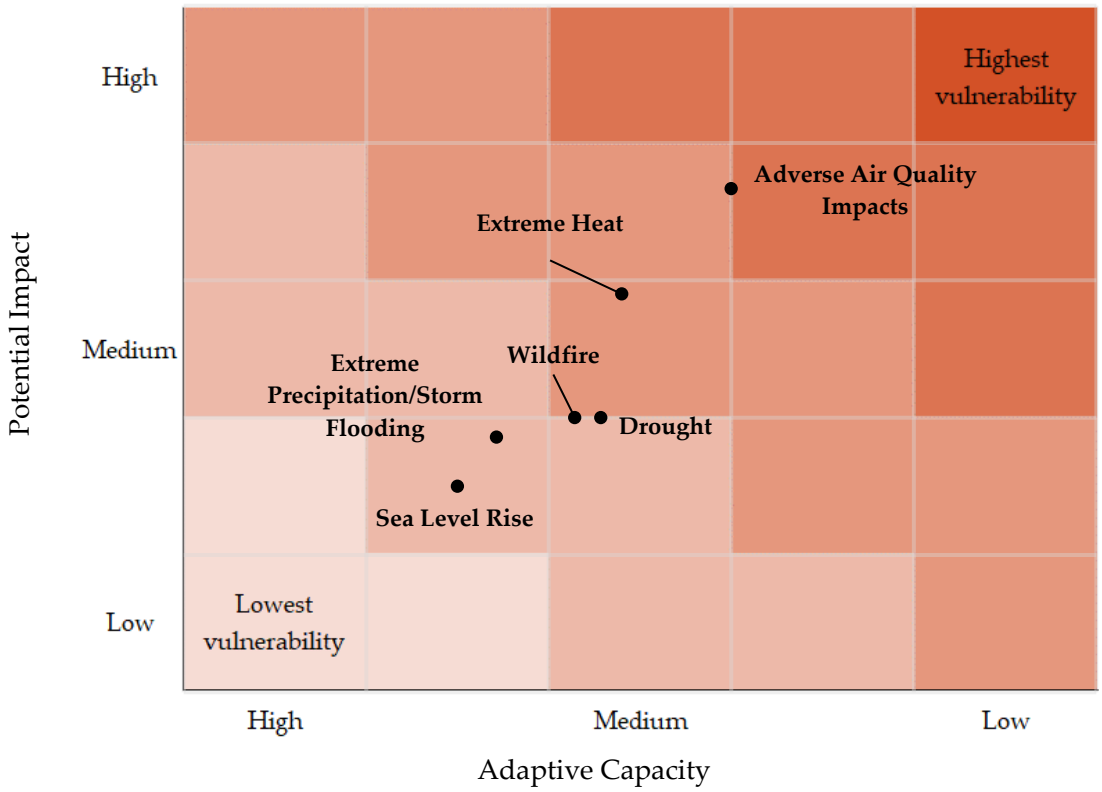


Source: IPCC (2021) Figure SPM.8a

Adaptive capacity describes strengths, existing systems and processes, and other resources that can allow the City to mitigate harms and take advantage of opportunities for co-benefits.

Using the two factors of modeled impact and adaptive capacity, the CAP 2.0 project team scored Cupertino's vulnerability across six climate hazards. Vulnerability is highest for hazards that have high potential impacts and for which the city has low adaptive capacity. Cupertino is most vulnerable to adverse air quality impacts and extreme heat, and the city has medium vulnerability to drought, wildfire, and extreme precipitation/storm flooding. Cupertino is least vulnerable to sea level rise. The results are summarized below in Figure 9.

Figure 9. Climate Hazards Vulnerability Assessment



Cupertino has the lowest adaptive capacity for adverse air quality impacts and extreme heat. Many of these impacts, especially the health impacts, are subtle and diffuse. While the City and County do offer cooling centers and other resources, the City can also build capacity by strengthening communication and education, as well as engaging communities with resources such as resilience hubs.

