Appendix B

Greenhouse Gas Reduction Targets, Measures, and Prioritization Matrices

Memo

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Subject: City of Milpitas Climate Action Plan Update, Greenhouse Gas Reduction Measures – Technical Memorandum

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1 INTRODUCTION

This technical memorandum outlines greenhouse gas (GHG) reduction strategies and measures and summarizes the preliminary draft results of the quantitative "gap analysis" process for the City of Milpitas's (City's) Climate Action Plan Update (CAP Update). The purpose of the gap analysis is to confirm and quantify the suite of GHG reduction measures that would set the City on course to meet its reduction targets for 2030, 2040, and 2045 for both the community and municipal operations.

The gap analysis process considers several steps in the climate action planning process, which are listed below and addressed in subsequent sections.

1. Summary of the 2030, 2040, and 2045 GHG emissions forecasts (per "City of Milpitas Climate Action Plan Update, Greenhouse Gas Emissions Forecasts – Technical Memorandum" dated April 1, 2021);
2. Summary of the 2030, 2040, and 2045 GHG emissions reduction targets (discussed further in this technical memorandum); and
3. Quantification of GHG emissions reduction measures and evaluation of the calculated gap between the estimated GHG reductions and the recommended targets, the primary focus of this technical memorandum. This section also identifies co-benefits for each measure.

2 GREENHOUSE GAS EMISSIONS FORECASTS

As part of the CAP Update development process, GHG emissions forecasts were calculated to estimate future levels of community and municipal operations emissions, absent City-specific reduction measures. Emissions forecasts were prepared for legislative-adjusted "business-as-usual" (BAU) scenarios for 2030, 2040, and 2045 for both the community and municipal operations. The community legislative-adjusted BAU forecast scenario accounts for anticipated growth in community emissions associated with changes and growth in the city, along with legislative actions to reduce emissions because of State and federal regulations, programs, or other mandated actions. The municipal operations legislative-adjusted BAU forecast scenario accounts for anticipated municipal growth as well as relevant State and federal legislative actions that are expected to reduce emissions. A summary of legislative reductions applied in the legislative-adjusted BAU forecast scenarios is provided in the City of Milpitas Climate Action Plan Update, Greenhouse Gas Emissions Forecasts – Technical Memorandum" dated April 1, 2021 (hereafter referenced as "Forecasts Memo").

2.1 COMMUNITY GREENHOUSE GAS EMISSIONS FORECASTS

The legislative-adjusted BAU forecasts for the City's community GHG emissions are summarized in Table 1. Under the legislative-adjusted BAU forecast, the City's GHG emissions are projected to decrease by approximately 10 percent between 2019 and 2045, despite an increase of 19 percent in population. Further details with respect to the community GHG emissions forecasts are discussed in the Forecasts Memo.

Table 1 City of Milpitas 2019 Community GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Sector	2019	2030	2040	2045
Residential Building Energy	42,218	42,660	43,399	43,658
Nonresidential Building Energy	98,319	93,467	82,288	77,177
On-Road Transportation	259,627	236,310	218,898	221,388
Off-Road Vehicles and Equipment	15,554	21,139	22,984	23,421
Solid Waste	23,566	25,026	27,215	28,074
Water Supply	694	421	153	0
Wastewater Treatment	1,578	1,612	1,692	1,713
Total	**441,557**	**420,636**	**396,629**	**395,432**

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Forecasts prepared by Ascent Environmental in 2021.

2.2 MUNICIPAL OPERATIONS GREENHOUSE GAS EMISSIONS FORECASTS

The legislative-adjusted BAU forecasts for the City's municipal operations GHG emissions are summarized in Table 2. Under the legislative-adjusted BAU forecast, municipal operations GHG emissions are projected to decrease by approximately 15 percent between 2019 and 2045, despite a 10 percent increase in municipal employment. Further details with respect to the municipal operations GHG emissions forecasts are discussed in the Forecasts Memo.

Table 2 City of Milpitas 2019 Municipal Operations GHG Emissions Inventory and Legislative-Adjusted BAU Forecasts ($MTCO_2e$)

Sector	2019	2030	2040	2045
Buildings and Facilities	870	889	897	900
Streetlights and Traffic Signals	3	2	1	0
Employee Commute	1,195	1,017	961	961
Vehicle Fleet	1,081	925	840	830
Solid Waste	53	56	57	58
Water Supply	41	25	8	0
Wastewater Treatment	9	9	9	9
Total	3,252	2,923	2,773	2,759

Notes: Total may not sum exactly due to independent rounding. BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Forecasts prepared by Ascent Environmental in 2021.

3 GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

As directed in Assembly Bill (AB) 32, Senate Bill (SB) 32, Executive Order (EO) B-55-18, and EO S-3-05, the State aims to reduce annual GHG emissions to:

- 1990 levels by 2020;
- 40 percent below 1990 levels by 2030;
- carbon neutrality by 2045; and
- 80 percent below 1990 levels by 2050.

Signed in 2019, EO B-55-18 established a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve net negative emissions thereafter. The carbon neutrality goal is separate from and complements existing statewide targets and goals for reducing GHG emissions. EO B-55-18 is the first California executive order or legislative action to explicitly mention the use of carbon sequestration to achieve GHG reduction targets and goals; therefore, it is distinct from other State reduction targets and goals and does not compete or conflict with existing policies.

The City aims to reduce GHG emissions in proportion to the State's targets and goals. Community emissions levels from 1990 are not available, which is the case for most local jurisdictions in California. Thus, community GHG reduction targets for the City's CAP Update were developed relative to the City's 2005 community emissions inventory, and municipal operations targets were developed relative the 2019 municipal operations inventory, consistent with guidance provided by the California Air Resources Board (CARB). Community GHG emissions in 2005 were 547,972 metric tons of carbon dioxide equivalent ($MTCO_2e$), and municipal operations emissions in 2019 were 3,252 $MTCO_2e$. The methodology used to calculate the City's emissions reduction targets is described below.

3.1 CALIFORNIA'S 2017 CLIMATE CHANGE SCOPING PLAN AND 2005 GHG INVENTORY

CARB's 2017 Climate Change Scoping Plan (2017 Scoping Plan) reports statewide GHG emissions for eight sectors: agriculture, residential and commercial, electric power, high global warming potential (GWP) gases, industrial, recycling and waste, transportation, and cap-and-trade program (CARB 2017). CARB's 2005 California GHG inventory also reports statewide GHG emissions for these eight sectors (CARB 2020). For each sector, the 2017 Scoping Plan reports the 1990 emissions levels and ranges of reductions needed by 2030 for the State to achieve the SB 32 target of reducing statewide emissions to 40 percent below 1990 levels. CARB estimates that some emissions sectors will need to achieve greater proportional reductions than others to achieve the 2030 target because of multiple factors (e.g., the 2017 Scoping Plan assumes 2030 emissions reductions up to 72 percent below 1990 levels for the electric power sector, and up to 15 percent below 1990 levels for the industrial sector). This technical memorandum is based on the low end of the emissions range for each sector reported in the 2017 Scoping Plan because this scenario places less emphasis on reductions associated with the Cap-and-Trade Regulation and requires greater reductions from other State and local actions. Use of these emissions estimates resulted in the development of more stringent GHG reduction targets for the target years. CARB reports the overall statewide emissions reductions needed to achieve the State's 2050 goal, but to-date has not analyzed or reported needed emissions reductions by sector to achieve the 2050 goal, nor has it analyzed or reported reductions by sector required to meet the carbon neutrality goal in 2045.

Chapter 5, "Achieving Success," of the 2017 Scoping Plan recommends several approaches for local plan-level projects to show consistency with State targets. As an overall goal, "CARB recommends statewide targets of no more than six metric tons CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050" (CARB 2017:99). However, not all emissions sector reductions can be achieved at the local level because local agencies often

do not have jurisdiction over the emissions sectors included in the statewide inventory used to develop the statewide targets. CARB includes the following recommendations for demonstrating how local jurisdictions can demonstrate consistency with statewide targets. The following language in the 2017 Scoping Plan is related to local plan-level GHG reduction goals (CARB 2017:100):

> CARB advises that local governments also develop community-wide GHG emissions reduction goals necessary to reach 2030 and 2050 climate goals. Emissions inventories and reduction goals should be expressed in mass emissions, per capita emissions, and service population emissions. To do this, local governments can start by developing a community-wide GHG emissions target consistent with the accepted protocols as outlined in OPR's General Plan Guidelines Chapter 8: Climate Change. They can then calculate GHG emissions thresholds by applying the percent reductions necessary to reach 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to their community-wide GHG emissions target. Since the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state, it is appropriate for local jurisdictions to derive evidence-based local per capita goals based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets. The resulting GHG emissions trajectory should show a downward trend consistent with the statewide objectives. The recommendation for a community-wide goal expands upon the reduction of 15 percent from "current" (2005-2008) levels by 2020 as recommended in the 2008 Scoping Plan.

As discussed above, the statewide per capita targets account for all emissions sectors in the State's GHG emissions inventory, statewide population forecasts for 2030 and 2050, and all statewide reductions necessary to achieve the 2030 statewide target under SB 32 in all sectors. The per capita targets reported in the Scoping Plan are framed as targets that must be met on a statewide basis; however, this does not mean that the statewide per capita targets must be applied uniformly to every local jurisdiction or special district.

3.2 COMMUNITY GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

Based on a review of the 2017 Scoping Plan and an understanding of activities occurring within the city, the City has direct or indirect jurisdiction over activities that generate emissions and contribute to reductions in four of the eight emissions sectors included in the 2017 Scoping Plan: residential and commercial, electric power, recycling and waste, and transportation. The City does not have jurisdiction over agricultural activities nor is any agriculture present within City boundaries. The City also has limited influence over high GWP gases, and industrial activities in the city are very limited. Lastly, no facilities regulated under the State's Cap-and-Trade Regulation exist within city boundaries. Therefore, by excluding these sectors under this approach, community GHG reduction targets would be established in proportion with statewide reductions for all sectors relevant to City jurisdiction to the extent feasible using available data. This target setting approach is consistent with the California Supreme Court decision in *Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (2015) 62 Cal.4th 204*, which determined that the approach of assessing a project's consistency with statewide emission reduction goals must include a "reasoned explanation based on substantial evidence" that links the project's emission to the statewide GHG reduction goals.

The first step in determining community targets under this approach is to compare the State's GHG inventories for 1990 and 2005 (i.e., the City's baseline inventory year) for the relevant sectors (i.e., excluding agriculture, high GWP, industrial, and Cap-and-Trade). All sectors that were included in the 2017 Scoping Plan are shown below in Table 3 for 1990, 2005, 2020, and 2030. According to the inventories available from CARB, statewide emissions from the relevant sectors were approximately 311 million $MTCO_2e$ ($MMTCO_2e$) in 1990 and 346 $MMTCO_2e$ in 2005 (CARB 2020) (note: sector-specific emissions totals and reductions reported in the 2017 Scoping Plan reflect rounding). Thus, 2005 statewide emissions were approximately 35 $MMTCO_2e$ (11 percent) higher than the 1990 level and the State's 2020 GHG target (i.e., reduce emissions to 1990 levels by 2020).

Table 3 2017 Climate Change Scoping Plan Estimated Change in Emissions by Sector

GHG Emissions by Sector ($MMTCO_2e$)	1990	2005	2020	2030[1]
Agriculture	26	34	36	24
Residential and Commercial	44	43	50	38
Electric Power	108	108	104	30
High GWP	3	9	31	8
Industrial	98	95	94	83
Recycling and Waste	7	8	9	8
Transportation	152	187	185	103
Cap-and-Trade	NA	NA	-78	-34
Natural and Working Lands Net Sink	-7	NA	NA	NA
Total	431	484	431	260
Adjusted Total (Excludes Agriculture, High GWP, Industrial, and Cap-and-Trade Sectors)	311	346	348	179

Notes: GHG = greenhouse gases; GWP = global warming potential; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent; NA = not applicable.

[1] The 2030 values shown are from the lower end of the ranges reported in the 2017 Climate Change Scoping Plan, Table 3.

Source: CARB 2014; CARB 2017; CARB 2020.

According to the 2017 Scoping Plan, statewide emissions from sectors relevant to the City's inventory must be reduced to 311 $MMTCO_2e$ by 2020 for the State to achieve its 2020 goal. Relative to 2005 levels of 346 $MMTCO_2e$, this translates to a reduction of 35 $MMTCO_2e$, or 10 percent. In addition to this target, the City's 2013 CAP also included a target to reduce GHG emissions by 15 percent below 2005 levels by 2020.

Based on an updated inventory of GHG emissions, community emissions in the city in 2019 were 441,557 $MTCO_2e$. The 2019 emissions level represents a reduction of approximately 19 percent below 2005 levels and is lower than the City's estimated target for 2020 of 493,111 $MTCO_2e$, as shown in Table 4, as well as the target previously set in the City's 2013 CAP (i.e., a 15 percent reduction below 2005 levels by 2020). Consequently, no further reductions from 2005 emissions levels are needed from the relevant sectors to reach the 2020 target, so discussion regarding the 2020 target is excluded from the remainder of this technical memorandum.

According to the 2017 Scoping Plan, statewide emissions from the sectors relevant to the City's inventory must be reduced to 179 $MMTCO_2e$ by 2030 for the State to achieve its 2030 goal. This represents an emissions reduction of approximately 167 $MMTCO_2e$, or 48 percent, by 2030, relative to 2005 levels of 346 $MMTCO_2e$. Consistent with the State's goal under EO B-55-18, the City has chosen to adopt a target to achieve carbon neutrality no later than 2045. An interim 2040 target was also established based on interpolation between the 2030 and 2045 targets. Therefore, consistent with State targets and goals and considering relevant emissions sectors, the City's community GHG reduction targets are as follows:

- 2030 target: 48 percent below 2005 levels (283,817 $MTCO_2e$);
- 2040 target: 83 percent below 2005 levels (94,606 $MTCO_2e$); and
- 2045 target: carbon neutrality (0 $MTCO_2e$).

Table 4 shows how the City's targets were derived based on adjusted statewide GHG emissions data and projections and summarizes the targets for 2020, 2030, 2040, and 2045.

Table 4 Statewide and City of Milpitas Community GHG Emissions Reduction Targets Below 2005 Levels

Source	2020	2030	2040	2045
2017 Scoping Plan Emissions Limit ($MMTCO_2e$)	431	260	NA	NA
Adjusted 2017 Scoping Plan Emissions Limit[1] ($MMTCO_2e$)	311	179	NA	NA
City Community Target Percent Reduction from 2005 Levels	10%	48%	83%	Carbon Neutrality
City Community Target Annual Emissions ($MTCO_2e$)	493,111	283,817	94,606	0

Notes: GHG = greenhouse gases; $MTCO_2e$ = metric tons of carbon dioxide equivalent; $MMTCO_2e$ = million metric tons of carbon dioxide equivalent; NA = not applicable.

[1] Excludes agriculture, high GWP, industrial, and cap-and-trade sectors because they are not relevant to the City's inventory.

Source: Calculated by Ascent Environmental in 2021.

In 2021, the City conducted a 2019 GHG emissions inventory for community emissions. Based on the City's 2019 inventory, emissions were 441,557 $MTCO_2e$. Applying the above targets to the 2019 emissions level results in the following targets:

- 2030 target: 36 percent below 2019 levels (283,817 $MTCO_2e$);
- 2040 target: 79 percent below 2019 levels (94,606 MTCO2e); and
- 2045 target: carbon neutrality (0 $MTCO_2e$).

The City's community targets relative to the 2019 emissions level are used throughout the remainder of this technical memorandum and will be used in the CAP. These targets, along with the legislative-adjusted BAU forecast emissions and estimated reductions required to achieve the targets, are summarized in Table 5.

Table 5 City of Milpitas Community Legislative-Adjusted BAU Emissions Forecast and GHG Emissions Reduction Targets Below 2019 Levels

Source	2019	2030	2040	2045
Community Emissions and Legislative-Adjusted BAU Forecast ($MTCO_2e$)	441,557	420,636	396,629	395,432
Community Target Percent Reduction Below 2019 Levels	NA	36%	79%	Carbon Neutrality
Community Target Annual Emissions ($MTCO_2e$)	NA	283,817	94,606	0
Reduction from 2019 Needed to Meet Target ($MTCO_2e$)	NA	136,819	302,023	395,432

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent per year; NA = not applicable.

Source: Calculations conducted by Ascent Environmental in 2021.

Figure 1 depicts the community legislative-adjusted BAU GHG emissions forecasts by sector, as distinguished by colored wedges, and the City's emissions reduction targets relative to the 2019 emissions inventory. The space between the trajectory of the black line (i.e., targets) and the top of the colored wedges (i.e., forecasted emissions) represents the "gap" in emissions that will need to be addressed through local actions for the City to meet its community GHG reduction targets.

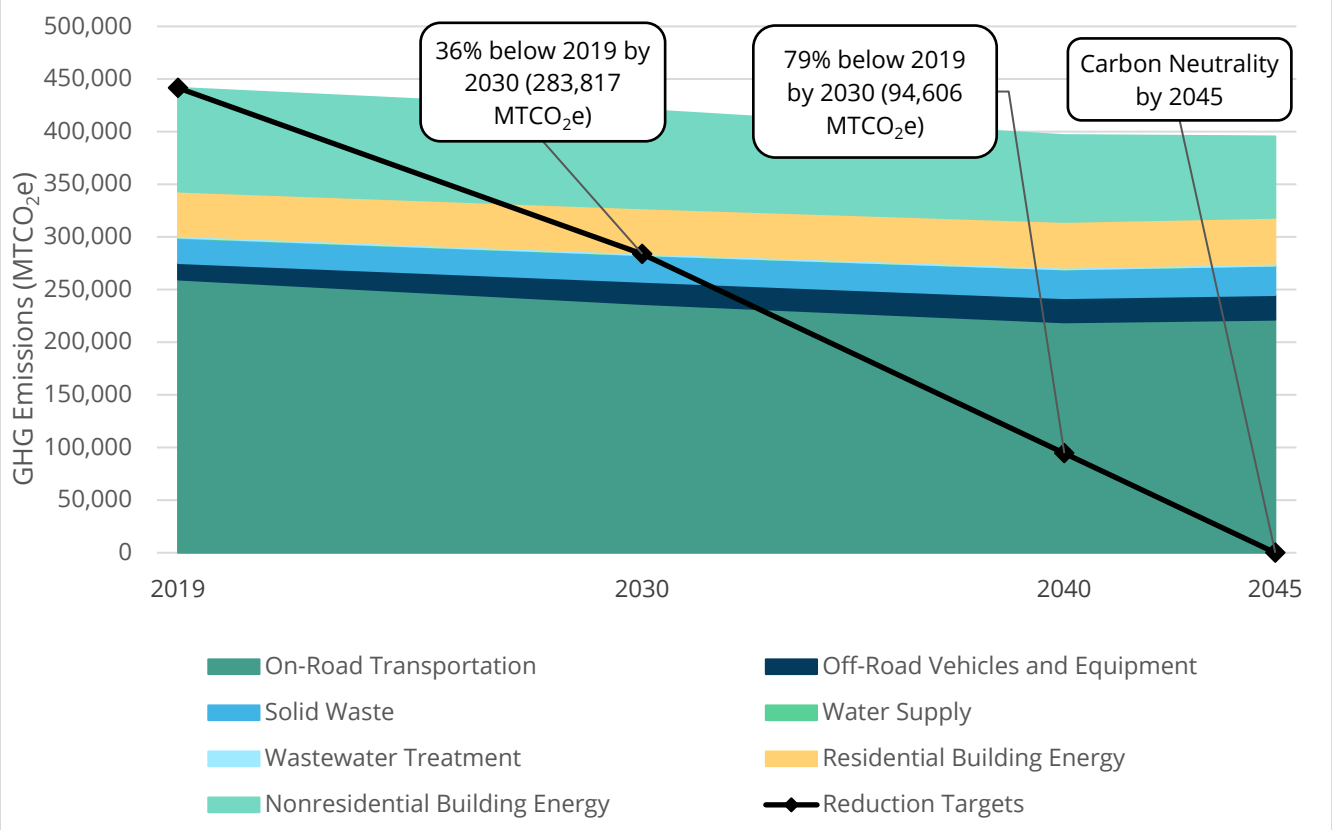

Figure 1 City of Milpitas Community Legislative-Adjusted BAU Emissions Forecast by Sector and GHG Emissions Reduction Targets: 2030, 2040, and 2045

3.3 MUNICIPAL OPERATIONS GREENHOUSE GAS EMISSIONS REDUCTION TARGETS

The City aims to reduce its municipal operations emissions in proportion to the State's targets and goals (outlined in in the beginning of Section 2). Like most local public agencies in California, municipal operations emissions levels for 1990 are not available, so GHG reduction targets for the City's municipal operations were developed relative to the City's municipal operations 2019 emissions inventory, consistent with CARB guidance. The methodology used to calculate the City's municipal operations emissions reduction targets for 2030, 2040, and 2045 is consistent with the methodology used to calculate community targets described in Section 2.1.

Municipal operations GHG emissions in 2019 were 3,252 $MTCO_2e$. Therefore, the City's municipal operations GHG reduction targets are as follows, consistent with State targets and goals:

- 2030 target: 36 percent below 2019 levels (2,090 $MTCO_2e$);
- 2040 target: 79 percent below 2019 levels (697 MTCO2e); and
- 2045 target: carbon neutrality (0 $MTCO_2e$).

These targets, along with the legislative-adjusted BAU forecast emissions and estimated reductions required to achieve the targets, are summarized in Table 6.

Table 6 City of Milpitas Municipal Operations Legislative-Adjusted BAU Emissions Forecast and GHG Emissions Reduction Targets Below 2019 Levels

Source	2019	2030	2040	2045
Municipal Operations Emissions and Legislative-Adjusted BAU Forecast ($MTCO_2e$)	3,252	2,923	2,773	2,759
Municipal Operations Target Percent Reduction Below 2019 Levels	NA	36%	79%	Carbon Neutrality
Municipal Operations Target Annual Emissions ($MTCO_2e$)	NA	2,090	697	0
Reduction from 2019 Needed to Meet Target ($MTCO_2e$)	NA	832	2,076	2,759

Notes: BAU = business-as-usual; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent per year; NA = not applicable.

Source: Calculations conducted by Ascent Environmental in 2021.

Figure 2 depicts the municipal operations legislative-adjusted BAU GHG emissions forecasts by sector, as distinguished by colored wedges, and the City's municipal operations emissions reduction targets relati ve to the 2019 emissions inventory. The space between the trajectory of the black line (i.e., targets) and the top of the colored wedges (i.e., forecasted emissions) represents the gap in emissions that will need to be addressed through local actions for the City to meet its municipal operations GHG reduction targets.

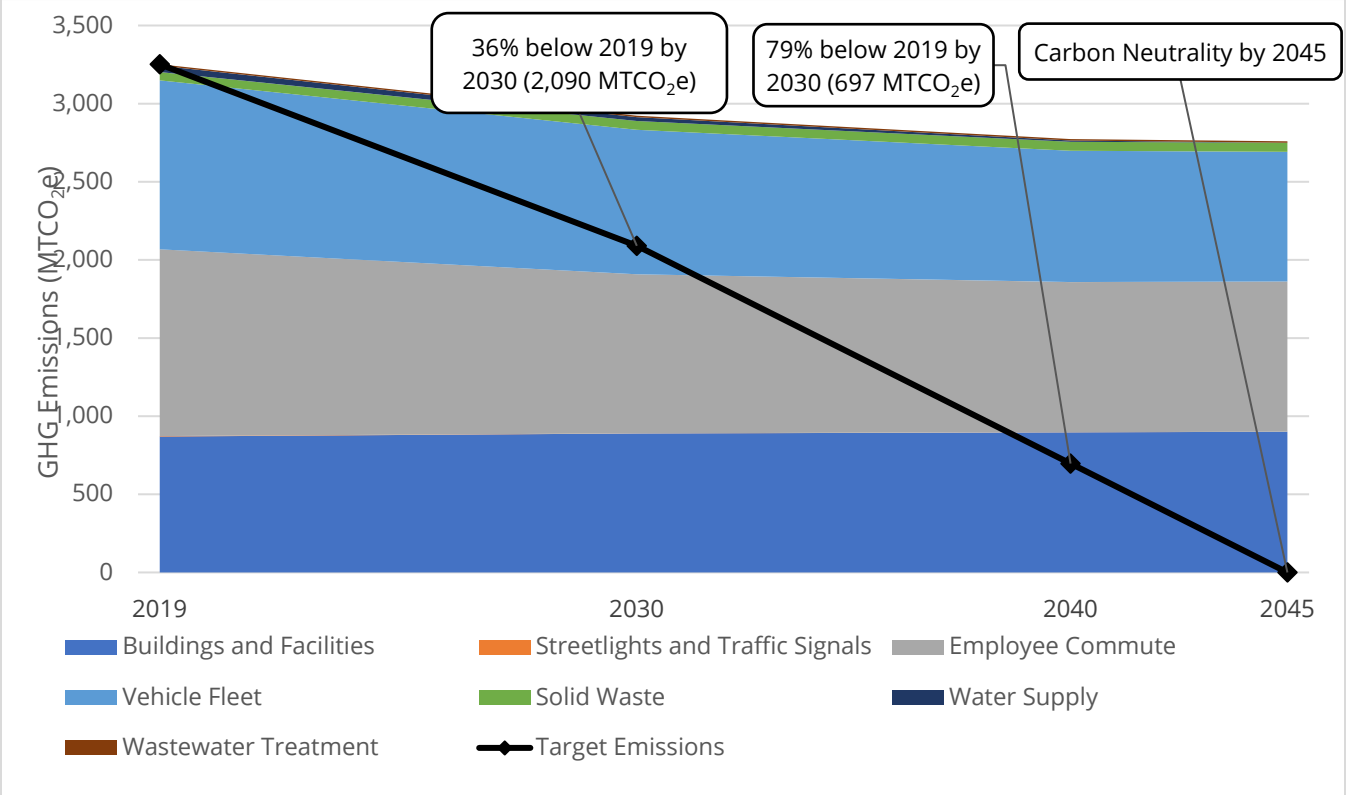

Figure 2 City of Milpitas Municipal Operations Legislative-Adjusted BAU Emissions Forecast by Sector and Emissions Reduction Targets: 2030, 2040, and 2045

4 GREENHOUSE GAS EMISSIONS REDUCTION MEASURES

4.1 COMMUNITY GREENHOUSE GAS EMISSIONS REDUCTION MEASURES

As discussed above, additional GHG reductions are needed to achieve the community emissions reduction targets for 2030, 2040, and 2045. Ascent worked with City staff to develop a draft list of recommended GHG reduction measures based on measures already identified in the City's 2013 CAP, 2020 General Plan, and other City plans, as well as new measures informed by community outreach and current best practices.

The measures presented below are organized under six categories that generally align with the emissions sectors included in Table 1: building energy (including residential and non-residential building energy), on-road transportation, off-road vehicles and equipment, solid waste, water and wastewater, and miscellaneous (note: this sector is not represented in the City's inventory or Table 1). Each category includes one or more broad strategies to reduce emissions, such as energy efficiency, renewable energy, and zero waste. The measures are organized under each strategy, which are more specific expressions of the strategies. Metrics are provided for measures that are quantified to help the City meet its reduction targets. These include performance indicators by which progress can be tracked and monitored for implementation. Although they are not included in this technical memorandum, the proposed measures are broken down into one or more actions that the City can implement to reduce GHG emissions. Many of the measures also include supporting activities, or initiatives that can be implemented that will support measures and are important in overall implementation but may not directly lead to quantifiable GHG reductions. The actions and supporting activities are not included in this gap analysis but will be included in the implementation chapter of the CAP Update document.

Additionally, co-benefits associated with each GHG reduction measure are identified, which may include improvements to local air quality, positive public health outcomes, enhanced resilience, cost savings, improved transportation options, economic development opportunities, improved water security, benefits to the natural environment and biodiversity, and consistency with other City plans. In the CAP, all measures and/or actions will also include an analysis of the staff time needed for implementation, and they will identify which agencies and departments will be responsible for implementation as well as stakeholder groups where partnerships can be formed to ensure success.

GHG reductions associated with these recommended measures were calculated in a stepwise manner for the future years of 2030, 2040, and 2045. In other words, GHG reductions (in $MTCO_2e$) are assessed during a snapshot in time in years 2030, 2040, and 2045. Measures are quantified for a single year rather than adding cumulative reductions from prior years, which aligns with the methodology used to derive the City's GHG reduction targets. Importantly, GHG emissions reductions were quantified for measures wherever substantial evidence and reasonable assumptions were available to support calculations. City staff and Ascent also identified measures that were not quantifiable because of lack of available data or quantification methods but would still be expected to reduce GHG emissions. These measures are listed in this technical memorandum and will be discussed qualitatively in the CAP Update document. They can be monitored for potential quantification opportunities in the future if data and/or quantification methods become available.

Preliminary estimates of GHG emissions reductions, along with an estimated emissions "gap" (i.e., the difference between the effective GHG reductions required to meet the targets and the total GHG reductions), are summarized in Table 7 below and illustrated in Figure 3 in Section 3.1.7. Descriptions of the measures are provided in the following sections. Detailed measure calculations and assumptions supporting the GHG reduction estimates are provided in Attachment A.

Table 7 Community GHG Emissions Reduction Measures

Measure Number	Strategy	Measure	GHG Reductions ($MTCO_2e$)		
			2030	2040	2045
Building Energy					
BE-1.1	Energy Efficiency and Electrification	Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	NA	NA	NA
BE-1.2		Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.	13,596	29,050	41,637
BE-1.3		Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.	8,515	21,867	41,308
BE-1.4		Reduce plug loads in existing buildings.	NA	NA	NA
BE-2.1	Low Carbon Development	Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	4,445	7,005	8,945
BE-2.2		Facilitate all-electric development projects for industrial buildings.	NA	NA	NA
BE-2.3		Expand the City's Green Building Program.	NA	NA	NA
BE-3.1	Clean Energy	Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	22,581	8,691	0
BE-3.2		Develop innovative approaches to energy generation, distribution, and storage.	NA	NA	NA
BE-3.3		Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	NA	NA	NA
		Building Energy Subtotal	*49,138*	*66,613*	*91,890*
On-Road Transportation					
TR-1.1	Sustainable Transportation and Land Use Planning	Reduce VMT from new development in compliance with the City's requirements for SB 743.	3,852	7,029	10,714
TR-1.2		Increase high-density, transit-oriented development that limits sprawl.	7,469	6,626	6,350
TR-1.3		Create car-free commercial districts.	NA	NA	NA
TR-2.1	Low- and Zero-Emission Vehicles	Increase EV charging infrastructure.	47,065	115,567	156,570
TR-2.2		Increase EV and low-carbon vehicle adoption.			
TR-2.3		Reduce fossil fuel vehicles.			
TR-2.4		Increase low- and zero-emission fleet vehicles.			
TR-3.1	Transit System Improvements	Enhance and expand transit facilities and infrastructure.	14,418	16,124	18,852
TR-3.2		Increase transit ridership.			
TR-4.1	Active Transportation	Improve active transportation options.	55	99	128
TR-5.1	Transportation Demand Management	Increase implementation of transportation TDM strategies.	10,191	10,836	10,700
TR-5.2		Reduce VMT from businesses.			
TR-6.1	Vehicle Idling	Reduce vehicle idling.	NA	NA	NA
TR-7.1	Parking	Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	NA	NA	NA
		On-Road Transportation Subtotal	*83,076*	*156,282*	*203,314*

Measure Number	Strategy	Measure	GHG Reductions ($MTCO_2e$)		
			2030	2040	2045
Off-Road Vehicles and Equipment					
OT-1.1	Electrification and Clean Alternatives	Reduce landscaping-related emissions.	962	1,681	1,759
OT-1.2		Reduce construction-related emissions.	2,361	3,746	5,176
		Off-Road Vehicles and Equipment Subtotal	*3,324*	*5,427*	*6,935*
Solid Waste					
SW-1.1	Zero Waste	Eliminate the disposal of organic solid waste in landfills.	9,385	17,010	21,055
SW-1.2		Increase recycling and the diversion of other inorganic solid waste.			
SW-1.3		Reduce the generation of waste from residents and businesses.			
SW-1.4		Reduce the generation of construction and demolition waste.			
SW-1.5		Facilitate repair and reuse of consumer products.			
SW-2.1	Landfill Emissions	Dispose waste at innovative facilities.	NA	NA	NA
SW-2.2		Support waste-to-energy facilities.	NA	NA	NA
SW-3.1	Waste Policy	Engage with waste-related policy making.	NA	NA	NA
		Solid Waste Subtotal	*9,385*	*17,010*	*21,055*
Water and Wastewater					
WA-1.1	Water Conservation	Reduce indoor water consumption in buildings.	128	62	0
WA-1.2		Reduce water consumption for irrigation and landscaping.	110	48	0
WA-2.1	Recycled Water	Increase the use of recycled water.	NA	NA	NA
WA-3.1	Wastewater Treatment	Generate biogas at wastewater treatment plants.	NA	NA	NA
		Water and Wastewater Subtotal	*237*	*110*	*0*
Miscellaneous					
MI-1.1	Urban Forestry and Open Space	Protect native trees and vegetation and enhance carbon sequestration.	2,632	6,601	8,586
MI-2.1	Urban Heat Island Reduction	Reduce the urban heat island effect to conserve energy.	NA	NA	NA
MI-3.1	Green Infrastructure	Increase the use of green infrastructure.	NA	NA	NA
MI-4.1	Green Business and Jobs	Incentivize and promote green business practices.	NA	NA	NA
MI-4.2		Support green jobs in the city.	NA	NA	NA
MI-5.1	Carbon Sequestration and Embodied Emissions	Increase soil carbon content.	NA	NA	NA
MI-5.2		Use low-carbon and carbon sequestering construction materials in new development.	NA	NA	NA
		Miscellaneous Subtotal	*2,632*	*6,601*	*8,586*
Total Reductions from Measures			**147,791**	**252,043**	**331,780**
Reduction Needed to Meet Target			136,819	302,023	395,432
Target Met?			Yes	No	No
Remaining Gap to Target			(10,971)[1]	49,980	63,651

Notes: Total may not sum exactly due to independent rounding. EV = electric vehicle; GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; NA = not applicable; SB = Senate Bill; TDM = transportation demand management; VMT = vehicle miles traveled.

1 Indicates target has been achieved with a surplus of reductions.

Source: Calculations conducted by Ascent Environmental in 2021.

4.1.1 Building Energy

ENERGY EFFICIENCY AND ELECTRIFICATION

Measure BE-1.1: Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.

Quantification assumptions: Not quantified.

Co-benefits: economic development, plan consistency

Measure BE-1.2: Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.

Quantification assumptions: This measure assumes that 36 percent of existing residential buildings are retrofitted by 2030, 72 percent are retrofitted by 2040, and 100 percent are retrofitted by 2045, based on Zero-Carbon Buildings in California: A Feasibility Study (Mozingo 2021).

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

Measure BE-1.3: Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.

Quantification assumptions: This measure assumes that 13 percent of existing nonresidential buildings are retrofitted by 2030, 32 percent are retrofitted by 2040, and 60 percent are retrofitted by 2045, based on Zero-Carbon Buildings in California: A Feasibility Study (Mozingo 2021). It also assumes that 40 percent of fossil fuel-powered backup generators in existing development are converted to battery-powered backup systems by 2030 and 100 percent are converted by 2040.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

Measure BE-1.4: Reduce plug loads in existing buildings.

Quantification assumptions: Not quantified.

Co-benefits: resilience, cost savings, water security, plan consistency

LOW CARBON DEVELOPMENT

Measure BE-2.1: Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.

Quantification assumptions: This measure assumes that all residential and nonresidential development built in 2023 or later is all-electric. It assumes that no fossil fuel-powered backup generators are installed in new development by 2030.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

Measure BE-2.2: Facilitate all-electric development projects for industrial buildings.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

Measure BE-2.3: Expand the City's Green Building Program.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

CLEAN ENERGY

Measure BE-3.1: Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.

Quantification assumptions: This measure assumes that all electricity consumed within the city is generated from carbon-free sources by 2030 (either from Silicon Valley Clean Energy-supplied carbon-free grid electricity or on-site renewable energy installations).

Co-benefits: resilience, cost savings, plan consistency

Measure BE-3.2: Facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids).

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, plan consistency

Measure BE-3.3: Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

4.1.2 On-Road Transportation

SUSTAINABLE TRANSPORTATION AND LAND USE PLANNING

Measure TR-1.1: Reduce vehicle miles traveled (VMT) from new development in compliance with SB 743.

Quantification assumptions: This measure assumes all new development projects within the city comply with the City's SB 743 requirements and achieve a 15 percent reduction in new project-generated VMT by 2030, a 20 percent reduction by 2040 and a 25 percent reduction by 2045.

Co-benefits: local air quality, public health, natural environment and biodiversity, plan consistency

Measure TR-1.2: Increase high-density, transit-oriented development that limits sprawl.

Quantification assumptions: This measure assumes that the City amends existing and/or develops new zoning codes and ordinances that support and promote high-density, transit-oriented, mixed-use development and complete streets and neighborhoods within the city. This measure assumes that these actions result in a 3 percent decrease of existing passenger VMT, based on Zero-Carbon Buildings in California: A Feasibility Study (Mozingo 2021) and California Air Pollution Control Officers Association's (CAPCOA's) Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity (Handbook), Measure T-17 (CAPCOA 2021).

Co-benefits: local air quality, public health, resilience, cost savings, transportation options, natural environment and biodiversity, plan consistency

Measure TR-1.3: Create car-free commercial districts.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, natural environment and biodiversity

LOW- AND ZERO-EMISSION VEHICLES

Measure TR-2.1: Increase electric vehicle (EV) charging infrastructure.

Quantification assumptions: This measure assumes that the percentage of passenger EVs will be 36 percent of total passenger vehicles in the city in 2030, 59 percent in 2040, and 85 percent in 2045, consistent with the statewide EV targets under EO N-79-20 and CARB's Revised Draft 2020 Mobile Source Strategy (CARB 2021) (2020 MSS). This measure also assumes that the percentage of medium- and heavy-duty EVs in the city will increase by 26 percent by 2030, 102 percent by 2040, and 127 percent by 2045, consistent with the 2020 MSS.

Co-benefits: local air quality, public health, cost savings, transportation options, economic development, natural environment and biodiversity, plan consistency

Measure TR-2.2: Increase EV and low-carbon vehicle adoption.

Quantification assumptions: Quantified in combination with Measure TR-2.1.

Co-benefits: local air quality, public health, cost savings, transportation options, natural environment and biodiversity, plan consistency

Measure TR-2.3: Reduce fossil fuel vehicles.

Quantification assumptions: Quantified in combination with Measure TR-2.1.

Co-benefits: local air quality, public health, cost savings, natural environment and biodiversity, plan consistency

Measure TR-2.4: Increase low- and zero-emission fleet vehicles.

Quantification assumptions: Quantified in combination with Measure TR-2.1.

Co-benefits: local air quality, public health, natural environment and biodiversity, plan consistency

TRANSIT SYSTEM IMPROVEMENTS

Measure TR-3.1: Enhance and expand transit facilities and infrastructure.

Quantification assumptions: This measure assumes that comprehensive expansion of the transit network will result in a 10.3 percent reduction in citywide passenger VMT in 2030, 12.5 percent in 2040, and 14.8 percent in 2045 (Mozingo 2021).

Co-benefits: local air quality, public health, resilience, cost savings, transportation options, economic development, natural environment and biodiversity, plan consistency

Measure TR-3.2: Increase transit ridership.

Quantification assumptions: Quantified in combination with Measure TR-3.1.

Co-benefits: local air quality, public health, cost savings, transportation options, natural environment and biodiversity, plan consistency

ACTIVE TRANSPORTATION

Measure TR-4.1: Increase active transportation options.

Quantification assumptions: This measure assumes 50 miles of new bike lanes will be installed by 2030, 70 miles by 2040, and 80 miles by 2045. The City's new Trail, Pedestrian, and Bicycle Master Plan proposes approximately 50 miles of new bikeway by 2030 (City of Milpitas 2021). This measure assumes 25 miles of new pedestrian paths will be installed by 2030, 35 miles by 2040, and 40 miles by 2045.

Co-benefits: local air quality, public health, resilience, cost savings, transportation options, economic development, natural environment and biodiversity, plan consistency

TRANSPORTATION DEMAND MANAGEMENT

Measure TR-5.1: Increase implementation of transportation demand management (TDM) strategies.

Quantification assumptions: This measure assumes that commuting travel in the city is responsible for 28 percent of passenger VMT (AASHTO 2013). This measure assumes implementation of a suite of TDM strategies results in a 26 percent reduction in passenger commute VMT by 2030, 30 percent by 2040, and 30 percent by 2045, based on CAPCOA's Handbook, Measure T-5 (CAPCOA 2021).

Co-benefits: local air quality, public health, transportation options, economic development, natural environment and biodiversity, plan consistency

Measure TR-5.2: Reduce VMT from businesses.

Quantification assumptions: Quantified in combination with measure TR-5.1

Co-benefits: local air quality, public health, cost savings, transportation options, natural environment and biodiversity, plan consistency

VEHICLE IDLING

Measure TR-6.1: Reduce vehicle idling.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, cost savings, natural environment and biodiversity, plan consistency

PARKING

Measure TR-7.1: Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, natural environment and biodiversity, plan consistency

4.1.3 Off-Road Vehicles and Equipment

ELECTRIFICATION AND CLEAN ALTERNATIVES

Measure OT-1.1: Reduce landscaping-related emissions.

Quantification assumptions: This measure assumes that all new landscaping equipment is electrified starting in 2024. This measure assumes that 60 percent of existing landscaping equipment will be replaced with zero-emission alternatives by 2030 and 100 percent by 2040.

Co-benefits: local air quality, public health, natural environment and biodiversity, plan consistency

Measure OT-1.2: Reduce construction-related emissions.

Quantification assumptions: This measure assumes that 40 percent of construction equipment will use renewable diesel or other zero-carbon alternatives by 2030, 60 percent by 2040, and 80 percent by 2045.

Co-benefits: local air quality, public health, natural environment and biodiversity, plan consistency

4.1.4 Solid Waste

ZERO WASTE

Measure SW-1.1: Eliminate the disposal of organic solid waste in landfills.

Quantification assumptions: This measure assumes an estimated waste diversion rate of 60 percent for the city in 2019[1]. This measure assumes that the city's diversion rate increases to 75 percent by 2030, 85 percent by 2040, and 90 percent by 2045.

Co-benefits: plan consistency

Measure SW-1.2: Increase recycling and the diversion of other inorganic solid waste.

Quantification assumptions: Quantified in combination with Measure SW-1.1.

Co-benefits: plan consistency

Measure SW-1.3: Reduce the generation of waste from residents and businesses.

Quantification assumptions: Quantified in combination with Measure SW-1.1.

Co-benefits: cost savings, plan consistency

Measure SW-1.4: Reduce the generation of construction and demolition waste.

Quantification assumptions: Quantified in combination with Measure SW-1.1.

Co-benefits: local air quality, public health, cost savings, plan consistency

[1] The City's true waste diversion rate in 2019 is uncertain; data provided by CalRecycle differs significantly from the City's internally calculated rate. Quantification calculations assume an estimated diversion rate of 60 percent. This estimate is based on a combination of the data from CalRecycle, the City, and the statewide average diversion rate from 2010-2019.

Measure SW-1.5: Facilitate repair and reuse of consumer products.

Quantification assumptions: Quantified in combination with Measure SW-1.1.

Co-benefits: cost savings, plan consistency

LANDFILL EMISSIONS

Measure SW-2.1: Dispose waste at innovative facilities.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, plan consistency

Measure SW-2.2: Support waste-to-energy facilities.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, plan consistency

WASTE POLICY

Measure SW-3.1: Engage with waste-related policymaking.

Quantification assumptions: Not quantified.

Co-benefits: none

4.1.5 Water and Wastewater

WATER CONSERVATION

Measure WA-1.1: Reduce indoor water consumption in buildings.

Quantification assumptions: This measure assumes a 35 percent reduction in indoor water in new development consumption by 2030, a 45 percent reduction by 2040, and a 50 percent reduction by 2045, based on CAPCOA's Quantifying Greenhouse Gas Mitigation Measures Report, Measure WUW-1 (CAPCOA 2010). This measure also assumes a 30 percent reduction in indoor water consumption in existing development by 2030, 40 percent by 2040, and 45 percent by 2045.

Co-benefits: resilience, cost savings, water security, natural environment and biodiversity, plan consistency

Measure WA-1.2: Reduce water consumption for irrigation and landscaping.

Quantification assumptions: This measure assumes a 60 percent reduction in outdoor water consumption by 2030, 70 by 2040, and 75 by 2045 in new development. This measure assumes a 50 percent reduction in outdoor water consumption by 2030, 60 percent by 2040, and 65 percent by 2045 in existing development.

Co-benefits: resilience, cost savings, water security, natural environment and biodiversity, plan consistency

RECYCLED WATER

Measure WA-2.1: Increase the use of recycled water.

Quantification assumptions: Not quantified.

Co-benefits: resilience, cost savings, water security, natural environment and biodiversity, plan consistency

WASTEWATER TREATMENT

Measure WA-3.1: Generate biogas at wastewater treatment plants.

Quantification assumptions: Not quantified.

Co-benefits: resilience, plan consistency

4.1.6 Miscellaneous

URBAN FORESTRY AND OPEN SPACE

Measure MI-1.1: Protect native trees and vegetation and enhance carbon sequestration.

Quantification assumptions: This measure assumes that the tree coverage in the city increases from 13 percent in 2019 to 20 percent by 2030, 30 percent by 2040, and 35 percent by 2045.

Co-benefits: local air quality, public health, resilience, water security, natural environment and biodiversity, plan consistency

URBAN HEAT ISLAND REDUCTION

Measure MI-2.1: Reduce the urban heat island effect to conserve energy.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, cost savings, water security, natural environment and biodiversity, plan consistency

GREEN INFRASTRUCTURE

Measure MI-3.1: Increase the use of green infrastructure.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, economic development, water security, natural environment and biodiversity, plan consistency

GREEN BUSINESS AND JOBS

Measure MI-4.1: Incentivize and promote green business practices.

Quantification assumptions: Not quantified.

Co-benefits: economic development, plan consistency

Measure MI-4.2: Support green jobs in the city.

Quantification assumptions: Not quantified.

Co-benefits: economic development, water security, natural environment and biodiversity, plan consistency

CARBON SEQUESTRATION AND EMBODIED EMISSIONS

Measure MI-5.1: Increase soil carbon content.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, economic development, water security, natural environment and biodiversity, plan consistency

Measure MI-5.2: Require low-carbon and carbon sequestering construction materials in new development.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, resilience, economic development, natural environment and biodiversity, plan consistency

4.1.7 Community Conclusion

The total estimated GHG emissions reductions from all community measures quantified would be 147,791 $MTCO_2e$ in 2030; 252,043 $MTCO_2e$ in 2040; and 331,780 $MTCO_2e$ in 2045. This would result in total community GHG emissions of 272,845 $MTCO_2e$ in 2030; 144,586 $MTCO_2e$ in 2040; and 63,651$MTCO_2e$ in 2045. The total estimated reductions from all proposed GHG reduction measures would be sufficient to meet the 2030 target.

The scale of reductions required to achieve the 2040 target of 94,606 $MTCO_2e$ and the carbon neutrality target for 2045 discussed earlier would require significant improvements in the availability and/or cost of near-zero- and zero-emission technologies, as well as potential increased reductions from ongoing State and federal legislative actions that are currently unknown. Progress toward meeting future targets that could be set by the State would be part of the ongoing monitoring and updates to the CAP Update as new legislation or future updates to the State's Climate Change Scoping Plan are adopted.

Figure 3 shows the GHG reductions achieved by the proposed measures, organized by the sectors used for the inventories and forecasts (note: the nonresidential and residential building energy sectors have been combined, as have the water supply and wastewater treatment sectors). The chart shows the estimated GHG reductions due to carbon sequestered through measure MI-1.1 as a dashed line that is not associated with any particular emissions sector. Figure 3 shows the City's achievement of the 2030 target with the proposed GHG reduction measures and demonstrates progress toward the 2045 carbon neutrality target.

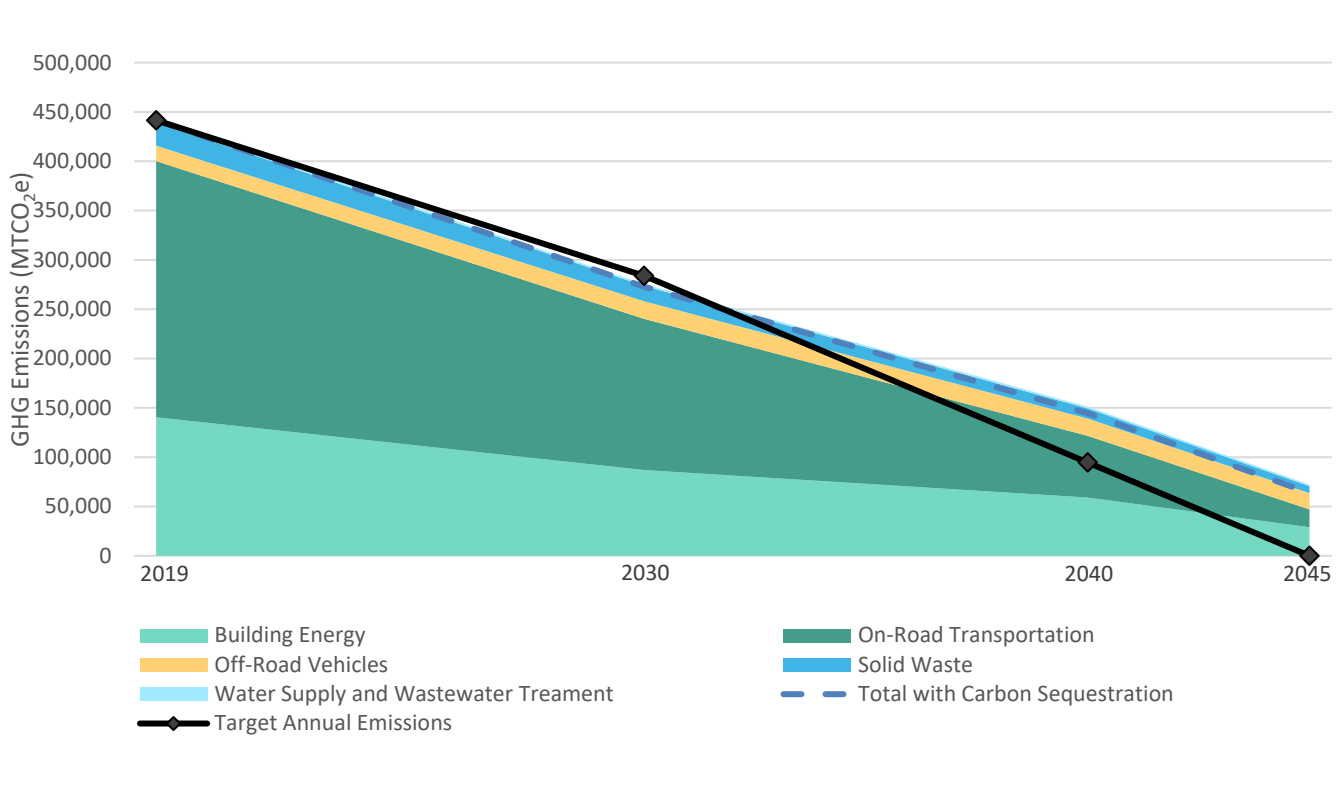

Figure 3 City of Milpitas Community Legislative-Adjusted BAU Emissions Forecast by Sector with Implementation of Proposed GHG Reduction Measures and Emissions Reduction Targets: 2030, 2040 and 2045

4.2 MUNICIPAL OPERATIONS GREENHOUSE GAS EMISSIONS REDUCTION MEASURES

As discussed above, additional GHG reductions are needed to achieve the municipal operations emissions reduction targets for 2030, 2040, and 2045. Ascent worked with City staff to develop a draft list of recommended GHG reduction measures based on policies and goals identified in the 2020 General Plan and other City sustainability planning efforts, as well as new measures informed by current best practices.