Brownouts are a significant concern during extreme heat events, and energy resilience remains a priority. There is greater adaptive capacity for drought, wildfires, and extreme precipitation/storm flooding through regional coordination and partnerships. Sea level rise remains of lowest concern because Cupertino will not be directly affected.

Recommendations

The City has identified the following recommendations to strengthen climate adaptation:

- Strengthen air quality and extreme heat response
- Expand urban greening and natural infrastructure
- Increase energy resilience
- Strengthen community capacity and resilience

- Increase community engagement with and investment in vulnerable communities
- Coordinate with regional partners

Many of these strategies are addressed in the following adaptation and resiliency (**AR**) measures below or are already addressed in other measures.

12.2 Adaptation Measures and Actions

Measure AR-1: Increase usage of natural infrastructure solutions such as bioswales, rainwater storage systems, and permeable pavements to enhance infrastructure resiliency.

Healthy natural systems provide services such as decreased flood risk, air pollution filtration, and lower ambient temperatures, thereby increasing resilience across multiple climate hazards. Measures CS-1 and CS-2 already include actions to expand and maintain natural infrastructure such as the city's urban forest and open space. Thus, this measure will focus on expanding green stormwater infrastructure throughout the city.

Benefits

- Decreased flood risk
- Lower ambient temperatures
- Greater resilience to drought
- Enhanced public health and safety

Table 26 Measure AR-1 Actions

Action ID	Action Description
AR 1.1	Prioritize opportunities to focus green stormwater infrastructure improvements in vulnerable communities and the areas of most need including areas with a large proportion of renters, low-income areas, and in historically underserved communities. Key Pillar: Equity Timing: Phase 1 Cost: Low-Medium
AR 1.2	Develop one or more demonstration projects which can be used to educate the community about natural infrastructure solutions. Key Pillar: Engagement Timing: Phase 2 Cost: Medium

Measure AR-2: Bolster emergency preparedness and response by integrating climate adaptation and improving climate-related communications.

The potential public health impacts from climate change may be significant. Integrating climate change projections into emergency preparedness and response will allow the City to better protect its communities. This is especially important for hazards such as poor air quality and extreme heat, for which Cupertino has lower adaptive capacity. The following actions describe opportunities to bolster the City's emergency preparedness and response.

Benefits

- Enhanced public health and safety
- Greater resilience to climate hazards, especially poor air quality
- Increased community capacity and resilience

Actions to support Measure AR-2 are included in Table 27.

Table 27 Measure AR-2 Actions

Action ID	Action Description
AR 2.1	By 2023, create Key Performance Indicators (KPIs) to track pollutants from local air quality monitoring data and incorporate regular reporting of air quality KPIs into CAP reports and live interactive public dashboards. Key Pillar: Engagement Timing: Phase 1 Cost: Low-Medium
AR 2.2	Provide wildfire smoke guidance and protocols for municipal employees to ensure their safety when air quality is poor. Key Pillar: Engagement Timing: Phase 1 Cost: Low
AR 2.3	Integrate the vulnerability assessment results into emergency preparedness, management, response, and early warning systems. Key Pillar: Structural Change Timing: Phase 2 Cost: Low
AR 2.4	Partner with the County of Santa Clara Vector Control District and Public Health Department to develop and enhance disaster and emergency early warning systems that incorporate objective data and information for potential health threats such as heat-illness, illnesses complicated by adverse air quality, and inundation and precipitation events. Key Pillar: Partnerships Timing: Phase 2 Cost: Low-Medium
AR 2.5	Develop new educational materials that cover each climate hazard identified in the vulnerability assessment. Provide these materials in at least three different languages and several formats for the widest audience. Key Pillar: Engagement Timing: Phase 1 Cost: Low

Measure AR-3: Strengthen Community Capacity and Resilience through Education, Resources, and Policies

Strong communities have greater resilience and disaster recovery.[51] Social relationships can provide community members with emotional support, empower them to prepare for disasters, spread essential information, and promote problem-solving.[52] Strong communities care for each other and can supplement government response during an emergency.[53] By building community capacity, communities are empowered to learn about and adapt to climate hazards to protect their families and each other.