The measures presented below are organized under five categories that generally align with the emissions sectors included in Table 2: buildings and public lighting (i.e., buildings and facilities and streetlights and traffic signals), employee commute, vehicle fleet, solid waste, and water. The framework for this section is the same as Section 3.1; at least one strategy and measure are provided for each emissions category, and measures include quantified GHG emissions reductions (where feasible), performance indicator metrics, and identified co-benefits. Actions and supporting activities for municipal operations measures will also be included in the CAP Update document.

Preliminary estimates of GHG emissions reductions, along with an estimated emissions gap are summarized in Table 8 below and illustrated in Figure 4 in Section 3.2.6. Descriptions of the measures are provided in the following sections. Detailed measure calculations and assumptions supporting the GHG reduction estimates are provided in Attachment B.

Table 8 Municipal Operations GHG Emissions Reduction Measures

Measure Number	Strategy	Measure	GHG Reductions ($MTCO_2e$)		
			2030	2040	2045
Buildings and Public Lighting					
ME-1.1	Energy Efficiency and Conservation	Reduce lighting-related energy consumption.	2	1	0
ME-1.2		Increase energy efficiency.	<1	<1	0
ME-1.3		Implement conservation best practices to reduce energy use.	NA	NA	NA
ME-2.1	Electrification	Transition municipal buildings and facilities to be all-electric.	351	707	878
ME-3.1	Clean Energy	Continue to use SVCE-supplied 100 percent carbon-free electricity.	NA	NA	NA
ME-3.2		Transition to 100 percent clean energy for municipal operations.	NA	NA	NA
		Buildings and Public Lighting Subtotal	*353*	*707*	*878*
Employee Commute					
MEC-1.1	Sustainable Employee Commutes	Reduce employee commute VMT and support low-carbon alternatives.	406	576	769
		Employee Commute Subtotal	*406*	*576*	*769*
Vehicle Fleet					
MVF-1.1	Low- and Zero-Emission Fleet Vehicles and Equipment	Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel, by 2030.	924	840	830
		Vehicle Fleet Subtotal	*924*	*840*	*830*
Solid Waste					
MSW-1.1	Zero Waste	Increase waste diversion and achieve zero waste by 2030.	20	35	43
MSW-2.1	Responsible Consumption	Implement an environmentally preferable purchasing policy.	NA	NA	NA
		Solid Waste Subtotal	*20*	*35*	*43*
Water					
MWA-1.1	Water Efficiency and Conservation	Reduce municipal water consumption.	1	<1	0
		Water Subtotal	*1*	*<1*	*0*
Total Reductions from Measures			**1,703**	**2,158**	**2,520**
Reduction Needed to Meet Target			841	2,090	2,759
Target Met?			Yes	Yes	No
Remaining Gap to Target			(862)	(68)	239

Notes: Total may not sum exactly due to independent rounding. GHG = greenhouse gas; $MTCO_2e$ = metric tons of carbon dioxide equivalent; NA = not applicable; SVCE = Silicon Valley Clean Energy; VMT = vehicle miles traveled.

Parentheses indicate target has been met with a surplus of reductions.

Source: Calculations conducted by Ascent Environmental in 2021.

4.2.1 Buildings and Public Lighting

ENERGY EFFICIENCY AND CONSERVATION

Measure ME-1.1: Reduce lighting-related energy consumption.

Quantification assumptions: This measure assumes that the City implements a variety of lighting upgrades to interior and exterior lighting at municipal facilities, streetlights, sports fields, and parks by 2030. The measure assumes annual electricity savings of 3,110 megawatt-hours (MWh) in 2030, 3,368 MWh in 2040, and 3,410 MWh in 2045 (ENGIE 2020).

Co-benefits: cost savings, economic development, plan consistency

Measure ME-1.2: Increase energy efficiency.

Quantification assumptions: This measure assumes that the City implements energy efficiency upgrades to heating, ventilation, and air conditioning systems and installs high-efficiency transformers. The measures assumes annual electricity savings of 135 MWh in 2030, 137 MWh in 2040, and 139 MWh in 2045 (ENGIE 2020).

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

Measure ME-1.3: Implement conservation best practices to reduce energy use.

Quantification assumptions: Not quantified

Co-benefits: local air quality, public health, resilience, cost savings, economic development, water security, plan consistency

ELECTRIFICATION

Measure ME-2.1: Transition municipal buildings and facilities to be all-electric.

Quantification assumptions: This measure assumes that all new municipal development is all-electric by 2030. It assumes that 40 percent of existing municipal buildings and facilities are retrofitted to all-electric by 2030, 80 percent by 2040, and 100 percent by 2045. This measure also assumes 60 percent of existing diesel backup generators are retrofitted to all-electric alternatives by 2030 and 100 percent by 2040.

Co-benefits: local air quality, public health, cost savings, economic development, plan consistency

CLEAN ENERGY

Measure ME-3.1: Continue to use SVCE-supplied 100 percent carbon-free electricity.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, cost savings, plan consistency

Measure ME-3.2: Transition to 100 percent clean energy for municipal operations.

Quantification assumptions: Quantified in combination with Measures ME-2.1 and MVF-1.1.

Co-benefits: local air quality, public health, cost savings, economic development, water security, natural environment and biodiversity, plan consistency

4.2.2 Employee Commute

SUSTAINABLE EMPLOYEE COMMUTES

Measure MEC-1.1: Reduce employee commute VMT and support low-carbon alternatives.

Quantification assumptions: This measure assumes that the City implements a variety of initiatives to reduce employee commute emissions by 40 percent by 2030, 60 percent by 2040, and 80 percent by 2045.

Co-benefits: local air quality, public health, cost savings, transportation options

4.2.3 Vehicle Fleet

LOW- AND ZERO-EMISSION FLEET VEHICLES AND EQUIPMENT

Measure MVF-1.1: Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.

Quantification assumptions: This measure assumes that 100 percent of the City's on-road vehicle fleet is converted to all-electric or other zero-emission alternatives by 2030. The measure assumes 70 percent of off-road vehicles and equipment are converted by 2030, 85 percent are converted by 2040, and 100 percent are converted by 2045.

Co-benefits: local air quality, public health, cost savings, plan consistency

Measure MVF-1.2: Reduce vehicle idling at City facilities.

Quantification assumptions: Not quantified.

Co-benefits: local air quality, public health, cost savings

4.2.4 Solid Waste

ZERO WASTE

Measure MSW-1.1: Increase waste diversion and achieve zero waste by 2030.

Quantification assumptions: This measure assumes that the City's municipal operations waste diversion rate was 60 percent in 2019. It assumes a diversion rate of 75 percent in 2030, 85 percent in 2040, and 90 percent in 2045.

Co-benefits: local air quality, public health, cost savings

Measure MSW-1.2: Implement an environmentally preferable purchasing policy.

Quantification assumptions: Not quantified.

Co-benefits: plan consistency

4.2.5 Water

WATER EFFICIENCY AND CONSERVATION

Measure MWA-1.1: Reduce municipal water consumption.

Quantification assumptions: This measure assumes that upgrades to water fixtures and meters result in water savings of 5 million gallons (MG) in 2030, 5 MG in 2040, and 5 MG in 2045 (ENGIE 2020).

Co-benefits: resilience, cost savings, water security, plan consistency

4.2.6 Municipal Conclusion

The total estimated GHG emissions reductions from all municipal operations measures quantified would be 1,703 $MTCO_2e$ in 2030; 2,158 $MTCO_2e$ in 2040; and 2,520 $MTCO_2e$ in 2045. This would result in total municipal operations GHG emissions of 1,210 $MTCO_2e$ in 2030; 615 $MTCO_2e$ in 2040; and 239 $MTCO_2e$ in 2045. Therefore, the total estimated reductions from all proposed municipal operations GHG reduction measures would be sufficient to meet the 2030 and 2040 targets of 2,081 $MTCO_2e$ and 683 $MTCO_2e$, respectively.

The scale of reductions required to achieve the carbon neutrality target for 2045 would require some improvements in the availability and/or cost of near-zero- and zero-emission technologies, as well as potential increased reductions from ongoing State and federal legislative actions that are currently unknown. Progress toward meeting future targets that could be set by the State would be part of the ongoing monitoring and updates to the CAP Update as new legislation or future updates to the State's Climate Change Scoping Plan are adopted.

Figure 4 shows the GHG reductions achieved by the proposed measures, organized by the same sectors used for the measures. Figure 4 shows the City's achievement 2030 and 2040 targets with the proposed GHG reduction measures and demonstrates progress toward the 2045 carbon neutrality target.

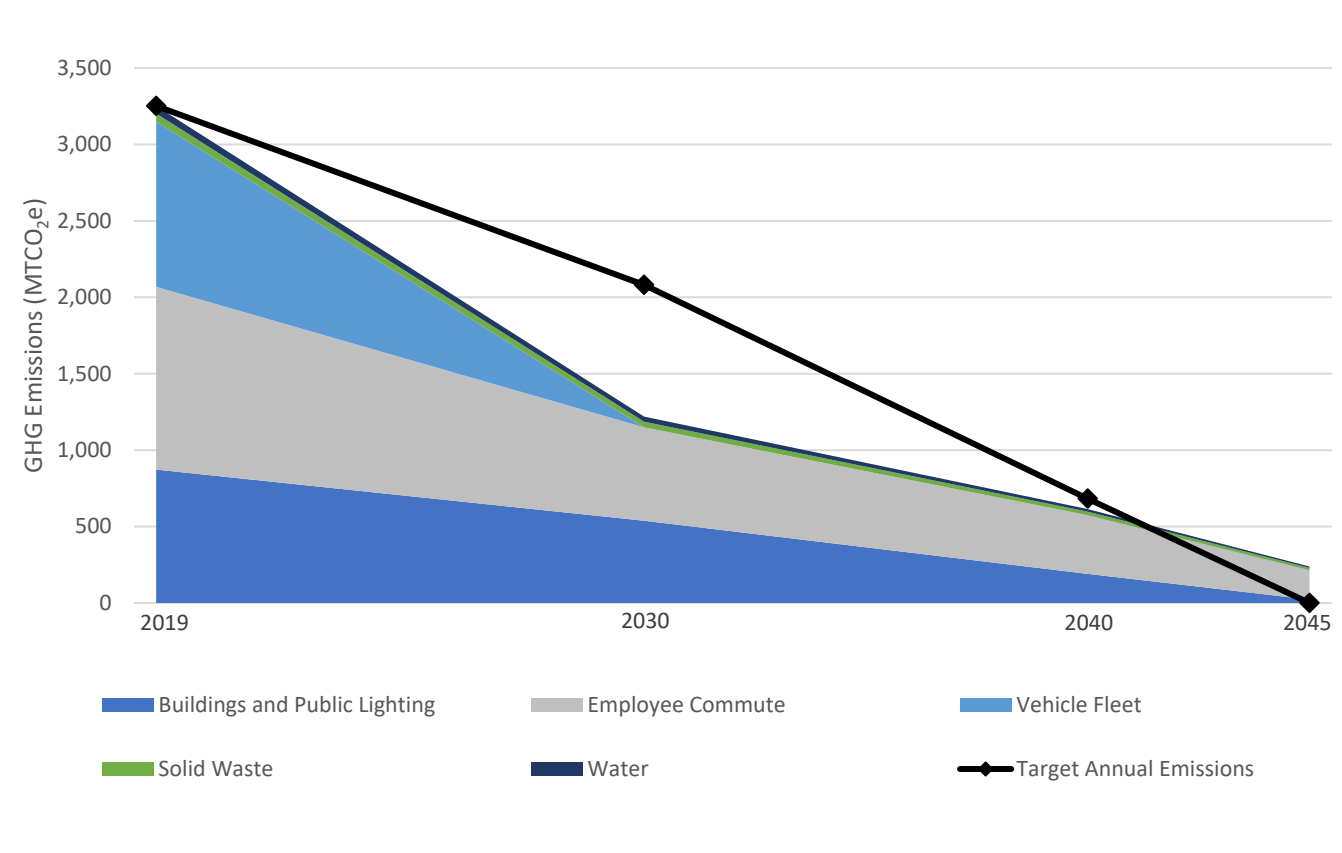

Figure 4 City of Milpitas Municipal Operations Legislative-Adjusted BAU Emissions Forecast by Sector with Implementation of Proposed GHG Reduction Measures and Emissions Reduction Targets: 2030, 2040 and 2045

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Attachment A

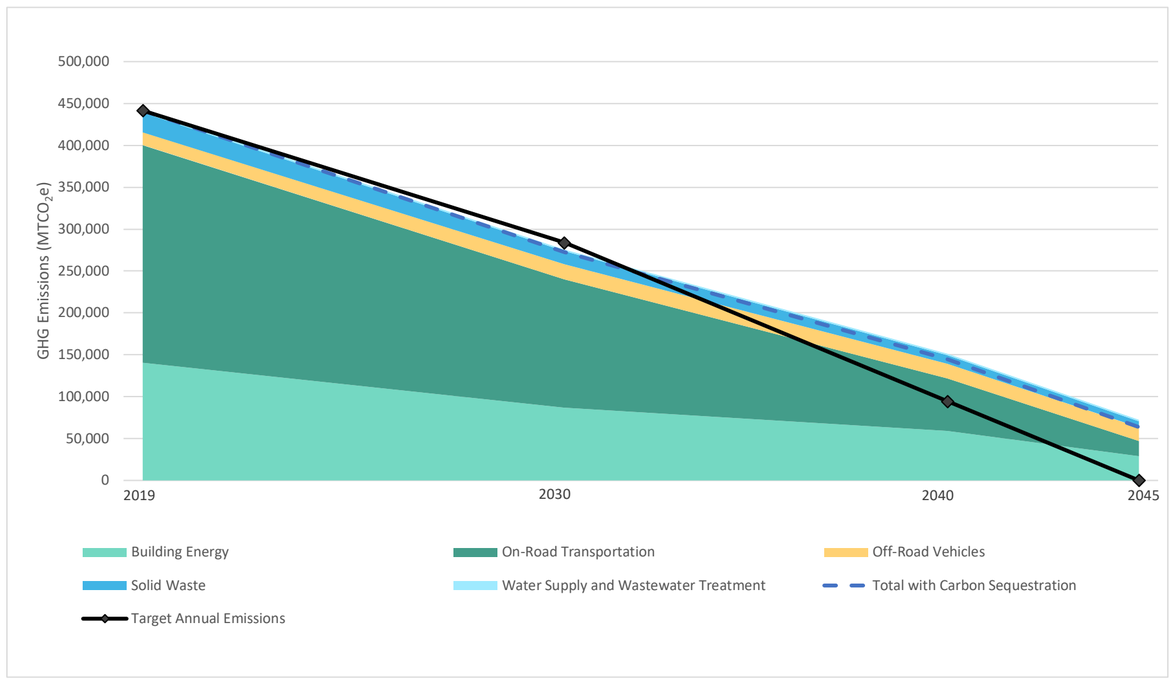
GHG Reduction Measure Calculations

Measure Number	Measure Title	2030	2040	2045
	Building Energy			
BE-1.1	Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	NA	NA	NA
BE-1.2	Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.	13,596	29,050	41,637
BE-1.3	Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.	8,515	21,867	41,308
BE-1.4	Reduce plug loads in existing buildings.	NA	NA	NA
BE-2.1	Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	4,445	7,005	8,945
BE-2.2	Facilitate all-electric development projects for industrial buildings.	NA	NA	NA
BE-2.3	Expand the City's Green Building Program.	NA	NA	NA
BE-3.1	Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	22,581	8,691	-
BE-3.2	Develop innovative approaches to energy generation, distribution, and storage.	NA	NA	NA
BE-3.3	Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	NA	NA	NA
	On-Road Transportation			
TR-1.1	Reduce VMT from new development in compliance with the City's requirements for Senate Bill 743.	3,852	7,029	10,714
TR-1.2	Increase high-density, transit-oriented development that limits sprawl.	7,496	6,626	6,350
TR-1.3	Create car-free commercial districts.	NA	NA	NA
TR-2.1	Increase electric vehicle (EV) charging infrastructure.			
TR-2.2	Increase EV and low-carbon vehicle adoption.			
TR-2.3	Reduce fossil fuel vehicles.	47,065	115,567	156,570
TR-2.4	Increase low- and zero-emission fleet vehicles.			
TR-3.1	Enhance and expand transit facilities and infrastructure.			
TR-3.2	Increase transit ridership.	14,418	16,124	18,852
TR-4.1	Improve active transportation options.	55	99	128
TR-5.1	Increase implementation of transportation demand management (TDM) strategies.			
TR-5.2	Reduce VMT from businesses.	10,191	10,836	10,700
TR-6.1	Reduce vehicle idling.	NA	NA	NA
TR-7.1	Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	NA	NA	NA
	Off-Road Vehicles and Equipment			
OT-1.1	Reduce landscaping-related emissions.	962	1,681	1,759
OT-1.2	Reduce construction-related emissions.	2,361	3,746	5,176
	Solid Waste			
SW-1.1	Eliminate the disposal of organic solid waste in landfills.			
SW-1.2	Increase recycling and the diversion of other inorganic solid waste.			
SW-1.3	Reduce the generation of waste from residents and businesses.	9,385	17,010	21,055
SW-1.4	Reduce the generation of construction and demolition waste.			
SW-1.5	Facilitate repair and reuse of consumer products.			
SW-2.1	Dispose waste at innovative facilities.	NA	NA	NA
SW-2.2	Support waste-to-energy facilities.	NA	NA	NA
SW-3.1	Engage with waste-related policymaking.	NA	NA	NA
	Water and Wastewater			
WA-1.1	Reduce indoor water consumption in buildings.	85	39	0
WA-1.2	Reduce water consumption for irrigation and landscaping.	59	28	0
WA-2.1	Increase the use of recycled water.	NA	NA	NA
WA-3.1	Generate biogas at wastewater treatment plants.	NA	NA	NA
	Miscellaneous			
MI-1.1	Protect native trees and vegetation and enhance carbon sequestration.	2,632	6,601	8,586
MI-2.1	Reduce the urban heat island effect to conserve energy.	NA	NA	NA
MI-3.1	Increase the use of green infrastructure.	NA	NA	NA
MI-4.1	Incentivize and promote green business practices.	NA	NA	NA
MI-4.2	Support green jobs in the city.	NA	NA	NA
MI-5.1	Increase soil carbon content.	NA	NA	NA
MI-5.2	Use low-carbon and carbon sequestering construction materials in new development.	NA	NA	NA

Total Reductions from Measures	147,697	251,999	331,780
Reduction Needed for Target	136,819	302,023	395,432
Gap Needed to Achieve Target*	(10,878)	50,024	63,651
	**negative numbers mean target has been achieved; positive values means there is a gap*		
Legislative-Adjusted BAU Emissions	420,636	396,629	395,432
Legislative-Adjusted BAU Emissions - Reductions from Measures	272,938	144,629	63,651
Total Target Emissions	283,817	94,606	-

Reductions by Sector	**2030**	**2040**	**2045**
Building Energy	49,138	66,613	91,890
On-Road	83,076	156,282	203,314
Off-Road	3,324	5,427	6,935
Solid Waste	9,385	17,010	21,055
Water & Wastewater	144	67	0
Miscellaneous	2,632	6,601	8,586
Total	147,697	251,999	331,780

Emissions with Measures Applied	**2019**	**2030**	**2040**	**2045**
Building Energy	140,537	86,990	59,073	28,946
On-Road Transportation	259,627	153,234	62,617	18,073
Off-Road Vehicles	15,554	17,815	17,557	16,486
Solid Waste	23,566	15,641	10,206	7,018
Water Supply and Wastewater Treatment	2,272	1,889	1,778	1,713
Total	441,557	275,477	151,187	72,237
Carbon Sequestration (Reduction)	-	2,632	6,601	8,586
Total with Carbon Sequestration	441,557	272,938	144,629	63,651
Target Annual Emissions	441,557	283,817	94,606	-
Axis	-	-	-	-



Measure Number	Measure Title	2030	2040	2045
BE-1.1	Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	NA	NA	NA
BE-1.2	Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.	13,596	29,050	41,637
BE-1.3	Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.	8,515	21,867	41,308
BE-1.4	Reduce plug loads in existing buildings.	NA	NA	NA
BE-2.1	Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	4,445	7,005	8,945
BE-2.2	Facilitate all-electric development projects for industrial buildings.	NA	NA	NA
BE-2.3	Expand the City's Green Building Program.	NA	NA	NA
BE-3.1	Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	22,581	8,691	-
BE-3.2	Develop innovative approaches to energy generation, distribution, and storage.	NA	NA	NA
BE-3.3	Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	NA	NA	NA
TR-1.1	Reduce VMT from new development in compliance with the City's requirements for Senate Bill 743.	3,852	7,029	10,714
TR-1.2	Increase high-density, transit-oriented development that limits sprawl.	7,496	6,626	6,350
TR-1.3	Create car-free commercial districts.	NA	NA	NA
TR-2.1	Increase electric vehicle (EV) charging infrastructure.			
TR-2.2	Increase EV and low-carbon vehicle adoption.	47,065	115,567	156,570
TR-2.3	Reduce fossil fuel vehicles.			
TR-2.4	Increase low- and zero-emission fleet vehicles.			
TR-3.1	Enhance and expand transit facilities and infrastructure.	14,418	16,124	18,852
TR-3.2	Increase transit ridership.			
TR-4.1	Improve active transportation options.	55	99	128
TR-5.1	Increase implementation of transportation demand management (TDM) strategies.	10,191	10,836	10,700
TR-5.2	Reduce VMT from businesses.			
TR-6.1	Reduce vehicle idling.	NA	NA	NA
TR-7.1	Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	NA	NA	NA
OT-1.1	Reduce landscaping-related emissions.	962	1,681	1,759
OT-1.2	Reduce construction-related emissions.	2,361	3,746	5,176
SW-1.1	Eliminate the disposal of organic solid waste in landfills.			
SW-1.2	Increase recycling and the diversion of other inorganic solid waste.			
SW-1.3	Reduce the generation of waste from residents and businesses.	9,385	17,010	21,055
SW-1.4	Reduce the generation of construction and demolition waste.			
SW-1.5	Facilitate repair and reuse of consumer products.			
SW-2.1	Dispose waste at innovative facilities.	NA	NA	NA
SW-2.2	Support waste-to-energy facilities.	NA	NA	NA
SW-3.1	Engage with waste-related policymaking.	NA	NA	NA
WA-1.1	Reduce indoor water consumption in buildings.	85	39	0
WA-1.2	Reduce water consumption for irrigation and landscaping.	59	28	0
WA-2.1	Increase the use of recycled water.	NA	NA	NA
WA-3.1	Generate biogas at wastewater treatment plants.	NA	NA	NA
MI-1.1	Protect native trees and vegetation and enhance carbon sequestration.	2,632	6,601	8,586
MI-2.1	Reduce the urban heat island effect to conserve energy.	NA	NA	NA
MI-3.1	Increase the use of green infrastructure.	NA	NA	NA
MI-4.1	Incentivize and promote green business practices.	NA	NA	NA
MI-4.2	Support green jobs in the city.	NA	NA	NA
MI-5.1	Increase soil carbon content.	NA	NA	NA
MI-5.2	Use low-carbon and carbon sequestering construction materials in new development.	NA	NA	NA

Total Reductions from Measures	147,697	251,999	331,780
Reduction Needed for Target	136,819	302,023	395,432
Gap Needed to Achieve Target*	(10,878)	50,024	63,651
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Legislative-Adjusted BAU Emissions - Reductions from Measures	272,983	144,629	63,651
Total Target Emissions	283,817	94,606	-

Reductions by Sector	**2030**	**2040**	**2045**
Building Energy	49,138	66,613	91,890
On-Road	83,076	156,282	203,314
Off-Road	3,324	5,427	6,935
Solid Waste	9,385	17,010	21,055
Water & Wastewater	144	67	0
Miscellaneous	2632	6601	8586
Total	147,697	251,999	331,780

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach
Energy Efficiency and Electrification	BE-1.1	Existing	Residential and Nonresidential	Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	NA	NA	NA	Not quantifiable.
	BE-1.2	Existing	Residential	Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.	13,596	29,050	41,637	Assumes 36% of existing residential development will be all-electric by 2030, 72% by 2040, and 100% by 2045.
	BE-1.3	Existing	Nonresidential	Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.	8,515	21,867	41,308	Assumes 13% of existing nonresidential development will be all-electric by 2030, 36% by 2040, and 60% by 2045.
	BE-1.4	Existing	Residential	Reduce plug loads in existing buildings.	NA	NA	NA	Not quantifiable.
Low Carbon Development	BE-2.1	New	Residential and Nonresidential	Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	4,445	7,005	8,945	Assumes all-electric requirement for residential and nonresidential development in 2022 code.
	BE-2.2	New	Nonresidential	Facilitate all-electric development projects for industrial buildings.	NA	NA	NA	Not quantifiable.
	BE-2.3	New	Residential and Nonresidential	Expand the City's Green Building Program.	NA	NA	NA	Not quantifiable.
Clean Energy	BE-3.1	New and Existing	Residential and Nonresidential	Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	22,581	8,691	-	Assumes 100% participation communitywide with carbon-free electricity by 2030.
	BE-3.2	New and Existing	Residential and Nonresidential	Develop innovative approaches to energy generation, distribution, and storage.	NA	NA	NA	Not quantifiable.
	BE-3.3	New and Existing	Residential and Nonresidential	Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	NA	NA	NA	Not quantifiable.
				Total	49,138	66,613	91,890	

BE-1.2				
Retrofit existing residential buildings to improve energy efficiency and facilitate fuel switching.	**2019**	**2030**	**2040**	**2045**
Removal of natural gas in existing residential buildings				
Existing residential buildings natural gas usage (therms)	7,840,602	7,840,602	7,840,602	7,840,602
Target electrification rate for existing residential buildings (natural gas) [1]		36%	72%	100%
Reduced natural gas usage (therms)		2,822,617	5,645,233	7,840,602
Natural gas emissions factor (MTCO2e/therm)		0.005310456	0.005310456	0.005310456
GHG reductions from existing development natural gas savings (MTCO2e)		14,989	29,979	41,637
Additional electricity use and emissions				
Assumed average efficiency of natural gas heating (conservative) [2]	78%			
Assumed average efficiency of electric heating [3]	100%			
kWh per therm conversion	29.3001			
Total therms offset from natural gas heating use (therms)		2,822,617	5,645,233	7,840,602
Total electricity needed to offset natural gas heating (MWh)		64,508	129,017	179,190
Electricity emissions factor (MTCO2e/MWh)		0.02161	0.007202	0
Additional GHG emissions from electricity use (MTCO2e)		1,394	929	-
GHG Reductions from BE-1.2 (MTCO2e)		13,596	29,050	41,637

Sources:

[1] Mozingo. 2021. Zero-Carbon Buildings in California: A Feasibility Study

[2] Energy Solutions Center. 2021. Natural Gas Furnaces. Available: https://naturalgasefficiency.org/for-residential-customers/heat-gas_furnace/#:~:text=All%20furnaces%20built%20and%20sold,furnace%20with%20standing%20pilot%20%E2%80%93%2050%25

[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.

BE-1.3 **Retrofit existing nonresidential buildings to improve energy efficiency and facilitate fuel switching.**	**2019**	**2030**	**2040**	**2045**
Removal of natural gas in existing non-residential buildings				
Existing nonresidential buildings natural gas usage (therms)	12,772,616	12,772,616	12,772,616	12,772,616
Target electrification rate for existing nonresidential buildings (natural gas) [1]		13%	32%	60%
Reduced natural gas usage (therms)		1,660,440	4,087,237	7,663,570
Natural gas emissions factor (MTCO2e/therm)		0.005310456	0.005310456	0.005310456
GHG reductions from existing nonresidential natural gas savings (MTCO2e)		8,818	21,705	40,697
Additional electricity use and emissions				
Assumed average efficiency of natural gas heating (conservative) [2]	78%			
Assumed average efficiency of electric heating [3]	150%			
kWh per therm conversion	29.3001			
Total therms offset from natural gas heating use (therms)		1,660,440	4,087,237	7,663,570
Total electricity needed to offset natural gas heating (MWh)		25,299	62,273	116,763
Electricity emissions factor (MTCO2e/MWh)		0.02161	0.007202	0
Additional GHG emissions from electricity use (MTCO2e)		547	448	-
Elimination of fossil fuel backup generators				
Existing backup generator natural gas usage (therms)	2,292	2,292	2,292	2,292
Existing backup generator diesel usage (gallons)	58,522	58,522	58,522	58,522
Target elimination rate for backup generators		40%	100%	100%
Reduced natural gas use from elimination of backup generator permits by 2030 (therms)		917	2,292	2,292
Reduced diesel use from elimination of backup generator permits by 2030 (gallons)		23,409	58,522	58,522
Backup generator natural gas emissions factor (MTCO2e/therm)		0.005276123	0.005276123	0.005276123
Backup generator diesel emissions factor (MTCO2e/gallon)		0.010228012	0.010228012	0.010228012
GHG reductions from backup generator natural gas savings (MTCO2e)		5	12	12
GHG reductions from backup generator diesel savings (MTCO2e)		239	599	599
Summary				
GHG reductions from existing development natural gas savings (MTCO2e)		8,818	21,705	40,697
Additional GHG emissions from electricity use (MTCO2e)		(547)	(448)	-
GHG reductions from backup generator natural gas savings (MTCO2e)		5	12	12
GHG reductions from backup generator diesel savings (MTCO2e)		239	599	599
GHG Reductions from BE-1.3 (MTCO2e)		8,515	21,867	41,308

Sources:

[1] Mozingo. 2021. Zero-Carbon Buildings in California: A Feasibility Study

[2] Energy Solutions Center. 2021. Natural Gas Furnaces. Available: https://naturalgasefficiency.org/for-residential-customers/heat-gas_furnace/#:~:text=All%20furnaces%20built%20and%20sold,furnace%20with%20standing%20pilot%20%E2%80%93%2050%25

[3] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.

BE-2.1					
Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	**2019**	**2022**	**2030**	**2040**	**2045**
All-electric new development					
Annual residential natural gas usage with legislative reductions (therms)	7,840,602	7,874,209	7,963,827	8,148,719	8,221,218
New natural gas usage (therms)		33,607	123,225	308,118	380,616
Reduced residential natural gas usage from all-electric new residential development starting in 2023 (therms)			89,618	274,511	347,009
Annual nonresidential natural gas usage with legislative reductions (therms)	12,772,616	13,080,882	13,902,926	14,154,850	14,403,617
New nonresidential natural gas usage (therms)		308,266	1,130,310	1,382,234	1,631,001
Reduced nonresidential natural gas usage from all-electric new nonresidential development starting in 2023 (therms)			822,044	1,073,968	1,322,735
Total reduced natural gas usage in new development (therms)			911,662	1,348,479	1,669,744
Natural gas emissions factor (MTCO2e/therm)			0.005310456	0.005310456	0.005310456
GHG reductions from new development natural gas savings (MTCO2e)			4,841	7,161	8,867
Additional electricity use and emissions					
Assumed average efficiency of natural gas heating (conservative) [1]	78%				
Assumed average efficiency of electric heating [2]	100%				
kWh per therm conversion	29.3001				
Therms offset from natural gas heating use (therms)			911,662	1,348,479	1,669,744
Electricity needed to offset natural gas heating (MWh)			20,835	30,818	38,160
Electricity emissions factor (MTCO2e/MWh)			0.021606088	0.007202029	0
Additional GHG emissions from electricity use (MTCO2e)			450	222	-
Prohibiting fossil fuel backup generators in new nonresidential development by 2030					
Annual backup generator natural gas usage with legislative reductions (therms)	2,292		2,495	2,540	2,585
Annual backup generator diesel usage with legislative reductions (gallons)	58,522		63,701	64,855	65,995
New backup generator natural gas usage (therms)			203	248	293
New backup generator diesel usage (gallons)			5,179	6,333	7,473
Reduced natural gas use from prohibiting fossil fuel backup generators in new nonresidential development by 2030 (therms)			203	248	293
Reduced diesel use from prohibiting fossil fuel backup generators in new development by 2030 (gallons)			5,179	6,333	7,473
Backup generator natural gas emissions factor (MTCO2e/therm)			0.005276123	0.005276123	0.005276123
Backup generator diesel emissions factor (MTCO2e/gallon)			0.010228012	0.010228012	0.010228012
GHG reductions from new backup generator natural gas savings (MTCO2e)			1	1	2
GHG reductions from new backup generator diesel savings (MTCO2e)			53	65	76
Summary					
GHG reductions from new development natural gas savings (MTCO2e)			4,841	7,161	8,867
Additional GHG emissions from electricity use (MTCO2e)			(450)	(222)	-
GHG reductions from backup generator natural gas savings (MTCO2e)			1	1	2
GHG reductions from backup generator diesel savings (MTCO2e)			53	65	76
GHG Reductions from BE-2.1 (MTCO2e)			4,445	7,005	8,945

Sources:

[1] Energy Solutions Center. 2021. Natural Gas Furnaces. Available: https://naturalgasefficiency.org/for-residential-customers/heat-gas_furnace/#:~:text=All%20furnaces%20built%20and%20sold,furnace%20with%20standing%20pilot%20%E2%80%93%2050%25

[2] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.

BE-3.1					
Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.		**2019**	**2030**	**2040**	**2045**
Total electricity emissions (MTCO2e)			19,342	6,569	0
Additional electricity emissions from other measures (MTCO2e)					
	E-1.2		*1,394*	*929*	*0*
	E-1.3		*547*	*448*	*0*
	E-2.1		*450*	*222*	*0*
	T-2.1		*811*	*502*	*0*
	O-1.1		*38*	*21*	*0*
	Total		*3,240*	*2,123*	*0*
Adjusted electricity emissions reductions from 100% carbon-free electricity			22,581	8,691	0
GHG Reductions from BE-3.1 (MTCO2e)			22,581	8,691	-

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach
Sustainable Transportation and Land Use Planning	TR-1.1	New	On-Road Transportation	Reduce VMT from new development in compliance with the City's requirements for Senate Bill 743.	3,852	7,029	10,714	Assumes a 15% reduction in total new VMT in 2030, 20% in 2040, and 25% in 2045.
	TR-1.2	New and Existing	On-Road Transportation	Increase high-density, transit-oriented development that limits sprawl.	7,496	6,626	6,350	Assumes a 3.3% reduction in VMT from mixed-used, transit-oriented development and a 3.2% reduction from complete streets and neighborhoods.
	TR-1.3	New and Existing	On-Road Transportation	Create car-free commercial districts.	NA	NA	NA	Not quantifiable.
Low- and Zero-Emission Vehicles	TR-2.1	New and Existing	On-Road Transportation	Increase electric vehicle (EV) charging infrastructure.	47,065	115,567	156,570	Measures 2.1 to 2.4 combined. New EV methodology based on state targets and existing conditions for EVs in the city.
	TR-2.2	New	On-Road Transportation	Increase EV and low-carbon vehicle adoption.				
	TR-2.3	New and Existing	On-Road Transportation	Reduce fossil fuel vehicles.				
	TR-2.4	New and Existing	On-Road Transportation	Increase low- and zero-emission fleet vehicles.				
Transit System Improvements	TR-3.1	New and Existing	On-Road Transportation	Enhance and expand transit facilities and infrastructure.	14,418	16,124	18,852	Assumes a 10.3% reduction in existing VMT in 2030, a 12.5% reduction in 2040, and a 14.8% reduction in 2045.
	TR-3.2	New and Existing	On-Road Transportation	Increase transit ridership.				
Active Transportation	TR-4.1	New and Existing	On-Road Transportation	Improve active transportation options.	55	99	128	
Transportation Demand Management	TR-5.1		On-Road Transportation	Increase implementation of transportation demand management (TDM) strategies.	10,191	10,836	10,700	Assumes a 15% reduction in VMT in 2030, a 25% reduction in 2040, and a 30% reduction in 2045. Combined with TR-5.2
	TR-5.2	New and Existing	On-Road Transportation	Reduce VMT from businesses.				Combined with TR-5.1
Vehicle Idling	TR-6.1	New and Existing	On-Road Transportation	Reduce vehicle idling.	NA	NA	NA	Not quantifiable.
Parking	TR-7.1	New and Existing	On-Road Transportation	Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	NA	NA	NA	Not quantifiable.
				Total	83,076	156,282	203,314	

TR-1.1				
Reduce VMT from new development in compliance with the City's requirements for Senate Bill 743.	**2019**	**2030**	**2040**	**2045**
Annual passenger vehicle miles traveled (VMT)	509,968,096	559,587,179	579,143,509	599,858,891
New passenger VMT		49,619,084	69,175,414	89,890,795
Percent VMT reduction from SB 743		15%	20%	25%
Reduced passenger VMT from SB 743		7,442,863	13,835,083	22,472,699
Passenger vehicle emissions factor (MTCO2e/mile)		0.000274487	0.000252949	0.000249778
GHG reductions from passenger vehicles (MTCO2e)		2,043	3,500	5,613
Annual commercial vehicle miles traveled (VMT)	62,921,403	73,664,721	83,202,762	88,017,894
New commercial VMT		10,743,318	20,281,359	25,096,491
Percent VMT reduction from SB 743		15%	20%	25%
Reduced commercial VMT from SB 743		1,611,498	4,056,272	6,274,123
Commercial vehicle emissions factor (MTCO2e/mile)		0.001122798	0.00087022	0.000812973
GHG reductions from commercial vehicles (MTCO2e)		1,809	3,530	5,101
GHG Reductions from TR-1.1 (MTCO2e)		3,852	7,029	10,714

TR-1.2				
Increase high-density, transit-oriented development that limits sprawl.	**2019**	**2030**	**2040**	**2045**
Annual existing passenger vehicle miles traveled (VMT) forecast*	509,968,096	509,968,096	509,968,096	509,968,096
Passenger VMT reductions from other Measures				
T-3.1; T-3.2		52,526,714	63,746,012	75,475,278
T-4.1		199,619	391,254	511,026
T-5.1; T-5.2		37,125,677	42,837,320	42,837,320
Total VMT reductions from other measures		89,852,011	106,974,586	118,823,624
Adjusted existing passenger VMT		420,116,085	402,993,510	391,144,472
Higher density, mixed use development				
Adjusted existing passenger VMT		420,116,085	402,993,510	391,144,472
Percent reduction in VMT [1] [2]		3.3%	3.3%	3.3%
Annual VMT Reduced		13,863,831	13,298,786	12,907,768
Passenger vehicle emissions factor (MTCO2e/mile)		0.000274487	0.000252949	0.000249778
GHG reductions from higher density, mixed use development (MTCO2e)		3,805	3,364	3,224
Complete streets and neighborhoods				
Adjusted existing passenger VMT		420,116,085	402,993,510	391,144,472
Percent reduction in VMT per CAPCOA T-17		3.2%	3.2%	3.2%
Annual VMT reduced		13,443,715	12,895,792	12,516,623
Passenger vehicle emissions factor (MTCO2e/mile)		0.000274487	0.000252949	0.000249778
GHG reductions from complete streets and neighborhoods (MTCO2e)		3,690	3,262	3,126
GHG Reductions from TR-1.2 (MTCO2e)		7,496	6,626	6,350

Sources:

[1] Mazing. 2021. Zero-Carbon Buildings in California: A Feasibility Study *0.4% to 7.7%*

[2] CAPCOA T-17 *3.20%*

* VMT reductions are only quantified for existing VMT because Measure T-SB 743 addresses all new VMT

T-2.1 to T-2.4				
Low- and Zero-Emission Vehicles	**2019**	**2030**	**2040**	**2045**
State-level EV Forecasts and Targets				
Statewide Light Duty Population [1]	21,740,485	22,517,421	23,785,035	24,319,224
Statewide Light Duty EV population [1]	301,208	1,293,127	1,915,316	2,061,762
Statewide EV Population Target under EO N-79-20 (5 million baseline scenario, 8 million high scenario) [2]		8,000,000	14,000,000	20,671,341
Target Percent EVs in Passenger Vehicles		**36%**	**59%**	**85%**
Target Percent EVs in Passenger Vehicles for Milpitas		36%	59%	85%
EMFAC 2021 Forecasts				
Light Duty eVMT in Santa Clara County [1]		3,836,710	4,508,768	4,706,110
Light Duty VMT in Santa Clara County [1]		38,943,557	41,349,174	42,592,559
Percent eVMT in Santa Clara County		**10%**	**11%**	**11%**
Forecasted eVMT in Milpitas				
Milpitas Passenger VMT after Measures		434,984,761	432,139,262	433,138,177
Forecasted eVMT in Milpitas		42,854,592	47,121,025	47,858,027
Target eVMT in Milpitas		154,541,589	254,359,506	368,167,451
Additional eVMT needed to meet State Targets		**111,686,997**	**207,238,481**	**320,309,424**
Additional GHG emissions from EV charger use				
Additional eVMT needed to meet State Targets		111,686,997	207,238,481	320,309,424
Average Efficiency of EV LDV (kWh/100-mi) [3]		34	34	34
Electricity emissions factor (MTCO2e/MWh)		0.02161	0.00720	-
Charged amount (kWh)		37,558,108	69,690,166	107,713,667
Additional GHG emissions from EVs (MTCO2e)		811	502	-
Emissions from Equivalent Gasoline/Diesel Vehicles				
Additional eVMT needed to meet State Targets		111,686,997	207,238,481	320,309,424
Avg emissions factor for non-electric passenger vehicles (MTCO2e/mi)		0.0002745	0.0002529	0.0002498
Equivalent GHG emissions avoided from increased EV chargers (MTCO2e)		30,657	52,421	80,006
GHG Reductions from T-2.1 to T-2.4 (MTCO2e)		29,845	51,919	80,006

Sources:

[1] EMFAC 2021. Statewide light duty EV population. (EMFAC 2021 does not account for statewide targets under EO N-79-20)

[2] Assembly Bill 2127 Electric Vehicle Charging Infrastructure Assessment (Staff Report). January 2021.

[3] https://www.driveclean.ca.gov/pev/Charging.php

TR-3.1; TR-3.2				
Enhance and expand transit facilities and infrastructure. Increase transit ridership.	**2019**	**2030**	**2040**	**2045**
Annual existing passenger vehicle miles traveled (VMT)	509,968,096	509,968,096	509,968,096	509,968,096
Percent reduction in existing citywide passenger VMT from comprehensive expansion of transit network (estimated 5.8% to 14.8%) [1] [2]		10.3%	12.5%	14.8%
Passenger VMT reduction		52,526,714	63,746,012	75,475,278
Passenger vehicle emissions factor (MTCO2e/mi)		0.0002745	0.0002529	0.0002498
GHG reductions from passenger vehicles (MTCO2e)		14,418	16,124	18,852
GHG Reductions from TR-3.1; TR-3.2 (MTCO2e)		14,418	16,124	18,852

Sources:

[1] Mazing. 2021. Zero-Carbon Buildings in California: A Feasibility Study 5.8% to 14.8%

[2] Handy, S. et al. (2013). Impacts of Transit Service Strategies on Passenger Vehicle Use and Greenhouse Gas Emissions - Policy Brief and Technical Background Document. California Air Resources Board. Retrieved from: https://arb.ca.gov/cc/sb375/policies/policies.htm 0.5% to 10.5%

TR-4.1				
Improve active transportation options.	**2019**	**2030**	**2040**	**2045**
New bike lanes in Milpitas				
New bikeway miles proposed in Master Plan [1]		50	70	80
Days per year that new bicycle lanes would be used?		365	365	365
Daily Vehicle Miles of Travel in Milpitas [2]		536,790	536,790	536,790
Maintained Miles in Milpitas [2]		128	128	128
Annual Average Daily Traffic on Parallel Roadways near bike paths (based on average AADT on Milpitas roadways)		1,651	2,311	2,642
Bicycle Adjustment factor [3]		0.0038	0.0038	0.0038
Bicycle Activity Center Credit [3]		0.0015	0.0015	0.0015
Annual Vehicle Trips reduced		3,194	4,471	5,110
Annual VMT Reduced		159,696	313,003	408,821
New pedestrian paths in Milpitas				
New pedestrian path miles		25	35	40
Days per year that new pedestrian paths would be used?		365	365	365
Daily Vehicle Miles of Travel in Milpitas [2]		536,790	536,790	536,790
Maintained Miles in Milpitas [2]		128	128	128
Annual Average Daily Traffic on Parallel Roadways near ped paths (based on average AADT on Milpitas roadways)		826	1,156	1,321
Pedestrian Adjustment Factor [3]		0.0038	0.0038	0.0038
Activity Center Credit		0.0015	0.0015	0.0015
Annual Vehicle Trips reduced		1,597	2,236	2,555
Annual VMT Reduced		39,924	78,251	102,205
Total Annual VMT Reduced		199,619	391,254	511,026
Emissions per mile for passenger vehicles (MTCO2e/mi)		0.00027449	0.00025295	0.00024978
GHG emissions reductions from active transportation (MTCO2e)		55	99	128
GHG Reductions from TR-4.1 (MTCO2e)		55	99	128

< 50 bikeway miles proposed in new Ped/Bike Master Plan. Buildout year for the Plan not provided; assumed 2030 and assumed additional improvements in the future

<--Based on HPMS Data.
<--Conservative adjustment factor based on low AADT
<-- assumed that new lanes would be placed near at least 3 activity centers within a half a mile of facilities

<-- Assume 50% of bike lane/paths are also ped paths.

<--Based on HPMS Data.
<--Conservative adjustment factor based on low AADT
<-- assumed that new lanes would be placed near at least 3 activity centers within a half a mile of facilities

Sources:

[1] https://milpitasplanreview.altaplanning.site/#/

[2] https://dot.ca.gov/-/media/dot-media/programs/research-innovation-system-information/documents/california-public-road-data/prd-2019-a11y.pdf

[3] https://www.tpl.org/sites/default/files/Climate-smart%20Cities%20Methodology%20Active%20Transport%20exec%20summary.pdf

AADT on parallel roadway	Facility Length (mi) >2
12,000	0.0038
24,000	0.0027
3,000	0.0019

Table 6

2019 Maintained Miles & Daily Vehicle Miles of Travel Estimates by Jurisdiction

COUNTY	JURISDICTION	MAINTAINED MILES RURAL	MAINTAINED MILES URBANIZED	MAINTAINED MILES TOTAL	DAILY VEHICLE MILES OF TRAVEL (DVMT) [1,000] RURAL	DAILY VEHICLE MILES OF TRAVEL (DVMT) [1,000] URBANIZED	DAILY VEHICLE MILES OF TRAVEL (DVMT) [1,000] TOTAL
SANTA CLARA							
Cities:	CAMPBELL		90.94	90.94		422.70	422.70
	CUPERTINO		129.00	129.00		479.69	479.69
	GILROY	1.01	110.53	111.54	0.46	297.34	297.80
	LOS ALTOS		115.85	115.85		337.60	337.60
	LOS ALTOS HILLS TOWN		68.97	68.97		118.24	118.24
	LOS GATOS TOWN	0.47	109.63	110.10	0.21	390.95	391.16
	MILPITAS		127.50	127.50		536.79	536.79
	MONTE SERENO		14.34	14.34		23.44	23.44
	MORGAN HILL		119.09	119.09		404.56	404.56
	MOUNTAIN VIEW		140.50	140.50		573.45	573.45
	PALO ALTO	8.16	185.98	194.14	95.10	880.41	975.51
	SAN JOSE	0.84	1,937.41	1,938.25	13.63	7,824.50	7,838.14
	SANTA CLARA		245.79	245.79		1,508.44	1,508.44
	SARATOGA		132.91	132.91		347.89	347.89
	SUNNYVALE		255.23	255.23		1,222.32	1,222.32
Other:	SANTA CLARA COUNTY	290.69	295.45	586.14	286.64	548.38	835.02
	STATE HIGHWAYS	74.09	182.80	256.88	1,517.28	22,138.94	23,656.22
	STATE PARK SERVICE	4.09	0.63	4.72	1.84	0.28	2.13
	U.S. FISH AND WILDLIFE		1.49	1.49		0.67	0.67
	U.S. NAVY/MARINES		11.38	11.38		5.22	5.22
SANTA CLARA TOTAL		379.35	4,275.42	4,654.76	1,915.16	38,061.82	39,976.98

$VT_{B,P}$ = (BIKE x D x AADT x [A + C]) + (PED x D x AADT x [A + C])

Where:

$VT_{B,P}$ = Annual vehicle trips reduced due to bicycling and walking

BIKE = Binary variable indicating whether the project has a bicycle component

PED = Binary variable indicating whether the project has a pedestrian component

D = Number of days per year that people use the facility

AADT = Annual average daily traffic on a parallel roadway

A = Adjustment factor (based on AADT, facility length, and whether the project is located in a university area; see Table 1)

C = Activity center credit (based on the number of activity centers located within a quarter- or half-mile of the project; see Table 2)

2.2.3 REDUCED VMT

The methodology calculates reduced vehicle miles traveled (VMT) by multiplying the number of trips shifted to bicycling, walking, and transit by the average trip lengths for each mode:

$VMT = VT_B * L_B + VT_P * L_P + VT_T * L_T$

Where:

VMT = Annual VMT reduced

VT_B = Annual vehicle trip reductions due to bicycling

L_B = Average length of bicycle trips

VT_P = Annual vehicle trip reductions due to walking

L_P = Average length of pedestrian trips

VT_T = Annual vehicle trip reductions due to transit

L_T = Average length of transit trips

Table 1 and Table 2 summarize the adjustment factors and activity center credits used in the methodology.

TABLE 1: ADJUSTMENT FACTORS (A) BY AADT, FACILITY LENGTH, AND WHETHER THE PROJECT IS LOCATED IN A UNIVERSITY AREA

AADT on parallel roadway	Facility length (mi) <1	1–2	>2
NON-UNIVERSITY AREA			
12,000	0.0019	0.0029	0.0038
24,000	0.0014	0.002	0.0027
30,000	0.001	0.0014	0.0019
UNIVERSITY AREA			
12,000	0.0104	0.0155	0.0207
24,000	0.0073	0.0109	0.0145
30,000	0.0052	0.0078	0.0104

TABLE 2: ACTIVITY CENTER CREDITS (C) BY NUMBER OF ACTIVITY CENTERS AND DISTANCE FROM THE FACILITY

Number of activity centers	Within 1/2 mile of the facility	Within 1/4 mile of the facility
<3	0	0
3	0.0005	0.001
4–6	0.001	0.002
>6	0.0015	0.003

Notes

New Bike/Ped Master Plan:

"The proposed network includes over 50 miles of new low-stress bikeways" - p.8

"<2% of residents walk or bike to work."