Benefits

- Increased community capacity and resilience
- Enhanced public health and safety
- Greater resilience to climate hazards
- Stronger social relationships and civic engagement

[51] Ivan Townshend, Olu Awosoga, Judith Kulig, and HaiYan Fan. Natural Hazards. November 2014. Social cohesion and resilience across communities that have experienced a disaster. Available: https://www.researchgate.net/publication/268743797_Social_cohesion_and_resilience_across_communities_that_have_experienced_a_disaster

[52] Tim Prior and Christine Eriksen. Global Environmental Change. 2013. Wildfire preparedness, community cohesion and social-ecological systems. Available: https://ro.uow.edu.au/sspapers/616/?utm_source=ro.uow.edu.au%2Fsspapers%2F616&utm_medium=PDF&utm_campaign=PDFCoverPages

[53] Kelly Bergstrand and Brian Mayer. Society & Natural Resources. 2020. "The Community Helped Me:" Community Cohesion and Environmental Concerns in Personal Assessments of Post-Disaster Recovery, Society & Natural Resources. Available: https://rc.library.uta.edu/uta-ir/bitstream/handle/10106/29585/The%20Community%20Helped%20Me%20Community%20Cohesion%20and%20Environmental%20Concerns%20in%20Personal%20Assessments%20of%20Post%20Disaster%20Recovery_postprint.pdf?sequence=1&isAllowed=y.

Table 28 Measure AR-3 Actions

Action ID	Action Description
AR 3.1	Educate communities about the health risks of climate hazards and engage them in strengthening community resilience such as block-level climate resilience training and resilience hubs. Key Pillar: Engagement Timing: Phase 2 Cost: Low-Medium
AR 3.2	Enroll 400 households by the end of Phase 2 to participate in a climate resiliency block training program. The curriculum will include household preparedness planning as well as basic education on climate hazard awareness. Key Pillar: Engagement Timing: Phase 1-2 Cost: Low-Medium
AR 3.3	Bring policies for the City Council to consider that would achieve Gold ratings in all categories set forth by the County of Santa Clara Healthy Cities Index. Key Pillar: Structural Change Timing: Phase 2 Cost: Low

Measure AR-4: Update the Adaptation Strategy and Action Plan in Coordination with the County of Santa Clara.

Climate science and projections change over time as scientific techniques improve, more information becomes available, and factors such as population growth and development change. More research and novel adaptation practices may also emerge. To use the most up-to-date information and best adaptation practices, the City plans to update this adaptation strategy in partnership with the County of Santa Clara. This will allow the City to take advantage of synergies with County adaptation plan which is under development, as well as access county-level projections and other information.

Table 29 Measure AR-4 Actions

Action ID	Action Description
AR 4.1	Update this adaptation strategy in coordination with the County of Santa Clara. Cascade recommendations from the climate vulnerability assessment into the Cupertino General Plan – Safety Element as required by State Bill (SB) 379. Key Pillar: Structural Change Timing: Phase 1 Cost: Low-Medium

13 Implementation

13.1 Monitoring, Tracking, and Reporting

This Climate Action Plan outlines the steps that Cupertino will take to achieve the Cupertino 2030 climate target and to make progress towards the goal of attaining and maintaining carbon neutrality by 2040 and beyond. The underlying assumptions and data informing this plan including adoption rates of measures and actions, the emergence of new or improved technologies, changes in costs of technology, legislative changes, and co-benefits will continue to change and evolve over time. Therefore, this CAP should be viewed as a strategic framework that will be re-evaluated on a regular basis.

The City remains committed to the sustained, iterative, and inclusive effort required to achieve the long-term climate targets outlined in this CAP. The City will continue to engage the community, provide informative progress updates, and create ongoing opportunities to solicit and incorporate community feedback as policies and programs are developed and infrastructure is constructed. The City will report publicly on its progress towards its high-impact mitigation and adaptation measures no less than every two years via CDP-ICLEI Unified Reporting System or similar reporting platform.