Existing Class I bikeway miles: 8

Existing Class II bikeway miles: 25

Existing Class III bikeway miles: 15

Total existing bikeway miles: 48

"For 11 of these schools, the City has designated Suggested Walking Routes along nearly 45 miles of roadways." - p.26

TR-5.1; TR-5.2				
Increase implementation of transportation demand management (TDM) strategies. Reduce VMT from businesses.	**2019**	**2030**	**2040**	**2045**
Annual existing passenger vehicle miles traveled (VMT)	509,968,096	509,968,096	509,968,096	509,968,096
Percent of household VMT for commuting [1]		28%	28%	28%
Passenger VMT from commuting		142,791,067	142,791,067	142,791,067
Percent reduction in passenger commute VMT from TDM measures [2]		26%	30%	30%
Reduction in passenger commute VMT from TDM measures		37,125,677	42,837,320	42,837,320
Passenger vehicle emissions factor (MTCO2e/mi)		0.0002745	0.0002529	0.0002498
GHG reductions in passenger commute VMT (MTCO2e)		10,191	10,836	10,700
GHG Reductions from TR-5.1; TR-5.2 (MTCO2e)		10,191	10,836	10,700

Source:

[1] https://traveltrends-dev.transportation.org/wp-content/uploads/sites/62/2019/07/B2_CIA_Role-Overall-Travel_web_2.pdf AASHTO Commuting in America 2013

[2] CAPCOA T-5

Note: 78% of residents commute to work by driving alone

VMT Reduction Check

Annual VMT reduction by Measure (Passenger VMT only)

	2030	2040	2045
TR-1.1	7,442,863	13,835,083	22,472,699
TR-3.1; TR-3.2	52,526,714	63,746,012	75,475,278
TR-4.1	199,619	391,254	511,026
TR-5.1; TR-5.2	37,125,677	42,837,320	42,837,320
TR-1.2	27,307,546	26,194,578	25,424,391
Total VMT Reduction from Measures	124,602,419	147,004,247	166,720,713
TOTAL Passenger VMT Forecast	559,587,179	579,143,509	599,858,891
%Reduction in VMT from measures	22%	25%	28%
Total Passenger VMT with Reductions	434,984,761	432,139,262	433,138,177

<-- Ideal range: 20-75%. CAPCOA max reduction for urban areas is 75%. 20% for suburban centers. Milpitas is somewhere in between, leaning toward suburban center.

2015 Passenger VMT	492,014,849
2019 Passenger VMT	509,968,096
2045 Passenger VMT with measures	433,138,177
2045 Passenger VMT without measures	599,858,891
Change from 2015 (w measure	-12%
Change from 2019 (w measure	-15%
Change from 2015 (w/o measu	22%
Change from 2019 (w/o measu	18%
2015 population	87,570
2019 population	90,030
2045 population	107,250
2015 VMT per capita	5,619
2019 VMT per capita	5,664
2045 VMT per capita (w measu	4,039
2045 VMT per capita (w/o mea	5,593
Change from 2015 (w measure	-28%
Change from 2015 (w/o measu	0%
Change from 2019 (w measure	-29%
Change from 2019 (w/o measu	-1%

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach
Electrification and Clean Alternatives	OT-1.1	New and Existing	Off-Road Vehicles and Equipment	Reduce landscaping-related emissions.	962	1,681	1,759	Assumes new lawn and garden equipment are zero-emissions starting in 2028. Assumes 60% and 100% replacement of existing fossil-fuel powered lawn and garden equipment by 2030 and 2040, respectively.
	OT-1.2	New and Existing	Off-Road Vehicles and Equipment	Reduce construction-related emissions.	2,361	3,746	5,176	Assumes 40% of construction equipment are converted to renewable diesel or other zero-carbon alternatives by 2030, 60% by 2040, and 80% by 2045.
				Total	3,324	5,427	6,935	

OT-1.1					
Reduce landscaping-related emissions.	**2019**	**2023**	**2030**	**2040**	**2045**
Zero-emission landscaping equipment starting in 2024					
Lawn and garden emissions (MTCO2e)	1,602	1,624	1,663	1,724	1,781
New land and garden emissions (MTCO2e)		22	61	121	178
GHG reductions from requiring zero-emission equipment in 2024 (MTCO2e)			39	99	156
Replacing old landscaping equipment with zero-emission alternatives					
Existing lawn and garden emissions (MTCO2e)	1,602		1,602	1,602	1,602
Lawn and garden gasoline gallons	182,813	182,813	182,813	182,813	182,813
Lawn and garden diesel gallons	50,319	50,319	50,319	50,319	50,319
Replacement rate for existing equipment			60%	100%	100%
GHG reductions from replacing old equipment (MTCO2e)			961	1,602	1,602
Additional electricity use and emissions					
Gallons of gasoline offset from old equipment			109,688	182,813	182,813
Gallons of diesel offset from old equipment			30,191	50,319	50,319
kBTU of gasoline offset from old equipment (kBTU)			13,710,974	22,851,623	22,851,623
kBTU of diesel offset from old equipment (kBTU)			4,169,392	6,948,986	6,948,986
Assumed average efficiency of gasoline equipment [1]			30%	30%	30%
Assumed average efficiency of diesel equipment [1]			30%	30%	30%
Average efficiency of electric equipment [2]			90%	90%	90%
Electricity needed to offset replaced gasoline equipment (kBTU)			4,570,325	7,617,208	7,617,208
Electricity needed to offset replaced diesel equipment (kBTU)			1,389,797	2,316,329	2,316,329
Total new electricity use (kBTU)			5,960,122	9,933,536	9,933,536
Total new electricity use (MWh)			1,747	2,911	2,911
Electricity emissions factor (MTCO2e/MWh)			0.021606	0.007202	0
Additional GHG emissions from electricity use (MTCO2e)			38	21	-
Summary					
GHG reductions from requiring zero-emission equipment in 2024 (MTCO2e)			39	99	156
GHG reductions from replacing old equipment (MTCO2e)			961	1,602	1,602
Additional GHG emissions from electricity use (MTCO2e)			(38)	(21)	-
GHG Reductions from OT-1.1 (MTCO2e)			962	1,681	1,759

Sources:

[1] average for 4 stroke engine

[2] https://www.energy.gov/sites/prod/files/2014/04/f15/10097517.pdf

OT-1.2				
Reduce construction-related emissions.	**2019**	**2030**	**2040**	**2045**
Renewable diesel or alternative fuels construction equipment				
Construction emissions (MTCO2e)	3,478	5,903	6,244	6,470
Percent conversion to renewable diesel or alternatives		40%	60%	80%
GHG reductions from renewable diesel or alternatives (MTCO2e)		2,361	3,746	5,176
GHG Reductions from OT-1.2 (MTCO2e)		2,361	3,746	5,176

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach	Other Notes
Zero Waste	SW-1.1	New	Solid Waste	Eliminate the disposal of organic solid waste in landfills.	9,385	17,010	21,055	Quantified at the Strategy level, assuming a current diversion rate of 60% and targeting a 90% diversion rate by 2045. Current diversion rate in Milpitas is unknown; CalRecycle reports an 83% disposal rate and the City estimates a <40% diversion rate. Used Elk Grove Waste Reduction Measure (RC-1) as an example.	
	SW-1.2			Increase recycling and the diversion of other inorganic solid waste.					
	SW-1.3			Reduce the generation of waste from residents and businesses.					
	SW-1.4			Reduce the generation of construction and demolition waste.					
	SW-1.5			Facilitate repair and reuse of consumer products.					
Landfill Emissions	SW-2.1	New	Solid Waste	Dispose waste at innovative facilities.	NA	NA	NA	Not quantifiable.	
	SW-2.2	New	Solid Waste	Support waste-to-energy facilities.	NA	NA	NA	Not quantifiable.	
Waste Policy	SW-3.1	New	Solid Waste	Engage with waste-related policymaking.	NA	NA	NA	Not quantifiable.	
				Total	9,385	17,010	21,055		

SW-1				
Zero Waste	**2019**	**2030**	**2040**	**2045**
Achieve a zero waste diversion rate of 90% by 2045				
Legislative-adjusted forecasted emissions				
Emissions from landfilled solid waste	22,040	23,405	25,452	26,255
Emissions from alternative daily cover	973	1,033	1,124	1,159
Emissions from composted yard trimmings	553	588	639	659
Total forecasted emissions from solid waste	23,566	25,026	27,215	28,074
Measure reduction				
Estimated diversion rate* [1]	60%			
Targeted diversion rate		75%	85%	90%
Adjusted Forecasted Emissions from Solid Waste (MTCO2e)		15,641	10,206	7,018
GHG Reductions from SW-1 (MTCO2e)		9,385	17,010	21,055

Source:

[1] https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion

* The diversion rate for the City is unclear; the disposal rate provided by CalRecycle is 83%, while the diversion rate estimated by the City is ~40%. The disposal rate for nearby-city Fremont is 56%, and the average estimated statewide diversion rate between 2010 and 2017 is approximately 64% [1]. Based on this data, assuming a conservative diversion rate of 60%.

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach
Water Conservation	WA-1.1	New and Existing	Residential and Nonresidential	Reduce indoor water consumption in buildings.	85	39	0	Assumes a 25% reduction in water usage in new development by 2030, 30% by 2040, and 35% by 2045. Assumes a 20% reduction in water usage in existing development by 2030, 25% by 2040, and 30% by 2045.
	WA-1.2	New and Existing	Residential and Nonresidential	Reduce water consumption for irrigation and landscaping.	59	28	0	Assumes a 25% reduction in outdoor water consumption in existing development by 2030, 30% by 2040, and 35% by 2045. Assumes a 60% reduction in new development by 2030, 70% by 2040, and 75% by 2045.
Recycled Water	WA-2.1	New and Existing	Residential	Increase the use of recycled water.	NA	NA	NA	Not quantifiable.
Wastewater Treatment	WA-3.1	New and Existing	Residential and Nonresidential	Generate biogas at wastewater treatment plants.	NA	NA	NA	Not quantifiable.
				Total	144	67	-	

WA-1.1				
Reduce indoor water consumption in buildings.	**2019**	**2030**	**2040**	**2045**
Water reductions from ultra-low-flow appliances required in all new development				
Electricity use for water supply in all development				
SFPUC electricity usage (MWh)	9,663	10,261	11,159	11,511
SCVWD electricity usage (MWh)	6,607	7,016	7,630	7,870
SBWR electricity usage (MWh)	1,053	1,118	1,216	1,254
Electricity use for water supply in new development				
SFPUC electricity usage in new development (MWh)		598	1,496	1,848
SCVWD electricity usage in new development (MWh)		409	1,023	1,264
SBWR electricity usage in new development (MWh)		65	163	201
Target percent reduction in water usage in new development under measure		25%	30%	35%
Electricity reductions from reduced water use				
SFPUC reduced electricity usage (MWh)		150	449	647
SCVWD reduced electricity usage (MWh)		102	307	442
SBWR reduced electricity usage (MWh)		16	49	70
SFPUC emissions factor (MTCO2e/MWh)		-	-	-
SCVWD emissions factor (MTCO2e/MWh)		0.05178	0.01726	-
SBWR emissions factor (MTCO2e/MWh)		0.05178	0.01726	-
GHG reductions in new development (MTCO2e)		6	6	0
Water reductions from ultra-low-flow appliances in existing development				
Electricity use for water supply in existing development				
SFPUC electricity usage (MWh)		9,663	9,663	9,663
SCVWD electricity usage (MWh)		6,607	6,607	6,607
SBWR electricity usage (MWh)		1,053	1,053	1,053
Target percent reduction in water usage in existing development under measure		25%	30%	35%
SFPUC reduced electricity usage (MWh)		1,933	2,416	2,899
SCVWD reduced electricity usage (MWh)		1,321	1,652	1,982
SBWR reduced electricity usage (MWh)		211	263	316
SFPUC emissions factor (MTCO2e/MWh)		-	-	-
SCVWD emissions factor (MTCO2e/MWh)		0.05178	0.01726	-
SBWR emissions factor (MTCO2e/MWh)		0.05178	0.01726	-
GHG reductions in existing development (MTCO2e)		79	33	0
GHG Reductions from WA-1.1 (MTCO2e)		85	39	-

WA-1.2					
Reduce water consumption for irrigation and landscaping.	**2019**	**2030**	**2040**	**2045**	
Landscaping irrigation water use per capita per day (gallons) [1]	54				
Annual landscaping irrigation water use per capita per year (gallons)	19,601				
Milpitas population	90,030	95,605	103,970	107,250	
Estimated annual water demand for landscaping (MG)	1,765	1,874	2,038	2,102	
In existing development		1,765	1,765	1,765	
In new development		109	273	338	
Percent reduction in outdoor landscaping water from Water Efficient Landscape and Water Conservation Ordinances, drought-tolerant and water-conserving native landscaping, and water-efficient irrigation equipment programs					
In existing development		25%	30%	35%	
In new development		60%	70%	75%	
Annual water reduction (MG)					
In existing development		441	529	618	
In new development		66	191	253	
Total annual water reduction (MG)		507	721	871	
Emissions factor for water supply (MTCO2e/MG)		0.11569	0.03856	-	
GHG reductions (MTCO2e)		59	28	-	

Source:
[1] https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/California-Water-Plan/Docs/Update2018/Final/SupportingDocs/Water-Portfolios-and-Balances.pdf

California Water Use (2011-2015) (millions of acre feet)					
Water Year	2011	2012	2013	2014	2015
Residential Exterior	2.3	2.4	2.5	2.4	1.9
Populations (from the Department of Finance)	37,561,624	37,924,661	38,269,864	38,556,731	38,870,150

Strategy	Measure Number	New/Existing	Sector	Measure	2030	2040	2045	Quantification approach
Urban Forestry and Open Space	MI-1.1		Miscellaneous	Protect native trees and vegetation and enhance carbon sequestration.	2,632	6,601	8,586	iTree Canopy
Urban Heat Island Reduction	MI-2.1		Miscellaneous	Reduce the urban heat island effect to conserve energy.	NA	NA	NA	
Green Infrastructure	MI-3.1		Miscellaneous	Increase the use of green infrastructure.	NA	NA	NA	
Green Business and Jobs	MI-4.1		Miscellaneous	Incentivize and promote green business practices.	NA	NA	NA	
	MI-4.2		Miscellaneous	Support green jobs in the city.	NA	NA	NA	
Carbon Sequestration and Embodied Emissions	MI-5.1		Miscellaneous	Increase soil carbon content.	NA	NA	NA	
	MI-5.2		Miscellaneous	Use low-carbon and carbon sequestering construction materials in new development.	NA	NA	NA	
				Total	2,632	6,601	8,586	

MI-1.1				
Protect native trees and vegetation and enhance carbon sequestration.	**2019**	**2030**	**2040**	**2045**
Existing Conditions [1]				
Current Tree Carbon Storage (MTCO2e)	133,365			
Current Tree Carbon Sequestration (MTCO2e/year)	5,307			
Tree coverage (square miles)	1.8			
Carbon sequestration per area (MTCO2e/square mile/year)	2900.0			
Percent tree coverage (Existing [1] and targets)	13%	20%	30%	35%
Percent increase from 2019		50%	124%	162%
New Tree coverage (square miles) [1]		0.9	2.3	3.0
Additional Sequestration from expanded trees (MTCO2e/year)		2,632	6,601	8,586
GHG Reductions from MI-1.1 (MTCO2e)		2,632	6,601	8,586

[1] Estimated in iTree Canopy based on a sample of 500 points.
https://canopy.itreetools.org/

<--City of Toronto committed to 30%-40% urban forestry cover, up from 25% (http://wx.toronto.ca/inter/it/newsrel.nsf/7017df2f20edbe2885256619004e428e/c3c788e736e7f0d0852584fe00734171?OpenDocument)

Assumptions and Conversion Factors

Milpitas Greenhouse Gas Inventory and Forecasts

Category	Value	Notes	Source
Conversion Factors			
g/MT	1000000		
g/lb	453.592		
g/kg	1000		
lb/MT	2204.622622		
kg/MT	1000		
MT/ton	0.907185		
g/ton	907185		
lb/kg	2.20462		
kWh/MWh	1000		
MWh/GWh	1000		
gal/cubic foot	7.480519481		
gal/Liter	0.264172052		
Liter/gallon	3.785411784		
gallon/acrefoot	325,851.43		
days/year	365		
million gal/acre-feet	0.325851432		
MMBTU/gallon (diesel)	0.1374		
MMBTU/scf (natural gas)	0.001037		
therms/scf	0.01037		
kBTU/gal (gasoline)	125		
kBTU/gal (diesel)	138.1		
kBTU/kWh	3.41		

GWP		
Source (Select)	*IPCC Fifth Assessment Report (Avg)*	<--drop down selection
CO2	1	
CH4	28	
N2O	265	

Source	CO2 GWP	CH4 GWP	N2O GWP
IPCC Fourth Assessment Report (w/o climate carbon feedback)	1	25	265
IPCC Fourth Assessment Report (with climate carbon feedback)	1	34	298
IPCC Fourth Assessment Report (Avg)	1	25	298
IPCC Fifth Assessment Report (Avg)	1	28	265
IPCC Third Assessment Report	1	23	296
IPCC Second Assessment Report	1	21	310

Electricity Emission Factors	**2005**	**2015**	**2018**	**2019**	**2020**	**2030**	**2040**	**2045**	**Source**
PG&E EF (lb CO2/MWh)	489	404.51	206.29	197.8123	189.3347	113.0356	37.6785	0	https://www.theclimateregistry.org/our-members/cris-public-reports/
CAMX EF (lb CH4/MWh)	0.03024	0.033	0.034	0.0327	0.0315	0.0189	0.0063	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
CAMX EF (lb N2O/MWh)	0.00808	0.004	0.004	0.00385	0.0037	0.0022	0.0007	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
CAMX EF (lb CO2/MWh)	724.12	527.9	496.50	478.1111	459.7222	275.8333	91.9444	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
RPS Requirements									
PG&E									
Percent Renewable			27%	30%	33%	60%	87%	100%	
Increase in Renewables (from 2018)				3%	6%	33%	60%		
SVCE EF (lb CO2/MWh)				2.34	2.2397	1.3371	0.4457	0.0000	SVCE Inventory
MTCO2e/MWh						0.021606	0.007202	0.0000	

*2005 PG&E emissions factor provided by previous 2005 inventory and confirmed here: https://www.ca-ilg.org/sites/main/files/file-attachments/ghg_emission_factor_guidance.pdf

*2015 data is proxy data from 2016

Fuel Emission Factors			
Fuel	Emission Factor	Unit	Source
Diesel (backup generators)	10.21	kg CO2/gal	Climate Registry 2020 Default Emission Factors
	0.9	g CH4/MMBTU	
	0.4	g N2O/MMBTU	
Natural Gas (backup generators)	0.05444	kg CO2/scf	
	0.9	g CH4/MMBTU	
	0.9	g N2O/MMBTU	

22.5091702	lb CO2/gal				
0.000272586	lb CH4/gal	22.5489072	lb CO2e/gal	0.0102280123	MTCO2e/gal
0.000121149	lb N2O/gal				
11.57372351	lb CO2/therm				
0.000198416	lb CH4/therm	11.63185946	lb CO2e/therm	0.005276123	MTCO2e/therm
0.000198416	lb N2O/therm				

Natural Gas (lb/therm)

CO_2	CH_4	N_2O	MTCO2e/therm
11.7	0.000226742	0.000005	0.005310456

EMFAC2021 Emission Factors - Passenger	
Year	Emission Factor (MTCO2e/mile)
2019	
2030	0.000274487
2040	0.000252949
2045	0.000249778

EMFAC Emission Factors - Commercial	
Year	Emission Factor (MTCO2e/mile)
2019	
2030	0.001122798
2040	0.000870220
2045	0.000812973

Measure Number	Measure Title	2030	2040	2045
	Buildings and Public Lighting			
ME-1.1	Reduce lighting-related energy consumption.	2	1	-
ME-1.2	Increase energy efficiency.	0	0	-
ME-1.3	Implement conservation best practices to reduce energy use.	NA	NA	NA
ME-2.1	Transition municipal buildings and facilities to be all-electric.	351	707	878
ME-3.1	Continue to use SVCE-supplied 100% carbon-free electricity.	NA	NA	NA
ME-3.2	Transition to 100% clean energy for municipal operations.	NA	NA	NA
	Employee Commute			
MEC-1.1	Reduce employee commute VMT and support low-carbon alternatives.	406	576	769
	Vehicle Fleet			
MVF-1.1	Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	924	840	830
	Solid Waste			
MSW-1.1	Increase waste diversion and achieve zero waste by 2030.	20	35	43
MSW-2.1	Implement an environmentally preferable purchasing policy.	NA	NA	NA
	Water			
MWA-1.1	Reduce municipal water consumption.	1	0	0

Total Reductions from Measures	1,703	2,158	2,520
Reduction Needed for Target	841	2,090	2,759
Gap Needed to Achieve Target*	(862)	(68)	239

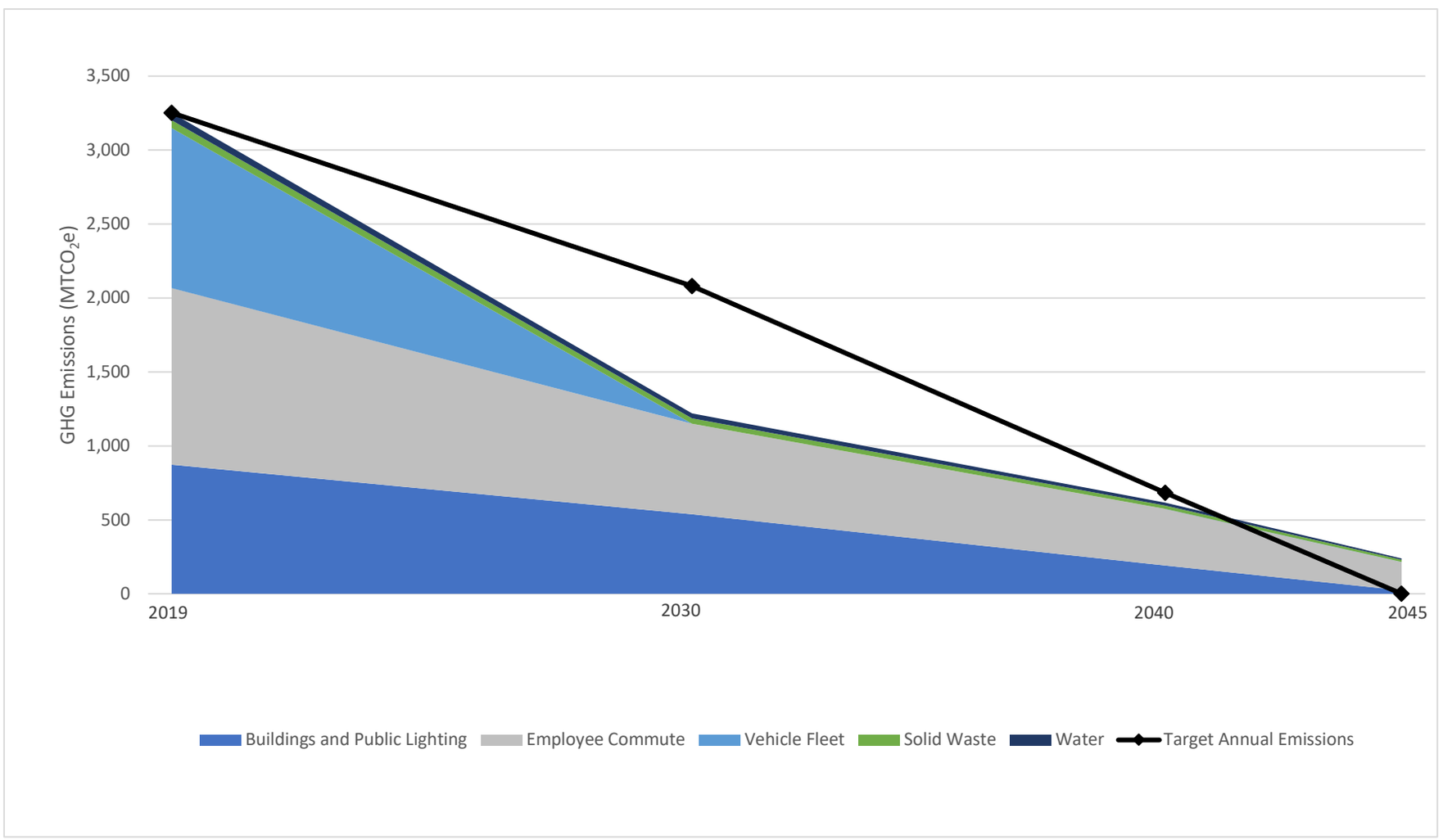
**negative numbers mean target has been achieved; positive values means there is a gap*

Legislative-Adjusted BAU Emissions	2,923	2,773	2,759
Legislative-Adjusted BAU Emissions - Reductions from Measures	1,219	615	239
Total Target Emissions	2,081	683	-

Reduction Targets

	2019	**2030**	**2040**	**2045**
Emissions	3,252	2,923	2,773	2,759
Target %	-	36%	79%	100%
Target	-	2,081	683	0
Reduction	-	841	2,090	2,759

Emissions with Measures Applied	**2019**	**2030**	**2040**	**2045**
Buildings and Public Lighting	873	538	190	23
Employee Commute	1,195	611	385	192
Vehicle Fleet	1,081	1	0	0
Solid Waste	53	36	22	15
Water	50	33	17	9
Total	3,252	1,219	615	239
Target Annual Emissions	3,252	2,081	683	-
Axis	-	-	-	-



Measure Number	Measure Title	2030	2040	2045
ME-1.1	Reduce lighting-related energy consumption.	2	1	-
ME-1.2	Increase energy efficiency.	0	0	-
ME-1.3	Implement conservation best practices to reduce energy use.	NA	NA	NA
ME-2.1	Transition municipal buildings and facilities to be all-electric.	351	707	878
ME-3.1	Continue to use SVCE-supplied 100% carbon-free electricity.	NA	NA	NA
ME-3.2	Transition to 100% clean energy for municipal operations.	NA	NA	NA
MEC-1.1	Reduce employee commute VMT and support low-carbon alternatives.	406	576	769
MVF-1.1	Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	924	840	830
MSW-1.1	Increase waste diversion and achieve zero waste by 2030.	20	35	43
MSW-2.1	Implement an environmentally preferable purchasing policy.	NA	NA	NA
MWA-1.1	Reduce municipal water consumption.	1	0	-
	Total Reductions from Measures	1,703	2,158	2,520
	Reduction Needed for Target	841	2,090	2,759
	Gap Needed to Achieve Target*	(862)	(68)	239

**negative numbers mean target has been achieved; positive values means there is a gap*

Reduction Targets

	2019	2030	2040	2045
Emissions	3,252	2,923	2,773	2,759
Target %		36%	79%	100%
Target		2,081	683	-
Reduction		841	2,090	2,759

Sector	Strategy	Measure Number	New/Existing	Measure	2030	2040	2045	Quantification approach	Actions	Other Notes
Buildings and Public Lighting	Energy Efficiency and Conservation	ME-1.1		Reduce lighting-related energy consumption.	2	1	-	ENGIE/ESCO data provided by City.		
Buildings and Public Lighting		ME-1.2		Increase energy efficiency.	0	0	-	ENGIE/ESCO data provided by City.		
Buildings and Public Lighting		ME-1.3		Implement conservation best practices to reduce energy use.	NA	NA	NA	Not quantifiable.		
Buildings and Public Lighting	Electrification	ME-2.1		Transition municipal buildings and facilities to be all-electric.	351	707	878	All-electric new development starting in 2030, and all-electric existing buildings by 2045.		
Buildings and Public Lighting	Clean Energy	ME-3.1		Continue to use SVCE-supplied 100% carbon-free electricity.	NA	NA	NA	City currently using SVCE-supplied 100% carbon free energy.		
Buildings and Public Lighting		ME-3.2		Transition to 100% clean energy for municipal operations.	NA	NA	NA	Included in ME-2.1 and MVF-1.1.		
Employee Commute	Sustainable Employee Commutes	MEC-1.1		Reduce employee commute VMT and support low-carbon alternatives.	406	576	769	Assumes reductions in fossil-fuel powered employee commutes from EVs/altnerative fuels, active transportation, transit, and telecommuting/flexible schedules of 40%, 60%, and 80% in 2030, 2040, and 2045, respectively .		
Vehicle Fleet	Low- and Zero-Emission Fleet Vehicles and Equipment	MVF-1.1		Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	924	840	830	Inventory assumed all gasoline usage was on-road vehicles and all diesel usage was off-road vehicles and equipment. Quantification assumes all gasoline is converted to EV by 2030.		
Solid Waste	Zero Waste	MSW-1.1		Increase waste diversion and achieve zero waste by 2030.	20	35	43	Assumed 60% diversion rate currently, targetting 90% by 2030.		
	Responsible Consumption	MSW-2.1		Implement an environmentally preferable purchasing policy.	NA	NA	NA	Not quantifiable.		
Water	Water Efficiency and Conservation	MWA-1.1		Reduce municipal water consumption.	1	0	-	ENGIE/ESCO data provided by City.		
				Total	1,703	2,158	2,520			

ME-1.1				
Reduce lighting-related energy consumption.	**2019**	**2030**	**2040**	**2045**
Lighting upgrade annual electricity savings (kWh) [1]				
Interior and exterior lighting at facilities		1,137,349	1,137,349	1,137,349
Streetlights		1,771,359	1,771,359	1,771,359
Sports lighting		49,571	49,571	49,571
Park lighting		151,312	151,312	151,312
Total (kWh)		3,109,591	3,109,591	3,109,591
Total (MWh)		3,110	3,110	3,110
Total (MWh) scaled with municipal growth forecast		3,110	3,368	3,410
SVCE electricity emissions factor (g CO2e/MWh)		607	202	-
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
GHG reductions from lighting upgrades (MTCO2e)		2	1	-
GHG Reductions from ME-1.1 (MTCO2e)		2	1	-

Source:

[1] ESCO Explainer for CAP Measures.docx (document provided by the City)

ME-1.2				
Increase energy efficiency.	**2019**	**2030**	**2040**	**2045**
HVAC upgrades electricity savings (kWh) [1]		21,982	23,809	26,111
High-Efficiency Transformers (kWh) [1]		112,956	112,956	112,956
Total upgrades electricity savings (MWh)		135	137	139
SVCE electricity emissions factor (g CO2e/MWh)		607	202	-
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
GHG reductions from energy efficiency upgrades (MTCO2e)		0	0	-
GHG Reductions from ME-1.2 (MTCO2e)		0	0	-

Source:

[1] ESCO Explainer for CAP Measures.docx (document provided by the City)

ME-2.1				
Transition municipal buildings and facilities to be all-electric.	**2019**	**2030**	**2040**	**2045**
All-electric new development by 2030				
Natural gas usage (therms)	155,596	159,681	161,615	162,601
New natural gas usage (therms)		4,085	6,019	7,005
Natural gas savings from all-electric new development in 2030 (therms)			1,935	2,920
Natural gas emissions factor (MTCO2e/therm)			0.0053105	0.0053105
GHG reductions from natural gas savings in new development (MTCO2e)			10	16
Diesel backup generator usage (gallons)	3,456	3,547	3,590	3,612
New diesel backup generator usage (gallons)		91	134	156
Diesel savings from all-electric new development in 2030 (gallons)			43	65
Diesel backup generator emissions factor (MTCO2e/gallon)			0.0102280	0.0102280
GHG reductions from diesel savings in new development (MTCO2e)			0.4	0.7
GHG reductions from all-electric new development in 2030 (MTCO2e)			11	16
All-electric retrofits for existing buildings by 2045				
Existing natural gas usage (therms)		155,596	155,596	155,596
Percent of buildings retrofitted from natural gas		40%	80%	100%
Existing diesel backup generator usage (gallons)		3,456	3,456	3,456
Percent of buildings retrofitted from diesel backup generators		60%	100%	100%
Reduced natural gas (therms)		62,238	124,477	155,596
Reduced diesel backup generator usage (gallons)		2,074	3,456	3,456
Natural gas emissions factor (MTCO2e/therm)		0.0053105	0.0053105	0.0053105
Diesel backup generator emissions factor (MTCO2e/gallon)		0.0102280	0.0102280	0.0102280
GHG reductions from all-electric retrofits by 2045 (MTCO2e)		352	696	862
Additional electricity use and emissions				
Assumed average efficiency of natural gas heating (conservative) [1]	78%			
Assumed average efficiency of electric heating [2]	100%			
kWh per therm conversion	29.3001			
Total therms offset from natural gas heating use (therms)		62,238	126,411	158,516
Total electricity needed to offset natural gas heating (MWh)		1,422	2,889	3,623
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
Additional GHG emissions from electricity use (MTCO2e)		1	1	-
GHG Reductions from ME-2.1 (MTCO2e)		351	707	878

Sources:

[1] Energy Solutions Center. 2021. Natural Gas Furnaces. Available: https://naturalgasefficiency.org/for-residential-customers/heat-gas_furnace/#:~:text=All%20furnaces%20built%20and%20sold,furnace%20with%20standing%20pilot%20%E2%80%93%2050%25

[2] U.S. DOE. 2021. Electric Resistance Heating. Available: https://www.energy.gov/energysaver/home-heating-systems/electric-resistance-heating#:~:text=Electric%20resistance%20heating%20is%20100,the%20fuel's%20energy%20into%20electricity.

MEC-1.1				
Reduce employee commute VMT and support low-carbon alternatives.	**2019**	**2030**	**2040**	**2045**
Annual employee commute VMT	3,508,561	3,706,429	3,800,139	3,847,879
Annual GHG emissions from employee commutes (MTCO2e)	1195	1017	961	961
Percent reduction in employee commute emissions		40%	60%	80%
GHG reductions from employee commutes (MTCO2e)		407	577	769
Additional GHG emissions from EVs				
Annual employee commute VMT	3,508,561	3,706,429	3,800,139	3,847,879
Percent of reduction in employee commute VMT that comes from employee vehicle conversions to EVs		30%	50%	70%
Converted EV VMT for employee commutes		444,771	1,140,042	2,154,812
Average Efficiency of EV LDV (kWh/100-mi) [2]		34	34	34
Charged amount (MWh)		1,246	1,278	1,294
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
Additional GHG emissions from EV on-road fleet (MTCO2e)		1	0	-
GHG Reductions from MEC-1.1 (MTCO2e)		406	576	769

< Includes reductions from EV/alternative fuels commutes, active transportation, transit, and telecommuting/flexible schedules

Source:

[1] http://www.fueleconomy.gov/feg/download.shtml (Without EV efficiency forecasts, EV efficiency assumed to be the same for all future years)

MVF-1.1 Convert the City's fleet vehicles and equipment to all-electric or alternative fuels, such as renewable diesel.	2019	2030	2040	2045
Gasoline on-road vehicles				
Annual GHG emissions from on-road vehicle fleet (MTCO2e)	823	700	662	662
Additional GHG emissions from EVs				
Annual gasoline usage in on-road vehicles (gallons)	92,606	97,829	100,302	101,562
Average gasoline fleet vehicle fuel economy (miles/gallon)	25	25	25	25
Annual VMT from gasoline fleet vehicles	2,315,150	2,445,715	2,507,550	2,539,052
Average Efficiency of EV LDV (kWh/100-mi) [2]		34	34	34
Charged amount (MWh)		822	843	854
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
Additional GHG emissions from EV on-road fleet (MTCO2e)		0	0	-
Diesel off-road vehicles and equipment				
Annual GHG emissions from off-road vehicles and equipment (MTCO2e)	258	224	178	169
Additional electricity use and emissions				
Gallons of diesel from converting off-road vehicles and equipment		26,383	27,051	27,390
Zero-emission alternatives replacement rate		70%	85%	100%
Gallons of diesel offset from converting off-road vehicles and equipment		18,468	22,993	27,390
kBTU of diesel offset from old equipment (kBTU)		2,550,492	3,175,328	3,782,610
Assumed average efficiency of diesel equipment [2]		30%	30%	30%
Average efficiency of electric equipment [3]		90%	90%	90%
Electricity needed to offset replaced diesel equipment (kBTU)		850,164	1,058,443	1,260,870
Total new electricity use (MWh)		249	310	370
SVCE electricity emissions factor (MTCO2e/MWh)		0.00061	0.000202	0
Additional GHG emissions from electricity use (MTCO2e)		0	0	-
GHG Reductions from MVF-1.1 (MTCO2e)		924	840	830

Sources:

[1] http://www.fueleconomy.gov/feg/download.shtml (Without EV efficiency forecasts, EV efficiency assumed to be the same for all future years)
[2] average for 4 stroke engine
[3] https://www.energy.gov/sites/prod/files/2014/04/f15/10097517.pdf

MSW-1.1				
Increase waste diversion and achieve zero waste by 2030.	**2019**	**2030**	**2040**	**2045**
Achieve a zero waste diversion rate of 90% by 2030				
Landfilled solid waste (tons)	157	166	170	172
Emissions from landfilled solid waste	53	56	57	58
Estimated diversion rate*	60%			
Targeted diversion rate		75%	85%	90%
GHG reductions from zero waste (MTCO2e)		20	35	43
GHG Reductions from MSW-1.1 (MTCO2e)		20	35	43

*Assumed estimated diversion rate for municipal operations in 2019.

MWA-1.1					
Reduce municipal water consumption.		**2019**	**2030**	**2040**	**2045**
Total water usage (MG)		155			
Total water cost ($)	$	1,044,941			
Cost per million gallons ($/MG)	$	6,751			
ESCO anticipated cost savings from retrofit upgrades ($) [1]	$	30,532			
Estimated water savings (MG)			5	5	5
Water emissions factor (MTCO2e/MG)			0.15116	0.050386	0
GHG reductions from water retrofit upgrades (MTCO2e)			1	0	-
GHG Reductions from MWA-1.1 (MTCO2e)			1	0	-

Source:

[1] ESCO Explainer for CAP Measures.docx (document provided by the City)

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gallon/acrefoot	325,851.43		
days/year	365		
million gal/acre-feet	0.325851432		
MMBTU/gallon (diesel)	0.1374		
MMBTU/scf (natural gas)	0.001037		
therms/scf	0.01037		
kBTU/gal (gasoline)	125		
kBTU/gal (diesel)	138.1		
kBTU/kWh	3.41		

GWP		
Source (Select)	*IPCC Fifth Assessment Report (Avg)*	<--drop down selection
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CH4	28	
N2O	265	

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Electricity Emission Factors	**2005**	**2015**	**2018**	**2019**	**2020**	**2030**	**2040**	**2045**	**Source**
PG&E EF (lb CO2/MWh)	489	404.51	206.29	197.8123	189.3347	113.0356	37.6785	0	https://www.theclimateregistry.org/our-members/cris-public-reports/
CAMX EF (lb CH4/MWh)	0.03024	0.033	0.034	0.0327	0.0315	0.0189	0.0063	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
CAMX EF (lb N2O/MWh)	0.00808	0.004	0.004	0.00385	0.0037	0.0022	0.0007	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
CAMX EF (lb CO2/MWh)	724.12	527.9	496.50	478.1111	459.7222	275.8333	91.9444	0	eGRID (https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid)
RPS Requirements									
PG&E									
Percent Renewable			27%	30%	33%	60%	87%	100%	
Increase in Renewables (from 2018)				3%	6%	33%	60%		
SVCE EF (lb CO2/MWh)				2.34	2.2397	1.3371	0.4457	0.0000	SVCE Inventory
MTCO2e/MWh						0.021606	0.007202	0.0000	

*2005 PG&E emissions factor provided by previous 2005 inventory and confirmed here: https://www.ca-ilg.org/sites/main/files/file-attachments/ghg_emission_factor_guidance.pdf

*2015 data is proxy data from 2016

Fuel Emission Factors								
Fuel	Emission Factor	Unit	Source					
Diesel (backup generators)	10.21	kg CO2/gal	Climate Registry 2020 Default Emission Factors	22.5091702	lb CO2/gal	22.5489072	lb CO2e/gal	0.0102280123	MTCO2e/gal
	0.9	g CH4/MMBTU		0.000272586	lb CH4/gal				
	0.4	g N2O/MMBTU		0.000121149	lb N2O/gal				
Natural Gas (backup generators)	0.05444	kg CO2/scf		11.57372351	lb CO2/therm				
	0.9	g CH4/MMBTU		0.000198416	lb CH4/therm	11.63185946	lb CO2e/therm	0.005276123	MTCO2e/therm
	0.9	g N2O/MMBTU		0.000198416	lb N2O/therm				

Natural Gas (lb/therm)

CO_2	CH_4	N_2O	MTCO2e/therm
11.7	0.000226742	0.000005	0.005310456

EMFAC2021 Emission Factors - Passenger	
Year	Emission Factor (MTCO2e/mile)
2019	
2030	0.000274487
2040	0.000252949
2045	0.000249778

EMFAC Emission Factors - Commercial	
Year	Emission Factor (MTCO2e/mile)
2019	
2030	0.001122798
2040	0.000870220
2045	0.000812973

MEASURE NUMBER	MEASURE	Action Number	ACTION	PRIORITIZATION SCORE	GHG Emissions Reduction Potential	City Cost Effectiveness	Residential and Business Cost Effectiveness	Technological/ Implementation Feasibility	Current Policies or Ordinances	Jurisdictional Control	Implementation Timeframe	COBENEFITS: Benefits to Renters	Equity	Air Pollution Prevention	Health and Well-Being	Reliability	Resilience	Job Development	Resource Preservation
BUILDING ENERGY																			
STRATEGY 1. SHIFT TO CLEAN AND RELIABLE ENERGY																			
BE-1.1	Achieve 100 percent carbon-free electricity by 2030 in all existing and new development.	BE-1.1.1	Require new development to install on-site renewable energy and storage systems capable of meeting anticipated building energy consumption, or participate in a group-buy solar and storage program, or opt-in to SVCE.	22	8		2	2	2	1	2	0	0	1	1	1	1	1	0
		BE-1.1.2	Review zoning regulations for opportunities to simplify and encourage renewable energy systems.	20	8	0		2	2	1	2	0	2	0	0	1	1	1	0
		BE-1.1.3	Conduct outreach to residents and business owners to increase awareness of SVCE's carbon-free electricity supply.	18	8	0		2	2	1	2	1	2	0	0	0	0	0	0
		BE-1.1.5	Require new nonresidential development that cannot meet electricity demand through onsite renewable energy generation and storage to purchase 100% carbon-free electricity from SVCE. Work with SVCE to provide a cost-effective direct access program.	18	8		2	2	0	1	2	0	0	1	0	0	1	1	0
		BE-1.1.4	Require all newly built parking structures to have solar generation capabilities.	17	6		2	2	0	1	2	0	0	1	0	1	1	1	0
		BE-1.1.5	Collaborate with the Milpitas Chamber of Commerce and other partners to identify regional programs that could provide necessary financial arrangements to facilitate the use of PPAs for residential and nonresidential buildings.	16	8		2	0	2	1	1	0	2	0	0	0	0	0	0
		BE-1.1.6	Require the installation of solar heaters for all new swimming pools.	15	8		0	0	0	1	2	0	0	1	0	1	1	1	0
		BE-1.1.7	Work with utility partners (e.g., PG&E, SVCE, state regulators) to improve electric grid reliability.	15	4		2	0	0	0	2	0	2	1	1	1	1	1	0
BE-1.2	Facilitate innovative approaches to energy generation, distribution, and storage (e.g., microgrids).	BE-1.2.1	Consider opportunities for alternative energy generation, energy recapture (in-conduit hydro, co-generation), and distributed energy storage systems.	13	4	2		2	2	0	2	0	0	0	0	1	0	0	0
		BE-1.2.2	Collaborate with SVCE to encourage local schools and hospitals to develop microgrids, separate from utility-scale storage systems.	12	4	2		2	0	0	2	0	0	0	0	1	1	0	0
BE-1.3	Strengthen community awareness of energy efficiency, energy conservation, electrification, and clean energy.	BE-1.3.1	Work with regional partner agencies and utilities, such as BAAQMD, PG&E, and SVCE, to promote State rebates and other incentives and funding opportunities for renewable energy.	18	8		2	2	2	0	2	0	2	0	0	0	0	0	0
		BE-1.3.2	Develop and implement a comprehensive energy efficiency, energy conservation, electrification, and clean energy outreach and education campaign to support emissions reductions from building energy use.	18	6	0		2	2	1	2	1	2	0	1	0	0	1	0
STRATEGY 2. MAXIMIZE BUILDING DECARBONIZATION AND EFFICIENCY																			
BE-2.1	Adopt updated "reach" building codes with each building and energy code cycle to accelerate all-electric new development.	BE-2.1.1	Adopt an updated reach code for the 2022 code cycle that prohibits the installation of natural gas infrastructure in new development.	20	6	0		2	2	1	2	1	2	1	1	0	1	1	0
		BE-2.1.2	Adopt a ban on the installation of fossil fuel-powered backup energy sources in new development by 2030.	18	4	0		2	2	1	2	1	2	1	1	0	1	1	0
		BE-2.1.3	Partner with BayREN, SVCE, PG&E, other cities, and the private sector to develop effective strategies to facilitate electrification implementation.	13	4	2		2	0	0	2	1	2	0	0	0	0	0	0
		BE-2.1.4	Increase awareness and create incentives for developers to build all-electric buildings, such as reduced permit and/or impact fees.	10	4	0	2	2	0	1	1	0	0	0	0	0	0	0	0
BE-2.2	Facilitate all-electric development projects for industrial buildings.	BE-2.2.1	Build market demand for all-electric industrial buildings.	7	4	0	2	0	0	0	0	0	0	0	0	0	0	1	0
BE-2.3	Expand the City's Green Building Program.	BE-2.3.1	Develop additional incentives, above and beyond expedited building permit processing, for projects that incorporate sustainable design approaches and/or elements that exceed local, regional, and State requirements.	18	8		2	0	2	1	1	0	2	0	0	0	1	0	1
BE-2.4	Retrofit existing residential and nonresidential buildings and municipal facilities to improve energy efficiency and facilitate fuel switching.	BE-2.4.1	Develop a comprehensive energy retrofit program to transition existing residential buildings to all-electric by 2045. Begin program providing education and incentives then transition to point-of-sale and replace retrofit requirements.	23	8	0	2	2	2	1	1	1	2	1	1	0	1	1	0
		BE-2.4.2	Connect building owners to funding resources and financing options, such as Energy Upgrade California, for energy efficiency retrofits and improvement projects.	18	8		2	2	2	0	2	0	2	0	0	0	0	0	0
		BE-2.4.3	Develop a comprehensive energy retrofit program to transition existing nonresidential buildings to all-electric, aiming for a 60% conversion rate by 2045. Begin program providing incentives then transition to point-of-sale and replace retrofit requirements.	14	6	0	0	0	0	1	1	0	2	1	1	0	1	1	0
		BE-2.4.4	Eliminate the provision of fossil fuel-powered backup generator permits for existing nonresidential development by 2030.	11	6	0	0	2	0	1	0	0	0	1	1	0	0	0	0
BE-2.5	Facilitate energy audits for existing buildings to identify energy efficiency retrofit and electrification opportunities.	BE-2.5.1	Work with PG&E, SVCE, and other agencies to provide free energy audits of existing residential and nonresidential buildings.	17	4	0	2	2	2	1	2	1	2	0	0	0	0	1	0
		BE-2.5.2	Encourage ongoing energy benchmarking in existing nonresidential buildings, consistent with regulatory benchmarking programs and existing green building standards to help close the energy efficiency information gap.	13	4	2		2	2	0	2	0	0	0	0	0	0	1	0
BE-2.6	Reduce plug loads in existing buildings.	BE-2.6.1	Use partnerships to promote appliance upgrades to energy-efficient technologies and products through campaigns targeted at residents and local businesses, ENERGY STAR® appliance change-out programs, and incentives (e.g., give-a-ways, federal/state/utility rebates, etc.).	15	4		2	2	2	0	2	1	2	0	0	0	0	0	0
		BE-2.6.2	Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, within existing buildings.	15	4		2	2	0	0	2	0	0	1	1	1	1	1	0
TRANSPORTATION AND LAND USE																			
STRATEGY 1. FACILITATE SUSTAINABLE TRANSPORTATION AND LAND USE PLANNING																			
TR-1.1	Reduce VMT from new development in compliance with SB 743.	TR-1.1.1	Enforce the City's requirements for SB 743, which mandate a 15% reduction in new project-generated VMT.	18	6	0		2	2	1	2	0	0	1	1	1	1	0	1
		TR-1.1.2	Continuously update VMT policy and implementation tools to further reduce VMT.	18	6	0		2	2	1	2	0	0	1	1	1	1	0	1
TR-1.2	Reduce VMT from existing development.	TR-1.2.1	Work with local employers to provide subsidies to employees for using transit or active transportation to commute to work, and encourage flexible work schedules (e.g., 9/80s and 4/10s) as well as tele-commuting.	20	6		2	2	2	1	2	0	2	1	1	0	0	0	1
		TR-1.2.2	Partner with local businesses to provide discounts or rewards programs to incentivize using transit or active transportation to travel to businesses.	20	6		2	2	2	1	2	0	2	1	1	0	0	0	1
		TR-1.2.3	Require employers of 50 or more employees to implement vehicle trip reduction programs and limit car commutes to 40% of their workforce by 2030.	17	6	0		2	2	1	1	0	2	1	1	0	0	0	1
		TR-1.2.4	Adopt and phase a citywide TDM ordinance by 2023, building on recommendations of the Metro Specific Plan and incorporate TDM ordinance into the Zoning Ordinance Update (anticipated in 2025).	16	6	0		2	2	1	2	0	0	1	1	0	0	0	1
		TR-1.2.5	Implement existing TDM plans, such as The District at Milpitas Lot 3A TDM Plan.	15	6	0		2	2	1	1	0	0	1	1	0	0	0	1
TR-1.3	Continue to implement and adopt policies that support high-density, mixed-use, transit oriented development, and housing near jobs	TR-1.3.1	Facilitate the development of complete streets and neighborhoods.	19	4	0		2	2	0	2	1	2	1	1	1	1	1	1
		TR-1.3.2	Maintain and continue to improve regional arterials within the City.	17	4	0		2	2	1	2	0	0	1	1	1	1	1	1
		TR-1.3.3	Promote and facilitate the creation of an innovation district within Metro Specific Plan Area to provide more jobs near transit and housing.									0	0	0	0	0	0	0	0
		TR-1.3.4	Support high levels of ridership at the Milpitas BART station by encouraging higher density, mixed uses, and connectivity along transit corridors and at transit nodes.	14	6	2		2	2	0	2	0	0	0	0	0	0	0	0
		TR-1.3.5	Promote dense development in central locations and along transportation corridors. Support Redevelopment of older commerical or gateway areas (Main Street and Calaveras) to intensify development and a mix of uses along major transit corridor.	14	6	2		2	2	0	2	0	0	0	0	0	0	0	0
		TR-1.3.6	Promote the increase of density and mixed uses in key opportunity areas.	12	4	2		2	2	0	2	0	0	0	0	0	0	0	0
		TR-1.3.7	Encourage development of urban plazas in new development in the Milpitas Metro Specific Plan, Midtown Specific Plan, and town center areas to encourage pedestrian activity and vibrant mixed-use centers that reduce vehicular activity.	12	4	2		2	2	0	2	0	0	0	0	0	0	0	0
TR-1.4	Explore car-free zones or shared streets in appropriate areas	TR-1.4.1	Explore car-free zones in commercial hubs such as those identified in the Midtown Specific Plan and Metro Specific Plan areas.	9	4	0		0	0	1	1	0	0	1	1	0	0	0	1
STRATEGY 2. DECARBONIZE VEHICLES																			
TR-2.1	Increase EV charging infrastructure.	TR-2.1.1	Work with SVCE and other partners to provide incentives and increase EV charging stations in visible, accessible, shared locations such as mixed-use development or accessible to multi-family renters.	21	8	0	2	2	0	1	1	0	2	1	1	1	1	1	0
		TR-2.1.2	With each Title 24 and CalGREEN code cycle, adopt updated EV charging station standards for all new development through the City's reach codes that go beyond State requirements. Require at least 50 percent of parking spaces in new development to be EV-ready/EVSE installed by 2030.	20	8	0		2	2	1	1	1	0	1	1	0	1	1	1
		TR-2.1.3	Provide rebates and other incentives to home and business owners to install EV chargers.	20	8		2	2	0	1	1	1	2	1	1	0	1	0	0
		TR-2.1.4	Ensure EV charging stations are encouraged and allowed through land use designations that currently permit gas fueling stations.	13	8	0		2	0	1	2	0	0	0	0	0	0	0	0
TR-2.2	Increase EV and low-carbon vehicle adoption.	TR-2.2.1	Improve awareness of local, regional, and State incentives for low- and zero-emission vehicles and increase EV purchases in Milpitas through events and resource promotion such as through Climate Action Milpitas Dashboard.	18	8		2	2	2	0	2	0	2	0	0	0	0	0	0
		TR-2.2.2	Partner with the BAAQMD, Joint Venture Silicon Valley, and the Silicon Valley Clean Cities Coalition to pursue funding for EV deployment projects in the city.	17	8	2		2	2	1	2	0	0	0	0	0	0	0	0
		TR-2.2.3	Include a provision in the next contract with the City's solid waste franchise hauler that they use alternative fuel vehicles for the fleet which services Milpitas.	16	8	0		2	0	1	1	0	2	1	1	0	0	0	0
		TR-2.2.4	Partner with Acterra and its GoEV Program to deploy a public outreach campaign that gives the public opportunities to drive EVs and provides EV education.	15	8	0	0	2	0	1	2	0	2	0	0	0	0	0	0
		TR-2.2.5	Adopt an ordinance that phases out development of new gasoline and diesel fuel stations as the market shifts to fossil fuel free vehicles.	14	8	0		0	0	1	1	0	2	1	1	0	0	0	0
		TR-2.2.6	Provide incentives to convert vehicle fleets (e.g., rental, private, school) in the city.	12	8		2	0	0	1	1	0	0	0	0	0	0	0	0
TR-2.3	Reduce vehicle idling.	TR-2.3.1	Adopt ordinances to limit idling at institutions and businesses to reduce the impacts of vehicle idling on adjacent uses, such as housing, schools, and health care facilities.	14	4	0		2	0	1	2	0	2	1	1	0	0	0	1
		TR-2.3.2	Discourage the construction of new drive-throughs in the Milpitas Metro Specific Plan.	12	4	0		2	0	1	2	0	0	1	1	0	0	0	1
		TR-2.3.3	Require all new nonresidential development with loading docks to supply sufficient electrical power for delivery trucks and associated equipment to reduce idling when making deliveries.	9	4		0	0	0	1	1	0	0	1	1	0	0	0	1
TR-2.4	Reduce the amount of parking such that it meets the needs of residents, workers, and visitors in a way that is consistent with the City's sustainability goals.	TR-2.4.1	Revise development standards for multi-family and mixed-use developments to separate parking costs from the cost to rent, purchase, or lease residential and nonresidential buildings.	16	4		2	0	2	1	1	1	2	1	1	0	0	0	1
		TR-2.4.2	Revise development standards to eliminate or reduce the minimum parking requirements for new development and redevelopment of nonresidential buildings and mid- to higher-density residential development.	14	4	0	0	2	2	1	2	0	0	1	1	0	0	0	1
		TR-2.4.3	Develop and require parking maximums at new development.	9	4	0	0	0	0	1	1	0	0	1	1	0	0	0	1
STRATEGY 3. INCREASE ACTIVE AND PUBLIC TRANSPORTATION USE																			