Monitoring and evaluation of Cupertino's progress will be an essential part of ongoing communitywide GHG reduction efforts. The City will conduct communitywide GHG emissions inventories on a routine basis in alignment with GHG standard protocols and climate commitments,[54] but no less than every three years. If the City's 2025 GHG emissions reductions are on track to reach the 2030 Conclusion targets, it is anticipated that no additional CAP measure adjustments would be necessary. If the City has not made sufficient progress on GHG emissions reduction goals by 2025, a CAP update may be required at that time to maintain status as a CEQA-qualified GHG emissions reduction plan. Such a CAP update could require additional actions such as shifting incentive programs to mandatory requirements. If there has been sufficient progress towards meeting GHG emissions targets, the next CAP update will be completed by 2030.

[54] Global Covenant of Mayors current guidance is to conduct GHG inventory updates every two years: globalcovenantofmayors.org

13.2 Funding

Cupertino's Sustainability team has been pro-active to date in applying for and securing grant funds to support its activities. There are many sources of funding for sustainability actions from the regional, state, and federal governments. Funding requests to implement measures and actions in this plan will be brought for consideration by the City Council by in the respective budget cycle.

13.3 Looking Forward

If the City has not made sufficient progress on GHG emissions reduction goals by the next CAP review, a CAP update may be required to establish new or more robust emission reduction goals to increase emissions reductions and maintain status as a CEQA-qualified GHG emissions reduction plan. The next CAP update could require additional implementation of the existing actions and/or additional actions such as shifting incentive and educational programs to mandatory requirements. A complete CAP update for post-2030 emissions reductions targets will be required, and the City shall begin this effort by 2029.

In 2029, it is expected that the City will begin preparing an updated Climate Action Plan to revisit and update the approach outlined in CAP 2.0 and to develop new or updated measures. By the end of the decade, it is anticipated that new technologies and state mandates will be adopted that will facilitate further GHG emissions reductions, but the City will need to act to meet the long term 2040 carbon neutrality goal. The City will conduct ongoing implementation monitoring of the CAP 2.0 GHG emissions reduction and adaptation measures and report out on this progress to City Council on a regular basis beginning in 2023.

14 Conclusion

The City of Cupertino has a history of strong climate leadership. By implementing the 2015 Climate Action Plan, the City took bold action to reduce GHG emissions by 15% below 2010 levels and laid a foundation for long-term climate action. The City of Cupertino was among the first cities to declare a local climate emergency. This continuous commitment to climate protection has led to large strides towards ambitious emissions reduction goals and has enhanced the cohesivity and quality of life within the Cupertino community. The community of Cupertino can act now and over the next two decades to do its fair share in reducing GHG emissions that contribute to climate change. This CAP 2.0 provides the blueprint for continued progress towards a more resilient, prosperous, and sustainable Cupertino achieved through the collective efforts of all Cupertino community members.

15 Acknowledgements

The Climate Action Plan 2.0 was prepared by a City project team in partnership with the community. The following are specifically acknowledged for their contributions.

Members of City Council

Mayor Darcy Paul

Vice Mayor Liang Chao

Councilmember Kitty Moore

Councilmember Hung Wei

Councilmember Jon Willey

Rod Sinks (former councilmember)

Steven Scharf (former councilmember)

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Vice Chair Anna Weber

Commissioner Meera Ramanathan

Commissioner Sonali Padgaonkar

Commissioner Steve Poon

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Cupertino CERT

First Maganson Holdings, Inc

Fremont Union High School District

Kimco Realty Corp.

Recology South Bay

Rotary Club of Cupertino

St. Jude's Episcopal Church

San Jose Water

Sierra Club, Loma Prieta Chapter

Silicon Valley Youth Climate Action

StopWaste

SV Youth Climate Action

Valley Water

West Valley Community Services

Youth Environmental Power Initiative

External Partners

County of Santa Clara

Silicon Valley Clean Energy

ICLEI Local Governments for Sustainability