TR-3.1	Enhance and expand transit facilities and infrastructure.	TR-3.1.1	Implement the Milpitas OnDemand "hub-and-spoke" micro-transit pilot program, including on-demand shuttle service for first- and last-mile connections to existing transit hubs such as the BART station and VTA light rail stops.	22	6		2	2	2	1	2	0	2	1	1	1	0	1	1
		TR-3.1.2	Ensure a pedestrian-friendly environment around the BART and light rail transit stations.	19	6		2	2	0	1	2	0	2	1	1	1	0	0	1
TR-3.2	Increase transit ridership.	TR-3.2.1	Work with transit agencies to provide free or subsidized transit to low-income residents, expanding to all residents by 2030.	21	6		2	2	2	1	1	0	2	1	1	1	0	1	1
		TR-3.2.2	Improve reliability and convenience of existing transit services through increased frequency, expanded service areas, extended service hours, and better facilities.	17	6	0		2	0	1	1	0	2	1	1	1	0	1	1
TR-3.3	Improve active transportation options.	TR-3.3.1	Require all new development other than single family to provide short-term and long-term bicycle parking facilities to meet peak season maximum demand.	17	4		0	2	2	1	2	1	2	1	1	0	0	0	1
		TR-3.3.2	Increase awareness of existing City initiatives to facilitate active transportation, including Bike Paths maps and Suggested Routes to School Program maps.	17	4	2		2	2	0	2	0	2	1	1	0	0	0	1
		TR-3.3.3	Require new nonresidential developments projects to provide "end-of-trip" facilities for cyclists, including showers, secure bicycle lockers, and changing spaces.	14	4		0	2	0	1	2	0	2	1	1	0	0	0	1
		TR-3.3.4	Require new nonresidential developments have adequate e-bike and e-scooter infrastructure and options.	13	4		0	2	0	1	1	0	2	1	1	0	0	0	1
		TR-3.3.5	Implement the updated Trail, Pedestrian, and Bicycle Master Plan to enhance and expand bicycle and pedestrian infrastructure and networks.	19	4	2		2	2	1	1	0	2	1	1	1	1	0	1
OFF-ROAD VEHICLES AND EQUIPMENT																			
STRATEGY 1. SHIFT TO CLEAN OFF-ROAD EQUIPMENT AND VEHICLES																			
OT-1.1	Reduce landscaping-related emissions.	OT-1.1.1	Promote regional and State incentive programs to encourage residents and business owners to convert or replace their fossil fuel-powered gardening equipment, such as lawn mowers, leaf blowers, and edge trimmers, with electric alternatives.	15	4		2	2	2	0	2	1	2	0	0	0	0	0	0
		OT-1.1.2	Adopt an ordinance that prohibits the sale of fossil fuel-powered landscaping equipment by 2024 to transition to zero-emission landscaping equipment.	13	4	0		2	2	1	1	0	0	1	1	0	0	0	1
		OT-1.1.3	Require all new development to install sufficient exterior electrical outlets to charge electric-powered landscaping equipment.	9	4	0	0	2	0	1	2	0	0	0	0	0	0	0	0
OT-1.2	Reduce construction-related emissions.	OT-1.2.1	Reduce idling of construction vehicles and equipment.	15	4		2	2	0	1	1	0	2	1	1	0	0	0	1
		OT-1.2.2	Prohibit the use of fossil fuel-powered generators at construction sites in all new discretionary projects.	10	4		0	0	0	1	0	0	2	1	1	0	0	0	1
		OT-1.2.3	Require all construction projects to use renewable diesel in diesel-powered construction equipment.	10	4		0	0	0	1	1	0	2	1	1	0	0	0	0
SOLID WASTE																			
STRATEGY 1. ACHIEVE ZERO WASTE																			
SW-1.1	Eliminate the disposal of organic solid waste in landfills.	SW-1.1.1	Require local restaurants to compost food waste, consistent with SB 1383.	13	6	0		2	2	1	1	0	0	0	0	0	0	0	1
		SW-1.1.2	Expand existing organic waste collection routes and drop-off sites to improve composting services for interested residents and businesses.	13	6	0		2	2	1	2	0	0	0	0	0	0	0	0
		SW-1.1.3	Implement and enforce the requirements of SB 1383 and eliminate disposal of compostable organic materials to landfills.	19	8	0		2	2	1	2	1	0	0	0	0	1	1	1
SW-1.2	Increase recycling and the diversion of other inorganic solid waste.	SW-1.2.1	Partner with RecycleStuff.org to enhance awareness of local and regional recycling opportunities.	14	6	2		2	2	0	2	0	0	0	0	0	0	0	0
		SW-1.2.2	Adopt an ordinance that requires recycling and composting services, the use of only recyclable and compostable materials by vendors, and adequate staff to ensure proper disposal and recycling at events that require a City-issued permit.	12	6	0		2	0	1	2	0	0	0	0	0	0	0	1
		SW-1.2.3	Partner with waste haulers to expand the diversion of non-food, non-construction, and non-demolition solid waste.	11	6	0		0	2	1	1	0	0	0	0	0	0	0	1
SW-1.3	Reduce the generation of waste from residents and businesses.	SW-1.3.1	Enforce the City's plastic bag and Styrofoam ban.	14	6	0		2	2	1	2	0	0	0	0	0	0	0	1
		SW-1.3.2	Encourage local businesses to reduce the use of single-use, non-biodegradable products, and support the establishment of a regional ordinance that restricts and/or limits the use of these products by local businesses.	14	6	2		2	2	0	2	0	0	0	0	0	0	0	0
		SW-1.3.3	Require organizations over 50 employees to implement organization wide waste reduction initiatives.	12	6	0		2	0	1	2	0	0	0	0	0	0	0	1
		SW-1.3.4	Promote responsible consumption of products and materials.	12	6	2		2	0	0	2	0	0	0	0	0	0	0	0
		SW-1.3.5	Coordinate with other local jurisdictions and landfills to implement a divertible materials (e.g., recyclables) ban at landfills.	11	6	0		2	0	1	1	0	0	0	0	0	0	0	1
SW-1.4	Reduce the generation of construction and demolition waste.	SW-1.4.1	Amend the building demolition permit requirements and adopt a comprehensive construction and demolition ordinance to reach a 75% diversion rate.	15	6	0		2	2	1	1	0	0	1	1	0	0	0	1
SW-1.5	Facilitate repair and reuse of consumer products.	SW-1.5.1	Develop a reuse facility that makes building materials available to customers, and acts as an outlet for reusable items otherwise destined for landfill.	17	6	0	2	2	0	1	1	0	2	0	0	0	1	1	1
		SW-1.5.2	Create and support "fix-it clinics" at Parks and Recreation facilities and other City buildings that can build skills among local businesses and residents in innovation, repair, and reuse.	17	6	0	2	2	0	1	1	0	2	0	0	0	1	1	1
		SW-1.5.3	Support Extended Producer Responsibility initiatives that drive end of product life management.	12	6	2		2	0	0	2	0	0	0	0	0	0	0	0
		SW-1.5.4	Promote redesign of products so that they do not require end of life disposal, but are incorporated back into useful products.	12	6	2		2	0	0	2	0	0	0	0	0	0	0	0
WATER AND WASTEWATER																			
STRATEGY 1. PROMOTE RESILIENT WATER SUPPLY, WATER USE, AND WATER RESOURCES																			
WA-1.1	Reduce indoor water consumption in buildings.	WA-1.1.1	Increase residential and nonresidential participation in the High Efficiency Clothes Washer Rebate Program and the High Efficiency Toilet Rebate Program by ensuring continued funding to the City's Water Conservation Program, operated in conjunction with resources provided by SCVWD and BAWSCA.	17	4	0	2	2	2	1	1	1	2	0	0	0	1	0	1
		WA-1.1.2	Collaborate with San Francisco Public Utilities Commission (SFPUC) and Santa Clara Valley Water District (SCVWD) to develop a retrofit program to encourage installation of water conservation measures in existing businesses and residences.	17	4	0	2	2	2	1	1	1	2	0	0	0	1	0	1
		WA-1.1.3	Regularly review and update the City's Water Conservation Ordinance and water conservation measures to be consistent with current best management practices and ensure effective and ongoing conservation efforts.	15	4	2		2	2	1	2	0	0	0	0	0	1	0	1
		WA-1.1.4	Continue water conservation efforts outlined in the 2021 Urban Water Management Plan (UWMP).	15	4	2		2	2	1	2	0	0	0	0	0	1	0	1
		WA-1.1.5	Require ultra-low-flow fixtures in new residential and nonresidential development.	13	4		2	2	0	1	2	0	0	0	0	0	1	0	1
		WA-1.1.6	Continue to assess and manage distribution system losses through efforts including replacing existing meters with smart meters, implementing a Supervisory Control and Data Acquisition (SCADA) system, replacing selected water pipe with upgraded design criteria to withstand seismic events, and maintaining an active cathodic protection system.	13	4	0		2	2	1	2	0	0	0	0	0	1	0	1
		WA-1.1.7	Coordinating with SFPUC and SCVWD, facilitate the development of a water auditing program for existing residential and nonresidential development.	11	4	0	0	2	0	0	2	1	2	0	0	0	0	0	0
WA-1.2	Reduce water consumption for irrigation and landscaping.	WA-1.2.1	Continue to fund and operate the City's Water Conservation Program in conjunction with resources provided by Valley Water and BAWSCA, including the Irrigation Equipment Upgrades Rebate Program, Landscape Conversion Rebate Program, Water Wise Survey Program, and Water Efficient Gardening workshops.	18	4	0	2	2	2	1	2	1	2	0	0	0	1	0	1
		WA-1.2.2	Increase residential and nonresidential participation in the Landscape Conversion Rebate and Irrigation Equipment Upgrades programs to convert lawns to a healthy habitat with native and drought-tolerant species that use water-efficient irrigation equipment.	17	4	0	2	2	2	1	1	1	2	0	0	0	1	0	1
		WA-1.2.3	Implement and enforce the Water Efficient Landscape Ordinance and the Water Conservation Ordinance.	13	4	0		2	2	1	2	0	0	0	0	0	1	0	1
		WA-1.2.4	Require drought tolerant, water conserving, and/or native landscaping in new development and redevelopment projects.	11	4	0	0	2	0	1	2	0	0	0	0	0	1	0	1
WA-1.3	Increase the use of recycled water and support efforts to drought proof our water supply.	WA-1.3.1	Increase residential and nonresidential participation in the Rainwater Catchment Rebate and Graywater Laundry to Landscape Rebate programs to utilize rainwater and graywater for landscaping and irrigation purposes.	15	4		2	2	0	1	1	1	2	0	0	0	1	0	1
		WA-1.3.2	Continue to require all commercial and industrial development south of the Hetch Hetchy right-of-way to install recycled water lines and require conversion of landscape irrigation to recycled water, as feasible.	15	4	2	0	2	2	1	2	0	0	0	0	0	1	0	1
		WA-1.3.3	Support use of recycled water as drought proof water supply including potential indirect potable recharge	14	4			2	2	0	0	1	2	0	0	1	1	0	1
		WA-1.3.4	Encourage the use of recycled water for industrial uses and landscape irrigation where feasible, within the parameters of State and County Health Codes and standards and in compliance with regional agency requirements.	12	4	2		2	2	0	2	0	0	0	0	0	0	0	0
		WA-1.3.5	Encourage residents and businesses to install on-site recycled water systems (i.e., greywater systems) and rainwater harvesting systems, consistent with all State and County Health Codes and standards and in compliance with regional water agency requirements.	12	4	2		2	2	0	2	0	0	0	0	0	0	0	0
		WA-1.3.6	Require all new residential and nonresidential development to include a separate piping system for recycled water (i.e. "purple pipes") to be used for irrigation and other outdoor water uses, as feasible.	8	4	0	0	0	0	1	1	0	0	0	0	0	1	0	1
CARBON SINKS																			
STRATEGY 1. RESILIENT INFRASTRUCTURE AND HEALTHY FOREST AND NATURAL SYSTEMS																			
CS-1.1	Protect native trees and vegetation and enhance carbon sequestration.	CS-1.1.1	Based on the recommendations from the City's Urban Forestry Management Plan, implement a tree planting program to expand the city's urban forest canopy.	18	4	0		2	2	2	1	0	2	1	1	0	1	1	1
		CS-1.1.2	Develop and implement a street tree planting program for residential neighborhoods.	18	4	0		2	2	2	1	0	2	1	1	0	1	1	1
		CS-1.1.3	Identify high priority areas for civic tree planting activities that provide the greatest benefits to the community and provides urban canopy coverage in areas of the city that are currently underserved by street trees and trees within public spaces.	16	4	2		2	2	2	2	0	2	0	0	0	0	0	0
		CS-1.1.4	Make available a list of plants and trees native to the region that are suitable for use in landscaping, consistent with the requirements of Milpitas' Water Efficient Landscape Ordinance (WELO).	16	4	2		2	2	2	2	0	0	0	0	0	1	0	1
		CS-1.1.5	Update Milpitas' Tree Protection Regulations as specified in the General Plan. - Establish additional criteria and findings that need to be met prior to removing a protected or heritage tree. - Provide more detailed tree replacement requirements to address the aesthetic loss, habitat value, and economic value of the tree being removed. - Enhance the penalties for unpermitted tree removals. - Consider adding additional tree species to the list of locally protected tree species (particularly native species). - Establish criteria for construction practices to protect existing high value trees to the greatest extent feasible.	16	4	0		2	2	1	1	0	2	1	1	0	1	0	1
		CS-1.1.6	Identify thresholds for new development mitigation for the provision of parks or open space.	13	4	2		2	2	1	2	0	0	0	0	0	0	0	0
		CS-1.1.7	Identify natural areas that could be obtained and preserved through land transfers and acquisitions of undeveloped/unprotected private and public lands.	11	4	2		2	0	2	1	0	0	0	0	0	0	0	0
		CS-1.2.1	Amend the Zoning Code to create tree planting standards for new and renovated development; require the planting of two trees in single-family development in the front, side, or rear yard as feasible; and create lineal landscaping standards for commercial development that identify a minimum number of tree plantings based on lineal frontage length.	17	4	0	0	2	2	1	2	0	2	1	1	0	1	0	1

CS-1.2	Reduce the urban heat island effect to conserve energy.	CS-1.2.2	Require all new development to install cool pavements, plant low-maintenance and drought-tolerant landscaping, and plant shade trees.	17	4	0	0	2	2	1	2	0	2	1	1	0	1	0	1
		CS-1.2.3	Reduce heat gain from surface parking lots in new development for a minimum of 50% of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance.	16	4	0		2	2	1	1	0	2	1	1	0	1	0	1
CS-1.3	Increase the use of green infrastructure.	CS-1.3.1	Develop and implement a green infrastructure program for the installation and maintenance of projects and existing public resources, such as the parks system and other open spaces.	18	4	0		2	2	2	1	0	2	1	1	0	1	1	1
		CS-1.3.2	Review Capital Improvement Program projects to identify opportunities for green infrastructure.	16	4	2		2	2	2	2	0	0	0	0	0	1	0	1
		CS-1.3.3	Develop guidelines for the inclusion of green infrastructure in the design of transportation improvements.	13	4	0		2	2	2	1	0	0	0	0	0	1	0	1
		CS-1.3.4	Encourage the use of green roofs on existing and new development.	12	4	2		2	2	0	2	0	0	0	0	0	0	0	0
CS-1.4	Increase soil carbon content.	CS-1.4.1	Develop a healthy soil strategy for the city to support urban agriculture, address carbon sequestration, and increase water capture.	11	4	0		2	0	2	1	0	0	0	0	0	1	0	1
CS-1.5	Use low-carbon and carbon sequestering construction materials in new development.	CS-1.5.1	Adopt standards to require the use of pervious paving materials in plazas, in addition to the provision of mature landscaping and other strategies that will maximize carbon sequestration.	13	4	0		2	2	1	2	0	0	0	0	0	1	0	1
		CS-1.5.2	Require building materials that store carbon (e.g., wood, calcium carbonate-based cementitious substances, synthetic limestone) in all nonresidential construction.	6	4		0	0	0	1	1	0	0	0	0	0	0	0	0
CIRCULAR AND GREEN ECONOMY																			
STRATEGY 1. Foster Green and Sustainable Economic Development Opportunities																			
GE-1.1	Support and attract clean technology businesses and green jobs in Milpitas.	GE-1.1.1	Partner with local and regional agencies and educational institutions to offer courses/training that prepare students/workers for green jobs, such as the Milpitas Adult School Program, South Bay Consortium for Adult Eduction, Center for Employment Training in San Jose and PG&E's on-demand energy trainings.	18	6	0		2	2	1	2	1	2	0	0	0	1	1	0
		GE-1.1.2	Develop a Green Business Strategic Plan to support environmentally friendly business development in Milpitas.	13	4	0	2	2	2	1	1	0	0	0	0	0	0	1	0
		GE-1.1.3	Collaborate regionally to conduct outreach and training with local contractors and businesses on electrification. - SVCE Future Fit Fundamentals and Rising Sun Program; Built It Green	13	4	2		2	0	1	1	0	2	0	0	0	0	1	0
		GE-1.1.4	Explore the feasibility of creating an eco-innovation district: a vibrant, mixed-use neighborhood committed to advancing sustainability, resilience, and equity through targeting a variety of performance areas, such as access and mobility, appropriate development, community health and well-being, energy, water, and materials management.	7	4	2		0	0	0	1	0	0	0	0	0	0	0	0
GE-1.2	Incentivize and promote green business practices.	GE-1.2.1	Promote green tenant and leasing practices for commercial businesses. Examples include the Green Tenant Toolkit developed by the Business Council on Climate Change and San Francisco Environment.	14	4	2		2	0	0	2	1	2	0	1	0	0	0	0
		GE-1.2.2	Develop and implement marketing and technical assistance to green businesses, and consider developing incentives such as reduced business license taxes/fees.	12	4	0	2	2	0	1	1	0	2	0	0	0	0	0	0
		GE-1.2.3	Develop a Clean Energy Pledge for area businesses to bring visibility to those businesses already purchasing carbon-free electricity or pledging to do so in the future. In collaboration with SVCE	11	4	2		2	0	1	2	0	0	0	0	0	0	0	0
STRATEGY 2. SUPPORT CIRCULAR ECONOMY POLICIES																			
GE-2.1	Engage with circular economy and zero waste policymaking at the Federal, State, and local levels.	GE-2.1.1	Support regional and State legislation intended to reduce GHG emissions from waste and virgin materials use and promote recyclability and repairability of products.	10	4	2		2	0	0	2	0	0	0	0	0	0	0	0

Prioritization Framework

All actions are prioritized based on timeline (when they should be implemented - near, mid, long term)

Criteria	Description and Score		
GHG Emissions Reduction Potential	Small - The action has a small (between 0%-2%) greenhouse gas reduction potential. 4	Medium - The action has a medium (between 3%-5%) greenhouse gas reduction potential. 6	High - The action has a high (over 5%) greenhouse gas emissions reduction potential. 8
City Cost Effectiveness	Costs Outweigh Benefits - Implementation costs slightly outweigh the long-term financial benefits. -2	Benefits Match Costs - Long-term financial benefits match implementation costs OR don't know the overall cost effectiveness of the action. 0	Benefits Outweigh Costs - Long-term financial benefits outweigh implementation costs. 2
Residential and Business Cost Effectiveness	Cost Outweigh Benefits - Long-term financial benefits do not outweigh implementation costs. -2	Benefits Match Costs - Long-term financial benefits match implementation costs OR don't know the overall cost 0	Benefits Outweigh Costs - Long-term financial benefits outweigh implementation costs. 2
Technological/ Implementation Feasibility	No - Technology is not readily available and is not on track to be deployed in the specified -2	Maybe - Technology is on track to be deployed in the specified timeframe OR don't know about the status of the technology. 0	Yes - Technology needed currently exists. 2
Current Policies or Ordinances	No - Policies or ordinances currently exist that prohibit this action. -2	Maybe - Policies or ordinances would need to be developed to support this action OR don't know if policies or ordinances 0	Yes - Policies or ordinances currently exist that support this action. 2
Jurisdictional Control	No - City is the influencer. 0	Maybe - City is the regulator. 1	Yes - City is the actor. 2
Implementation Timeframe	6+ Years - Action could be operational after 6+ years. 0	3-5 Years - Action can be operational in the next 3 to 5 years. 1	1-2 Years - Action can be operational in the next 1 to 2 years. 2
Co-Benefits			
Benefits to Renters		No - This action does not benefit who rent their home to see the cost savings of energy efficiency upgrades, improvements 0	Yes - This action benefits residents who rent their home to see the cost savings of energy efficiency 1
Equity		No - This action neither enhances nor decreases health and racial equity through improved quality of life, access to 0	Yes - This action enhances health and racial equity through improved quality of life and access to 2
Air Pollution Prevention		pollutant emissions OR don't know what impact this action has on local or regional criteria pollutant emissions at location of 0	Yes - This action minimizes local or regional criteria pollutant emissions at the location of implementation. 1
Health and Well-Being		No - This action does not influence public health OR don't know 0	Yes - This action enhances public health. 1
Reliability		transportation system, emergency response, etc. OR don't know the impact on reliability. 0	Yes - Action helps increase reliability of the electrical grid, transportation system, emergency response, etc. 1
Resilience		No - Action does not impact the resilience of the City, people, and ecosystems to climate-related disruptions OR don't know 0	Yes - Action increases the resilience of the City, people, and ecosystems to climate-related 1
Job Development		No - Action does not influence job creation in Milpitas OR don't 0	Yes - Action maximizes quality job creation in Milpitas. 1
Resource Preservation		No - Action does not impact greenspaces/prime habitat OR 0	Yes - Action helps preserve greenspaces/prime 1
		Maximum Potential Score	29

Implementing Agencies

County Administration Office	CAO
Innovation and Business Assistance Dep	IBA
Office of Emergency Services	OES
Community Development Department	CDD
Air Pollution Control District	APCD
Health and Human Services	HHS
Fire Department	TCFD
Emergency Medical Services	EMS
Agricultural Commissioner	AC
Public Services Department	PSD

													COBENEFITS							
MEASURE NUMBER	MEASURE	ACTION NUMBER	ACTION	PRIORITIZATION SCORE	Climate Resilience Potential	City Cost Effectiveness	Residential and Business Cost Effectiveness	Technological/ Implementation Feasibility	Current Policies or Ordinances	Jurisdictional Control	Implementation Timeframe	Benefits to Renters	Equity	Air Pollution Prevention	Health and Well-Being	Reliability	GHG Mitigation	Job Development	Resource Preservation
STRATEGY 1. Resilient Communities and Equity and Environmental Justice																			
1.1	Increase community resilience to impacts from air pollution.	1.1.1	Develop outreach program to educate vulnerable communities and residents in general on strategies to protect themselves from air pollution exacerbated by climate change including impacts from wildfire smoke.	15	6	0	0	2	0	2	2	0	2	0	1	0	0	0	0
		1.1.2	Establish or support development of community centers and/or other locations indoors for individuals experiencing homelessness or other vulnerable populations to seek refuge during periods of high air pollution.	11	6	0	0	0	0	1	1	0	2	0	1	0	0	0	0
		1.1.3	Coordinate with partner organizations to communicate measures to protect residents and workers during high ozone and high particulate matter days.	10	4	0	0	2	0	0	2	0	2	0	0	0	0	0	0
1.2	Increase community resilience to respond to and recover from widespread health emergencies.	1.2.1	Consider the overall preparedness of the community to respond to and recover from widespread health emergencies and develop programs and activities designed to increase resilience and self-sufficiency.	15	8	2	0	2	0	2	1	0	0	0	0	0	0	0	0
		1.2.2	Partner with the Milpitas Unified School District and other community organizations to develop programs and activities designed to help individuals, families, and community groups prepare for and respond effectively to widespread health emergencies.	8	4	0	0	2	0	0	1	0	0	0	1	0	0	0	0
		1.2.3	Collaborate with federal, State, regional, and local partners to implement programs to help prevent vector and waterborne diseases.	6	4	0	0	0	0	0	1	0	0	0	1	0	0	0	0
1.3	Protect populations vulnerable to extreme heat.	1.3.1	Work with City departments to identify specific locations in the city with populations vulnerable to heat-related illness (e.g., elderly populations, high-rates of cardiovascular disease).	15	6	2	0	2	0	2	1	0	2	0	0	0	0	0	0
		1.3.2	Develop targeted outreach campaign with supporting materials to raise awareness about heat risks. Ensure that extreme heat preparedness and response information is available in the primary non-English languages spoken in the community.	17	8	0	0	2	0	2	2	0	2	0	1	0	0	0	0
1.4	Increase community awareness of climate change.	1.4.1	Promote community awareness of climate-resilient actions that can be implemented by homeowners, such as water conservation, on-site water collection, passive solar designs, and alternative energy strategies.	11	6	0	0	0	2	1	1	0	0	0		0	1	0	0
		1.4.2	Collaborate with federal, State, regional, and local partners to develop a community-wide outreach program to educate diverse communities on how to prepare and recover from the various impacts of climate change likely to affect the city.	13	8	0	0	2	0	2	1	0	0	0	0	0	0	0	0
1.5	Ensure that climate impacts and climate adaptation measures aimed at reducing climate risks do not lead to disproportionally adverse effects on vulnerable populations.	1.5.1	Identify high priority areas for civic tree planting activities that provide the greatest benefits to the community and provides urban canopy coverage in areas of the city that are currently underserved by street trees and trees within public spaces.	14	4	0	0	2	2	2	2	0	2	0	0	0	0	0	0
1.6	Improve mobility among vulnerable populations and individuals.	1.6.1	Consider the needs of vulnerable populations and individuals with limited mobility when planning for access to safe and comfortable shelter during extreme heat events or other severe weather events.	14	6	0	0	2	2	2	2	0	0	0	0	0	0	0	0
		1.6.2	Encourage and support local transit service providers to increase and expand services for people who are transit-dependent, including seniors, persons with mobility disabilities, and persons without regular access to automobiles by improving connections to regional medical facilities, senior centers, and other support systems that serve residents and businesses.	12	4	0	0	2	2	0	1	0	2	0	0	1	0	0	0
		1.6.3	Support and encourage the expansion of paratransit and public transit service to neighborhood and regional medical facilities.	13	6	0	0	2	2	0	1	0	2	0	0	0	0	0	0
1.7	Ensure completeness and availability of emergency supplies and resources to all segments of the population, focusing especially on vulnerable populations and individuals.	1.7.1	Explore opportunities to construct additional community facilities. The facilities should be geographically distributed to accommodate underserved areas of the City and include spaces that can be rented by residents and community groups.	14	4	0	0	2	2	2	0	1	2	0	1	0	0	0	0
		1.7.2	Encourage services and programs that meet the unique needs of seniors within Milpitas, including the establishment of medical facilities, transportation options for seniors and people with mobility disabilities, senior centers, and programs that provide for in-home care and aging-in-place.	17	6	0	0	2	2	1	2	0	2	0	1	0	0	1	0
		1.7.3	Support health care facilities and services that assist underserved populations, including minorities, disabled persons, and the homeless community.	18	8	0	0	2	2	0	2	0	2	0	1	0	0	1	0
		1.7.4	Recognize that not-for-profit health care providers, clinics, and permanent supportive housing provide a valuable resource and appropriate medical care for the community, including vulnerable populations.	16	4	2	0	2	2	2	2	0	2	0	0	0	0	0	0
		1.7.5	Continue to promote public safety through public education programs, and ensure programs are available and accessible to all segments of the community.	19	6	2	0	2	2	2	2	0	2	0	1	0	0	0	0
		1.7.6	Coordinate with local homeless services to ensure that emergency shelters are available during extreme heat events, poor air quality, severe weather events, and other highly hazardous conditions. Ensure that the local homeless population is made aware of these resources.	15	8	0	0	2	0	0	2	0	2	0	1	0	0	0	0
STRATEGY 2. Resilient Transportation Systems and Resilient Energy Resources																			
2.1	Integrate climate change considerations in all transportation agency planning and decision-making processes.	2.1.1	Update maintenance protocols to incorporate projected climate change effects and evaluate the potential for increased frequency or need to maintain transportation infrastructure, specifically from extreme heat and increased frequency of flooding events.	18	8	2	0	2	2	2	1	0	0	0	0	1	0	0	0
		2.1.2	Use the best available science to update design standards for future development and maintenance of transportation infrastructure and capitol improvement projects that incorporate future projections for more intense heat wave events.	16	8	2	0	2	0	2	1	0	0	0	0	1	0	0	0
		2.1.3	Coordinate with regional transportation agencies to ensure redundancy of critical transportation routes to allow for continued access and movement in the event of an emergency.	10	8	0	0	0	0	0	1	0	0	0	0	1	0	0	0
2.2	Reduce local flooding impacts to transportation infrastructure.	2.2.1	Develop guidelines for the inclusion of green infrastructure in the design of transportation improvements.	17	6	0	0	2	2	2	0	0	0	1	1	1	1	0	1
		2.2.2	Update the City's Streetscape Master Plan to require drought-tolerant plantings consistent with the requirements of Milpitas' Water Efficient Landscape Ordinance (WELO) and Green Stormwater Infrastructure (GSI) elements such as pervious pavers, bioretention areas and stormwater tree filters should be included where possible, consistent with the City's Green Stormwater Infrastructure (GSI) Plan.	17	6	0	0	2	2	2	0	0	0	1	1	1	1	0	1
2.3	Increase the resilience of existing residential and commercial development through energy efficiency upgrades and onsite energy generation and storage.	2.3.1	Transition all city-owned buildings to use 100 percent renewable sources of electricity and install onsite carbon-free backup power supplies to make City operations grid independent during PSPS events.	16	8	2	0	0	0	2	1	0	0	1	0	1	1	0	0
		2.3.2	Promote decentralization of energy supplies and energy storage capacity for residents and businesses to improve energy independence (i.e., microgrids and battery storage).	14	8	0	0	0	0	1	0	0	0	1	1	1	1	1	0
2.4	Minimize stress on the electrical grid.	2.4.1	Facilitate the adoption of smart grid and other peak load reduction technologies, such as building energy management systems and smart appliances, within new and existing buildings.	16	6	2	2	2	0	0	1	1	0	0	0	1	1	0	0
		2.4.2	Encourage distributed energy resources including solar, fuel cells etc. to provide environmental benefits, as well as energy security, and the support of the grid during peak energy use periods.	15	6	0	0	2	2	1	1	0	0	0	0	1	1	1	0
		2.4.3	Collaborate with utility providers to ensure that infrastructure and resource management plans account for anticipated climate change impacts.	13	8	0	0	0	2	0	1	1	0	0	0	1	0	0	0
2.5	Protect critical energy and telecommunications infrastructure and systems from climate change.	2.5.1	Require that all new power and gas lines and transformers are installed underground where feasible and promote the undergrounding of existing overhead facilities.	11	6	0	0	2	0	1	0	0	0	0	0	1	1	0	0
		2.5.2	Ensure adequate utility system redundancy and fuel is available to maintain critical facilities during emergency events.	17	8	0	0	2	2	1	0	0	2	0	1	1	0	0	0
		2.5.3	Require that all new telecommunication lines are installed underground where feasible and promote the undergrounding of existing overhead facilities.	10	6	0	0	2	0	1	0	0	0	0	0	1	0	0	0
STRATEGY 3. Reduced Flooding																			
3.1	Minimize risks to life and property resulting from flooding and flood induced hazards.	3.1.1	Invest in use of pervious pavements and landscaping in developed areas to prevent localized flooding events during small and large storms.	12	6	0	0	2	2	1	0	0	0	0	0	1	0	0	0
		3.1.2	Continue to maintain good standing and compliance under the National Flood Insurance Program (NFIP). This will be accomplished through the implementation of floodplain management programs that will, at a minimum, meet the requirements of NFIP: Enforcement of the flood damage prevention ordinance. Participate in the floodplain identification and mapping updates. Provide public assistance/information on floodplain requirements and impacts.	20	8	2	0	2	2	1	0	1	2	0	1	1	0	0	0
		3.1.3	Evaluate and consider increasing the design criteria for current and future flood protection projects from 100-year flood events to higher impact flood events.	19	8	0	0	2	2	1	1	1	2	0	1	1	0	0	0
		3.1.4	Evaluate the need to increase pump station capacity and provide protection for pump stations.	18	8	2	0	2	2	2	1	0	0	0	0	1	0	0	0
3.2	Evaluate proposed development in areas of the City subject to flooding impacts caused by rising sea levels.	3.2.1	Require evaluation of projected inundation for development projects near San Francisco Bay or at flooding risk from local waterways which discharge to San Francisco Bay. For projects affected by increased water levels in San Francisco Bay, the City shall require incorporation of mitigation measures prior to the approval of the project.	19	8	2	2	2	2	1	1	0	0	0	0	1	0	0	0
3.3	Maintain up-to-date flood risk and hazard data.	3.3.1	Monitor information from regional, state, and federal agencies on water level rises in San Francisco Bay on an on-going basis. Use this information to determine if additional adaptive management actions are needed and implement those actions to address flooding hazards from increasing sea levels for existing or new development and infrastructure.	12	6	0	0	2	2	0	2	0	0	0	0	0	0	0	0
		3.3.2	Continuously monitor local and regional efforts to track sea level rise and the associated flood risks. Consider constructing facilities, such as flood walls and additional pump stations, to protect the City from flooding associated with sea level rise.	13	6	0	0	2	2	0	2	0	0	0	0	1	0	0	0
STRATEGY 4. Robust Emergency Services and Improved Disaster Recovery																			
		4.1.1	Identify community safety areas and evaluate existing locations that serve as temporary shelters or refuge during hazard events for resilience to future climate impacts.	14	8	2	0	0	0	1	0	1	2	0	0	0	0	0	0
		4.1.2	Collaborate with regional, State, and federal partners to ensure coordinated evacuation planning and ensure compliance with Senate Bill 99 and Assembly Bill 747 regarding evacuation route capacity and adequate egress points for subdivisions in the city.	10	8	0	0	0	0	0	0	0	0	0	0	1	1	0	0
		4.1.3	Establish resilience hub locations in neighborhoods throughout the community, equipped with backup power and disaster assistance and supplies.	18	8	2	0	2	0	1	1	0	2	0	1	1	0	0	0

4.1	Ensure that emergency services have adequate capacity to address increased demand due to climate change-related impacts.	4.1.4	Maintain up-to-date emergency preparedness and evacuation plans and procedures in coordination with appropriate state, regional, county, and local agencies and departments.	16	8	0	0	2	2	2	1	0	0	0	0	1	0	0	0
		4.1.5	Continue to maintain the City's Emergency Operations Center and conduct regular staff training exercises to ensure that all City staff members, in additional to emergency responders, are adequately trained to fulfill their duties in the event of an emergency.	18	8	0	0	2	2	2	0	0	2	0	1	1	0	0	0
		4.1.6	Conduct ongoing training for first responders and City personnel to ensure they have the necessary training and equipment to deal with climate-exacerbated hazards, including how to better serve vulnerable populations. Improve cultural competency of emergency services personnel in accordance with Senate Bill 160 in coordination with Santa Clara County Office of Emergency Management.	16	8	0	0	2	0	1	1	0	2	0	1	1	0	0	0
		4.1.7	Clearly communicate to the public the City's plans, procedures, and responsibilities in the event of a disaster or emergency. Communications and information made available to the public shall be provided in multiple languages to ensure the greatest number of community members have access to this information.	19	8	0	0	2	2	2	1	0	2	0	1	1	0	0	
		4.1.8	Encourage residents to register with the Santa Clara County Emergency Alert System (AlertSCC) to ensure notification in the event of an emergency.	16	8	0	0	2	2	2	0	0	0	0	1	1	0	0	0
		4.1.9	Develop Disaster Documentation Program to include tracking disasters affecting Milpitas, and tracking via photos damage incurred during and after disaster events. This data can be used for tracking and trending, and ultimately mitigation planning.	19	8	0	0	2	2	2	1	0	2	0	1	1	0	0	0
		4.1.10	Develop a debris management plan to aid in post-disaster recovery.	13	6	0	0	2	2	2	0	0	0	0	0	1	0	0	0
4.2	Provide effective, efficient, and immediately available Community Emergency preparedness programs response in the event of a natural or human-made disaster.	4.2.1	Encourage residents and community leaders to participate in disaster training programs, such as the "Strategic Actions For Emergencies" (S.A.F.E) emergency preparedness program and the Community Emergency Response Team (CERT) program. Where feasible, assist in neighborhood drills and safety exercises to increase participation and build community support.	16	8	0	0	2	2	2	1	0	0	0	0	1	0	0	0
STRATEGY 5. Reduced Urban Heat Island Effect and Resilient Water Resources																			
5.1	Reduce urban heat island effect through cool roofs, parking lot shading, landscaping, and urban greening in new and existing private and public development.	5.1.1	Amend the Zoning Code to create tree planting standards for new and renovated development, to require the planting of two trees in single-family development in the front, side, or rear yard as feasible, and to create lineal landscaping standards for commercial development that identify a minimum number of tree plantings based on lineal frontage length.	18	6	0	0	2	2	1	0	1	2	1	1	0	1	0	1
		5.1.2	Encourage the inclusion of additional shade trees, vegetated stormwater treatment and landscaping to reduce the "heat island effect" in development projects.	20	8	0	0	2	2	1	0	1	2	1	1	0	1	0	1
		5.1.3	Encourage the installation or use of cool roof technologies, green roofs, and rooftop gardens in new and existing private and public development.	13	6	0	0	2	0	1	0	0	2	0	1	0	1	0	0
		5.1.4	Support outreach and education describing benefits of cooling strategies, including promotion of the Cool California website and resources on the City website and at City Hall.	9	6	0	0	2	0	1	0	0	0	0	0	0	0	0	0
		5.1.5	Reduce heat gain from surface parking lots in new development for a minimum of 50% of the site's hardscape. Develop standards to provide shade from the existing tree canopy or from appropriately selected new trees that complement site characteristics and maximize drought tolerance. Where feasible, use open-grid pavement systems (at least 50% pervious, which would also satisfy the stormwater Low Impact Development requirement).	18	8	0	0	2	2	1	0	0	2	0	1	0	1	0	1
		5.1.6	Update City design standards to use heat-mitigating and heat resistant materials on pedestrian walkways and transit stops.	17	8	0	0	2	0	2	1	0	2	0	1	0	1	0	0
		5.1.7	Collaborate with the regional transit providers to install cooling technologies/structures/design features at transit stops.	12	6	0	0	2	0	0	1	0	2	0	1	0	0	0	0
5.2	Advocate for Drought-Proof Water Supplies including recycled water system or indirect potable recharge	5.2.1	Work with water utilities to evaluate vulnerabilities of water supply systems and develop strategies to improve resilience.	14	8	0	0	2	0	0	2	0	0	0	0	1	0	0	1
		5.2.2	Collaborate with federal, State, and local agencies and organizations to identify future water supplies, explore alternative supply sources, and improve capacity.	14	8	0	0	2	0	0	2	0	0	0	0	1	0	0	1
		5.2.3	When updating master plans for infrastructure, including water supply, flood control and drainage, and critical facilities, review relevant climate change scenarios and ensure that the plans consider the potential effects of climate change and include measures that provide for resilience to climate impacts.	16	8	0	0	2	2	2	1	0	0	0	0	1	0	0	0
		5.2.4	Develop, implement and manage a new city-wide water rationing and conservation plan, including community outreach and education. This project will begin the conversion of City and private-owned irrigation facilities from potable to recycled water where they are adjacent to recycled water pipelines.	16	8	0	0	2	2	2	1	0	0	0	0	1	0	0	0
		5.2.5	Continue to require all commercial and industrial development south of the Hetch Hetchy right-of-way to install recycled water lines, and require conversion of landscape irrigation to recycled water as soon as available.	16	8	0	0	2	2	1	1	0	0	0	0	1	1	0	0
		5.2.6	Aggressively pursue expansions to the treatment and distribution capacity of recycled water supplies and coordinate with the City of San Jose South Bay Water Recycling Program to increase recycled water supplies available to Milpitas.	16	8	0	0	2	2	0	2	0	0	0	0	1	1	0	0
STRATEGY 6. Integrated Resilience Planning and Improved Biodiversity and Habitat																			
6.1	Embed climate resiliency and adaptation across planning efforts.	6.1.1	Integrate climate resiliency throughout long-term planning and current development projects.	21	8	2	0	2	2	2	1	0	2	0	1	1	0	0	0
		6.1.2	Participate in regional climate adaptation planning efforts.	20	8	2	0	2	2	2	0	0	2	0	1	1	0	0	0
		6.1.3	Encourage and support private sector investment in climate adaptation through climate-resilient infrastructure such as onsite renewable energy, integrated stormwater management and water conservation.	15	6	0	0	2	2	1	1	0	0	0	0	1	1	1	0
6.2	Integrate findings of climate vulnerability into all phases of emergency planning.	6.2.1	Ensure that emergency response plans and training programs continue to evolve and are modified to incorporate future climate projections in order to protect residents, infrastructure, and facilities during emergencies and extreme weather events.	20	8	2	0	2	2	2	0	0	2	0	1	1	0	0	0
6.3	Prioritize nature-based solutions to improve resilience while promoting biodiversity.	6.3.1	Continue the City's Tree Maintenance Program.	20	8	0	0	2	2	1	0	1	2	1	1	0	1	0	1
		6.3.2	Promote tree health, removal of dead branches and trees that may become a hazard in severe weather, earthquake or a result of drought.	17	6	0	0	2	2	0	0	1	2	1	1	0	1	0	1
		6.3.3	Prepare and adopt an Urban Forest Management Plan (UFMP) for Milpitas.	18	8	0	0	2	2	1	0	0	2	0	1	0	1	0	1
		6.3.4	Conserve existing native trees and vegetation where possible and integrate regionally native trees and plant species into development and infrastructure projects where appropriate.	20	8	0	0	2	2	1	0	1	2	1	1	0	1	0	1
		6.3.5	Work with the Santa Clara Valley Water District to restrict future fencing, piping and channelization of creeks when flood control and public safety can be achieved through measures that preserve the natural environmental and habitat of riparian corridors; in addition, evaluate opportunities to revert some existing concrete-lined channels to more natural alternatives such as levees.	18	8	0	0	2	2	0	0	0	2	0	1	1	1	0	1
		6.3.6	Collaborate with the Santa Clara Valley Water District to support the priorities and projects of the Safe, Clean Water and Natural Flood Protection Program. Pursue grant funding opportunities from the District to provide funding for water conservation, habitat restoration, and open space projects that increase community resiliency, while improving water quality and increasing flood safety throughout the community.	19	8	0	0	2	2	0	1	0	2	0	1	1	1	0	1
		6.3.7	Continue to collaborate with the Santa Clara Valley Water District, and pursue grant funding from the district to support the priorities and projects of the Safe, Clean Water and Natural Flood Protection Program.	19	8	0	0	2	2	0	1	0	2	0	1	1	1	0	1
		6.3.8	Encourage and accommodate multipurpose flood control projects that incorporate recreation, education, resource conservation, preservation of natural riparian habitat, and the scenic value of drainages, creeks, and detention ponds.	18	8	0	0	2	2	0	0	0	2	0	1	1	1	0	1

Prioritization Framework

All actions are prioritized based on timeline (when they should be implemented - near, mid, long term)

Criteria	Description and Score					
Climate Resilience Potential	Small - The action has a small effect on reducing risk of climate impacts. 4		Medium - The action has a medium effect on reducing risk of climate impacts. 6		High - The action has a high effect on reducing risk of climate impacts. 8	
City Cost Effectiveness	Costs Outweigh Benefits - Implementation costs slightly outweigh the long-term financial benefits. -2		Benefits Match Costs - Long-term financial benefits match implementation costs OR don't know the overall cost effectiveness of the action. 0	Benefits Outweigh Costs - Long-term financial benefits outweigh implementation costs. 2		
Residential and Business Cost Effectiveness	Cost Outweigh Benefits - Long-term financial benefits do not outweigh implementation costs. -2		Benefits Match Costs - Long-term financial benefits match implementation costs OR don't know the overall cost effectiveness of the action. 0		Benefits Outweigh Costs - Long-term financial benefits outweigh implementation costs. 2	
Technological/ Implementation Feasibility	No - Technology is not readily available and is not on track to be deployed in the specified timeframe. -2		Maybe - Technology is on track to be deployed in the specified timeframe OR don't know about the status of the technology. 0		Yes - Technology needed currently exists. 2	
Current Policies or Ordinances	No - Policies or ordinances currently exist that prohibit this action. -2		Maybe - Policies or ordinances would need to be developed to support this action OR don't know if policies or ordinances currently exist. 0		Yes - Policies or ordinances currently exist that support this action. 2	
Jurisdictional Control	No - City is the influencer. 0		Maybe - City is the regulator. 1		Yes - City is the actor. 2	
Implementation Timeframe	6+ Years - Action could be operational after 6+ years. 0		3-5 Years - Action can be operational in the next 3 to 5 years. 1		1-2 Years - Action can be operational in the next 1 to 2 years. 2	
Co-Benefits						
Benefits to Renters	No - This action does not benefit who rent their home to see the cost savings of energy efficiency upgrades, improvements in transit and fuel, and housing security. 0			Yes - This action benefits residents who rent their home to see the cost savings of energy efficiency upgrades, improvements in transit and fuel, and housing security. 1		
Equity	No - This action neither enhances nor decreases health and racial equity through improved quality of life, access to resources and opportunities, or health OR don't know what impact this action has on equity. 0			Yes - This action enhances health and racial equity through improved quality of life and access to resources and opportunities. 2		
Air Pollution Prevention	No - This action does not impact local or regional criteria pollutant emissions OR don't know what impact this action has on local or regional criteria pollutant emissions at location of implementation. 0			Yes - This action minimizes local or regional criteria pollutant emissions at the location of implementation. 1		
Health and Well-Being	No - This action does not influence public health OR don't know what impact this action has on public health. 0			Yes - This action enhances public health. 1		
Reliability	No - Action does not impact the reliability of the electrical grid, transportation system, emergency response, etc. OR don't know the impact on reliability. 0			Yes - Action helps increase reliability of the electrical grid, transportation system, emergency response, etc. 1		
GHG Mitigation	No - Action does not result in GHG reductions in the City OR don't know what impact action has on GHG reductions. 0			Yes - Action will reduce GHG emissions in the City. 1		
Job Development	No - Action does not influence job creation in Milpitas OR don't know what impact action will have on job creation in Milpitas. 0			Yes - Action maximizes quality job creation in Milpitas. 1		
Resource Preservation	No - Action does not impact greenspaces/prime habitat OR don't know what impact action will have on these resources/biodiversity. 0			Yes - Action helps preserve greenspaces/prime habitat/biodiversity. 1		
				Maximum Potential Score		27