City of Mountain View

COUNCIL REPORT

DATE: November 7, 2023

CATEGORY: Consent

DEPT.: City Manager's Office

TITLE: **2022 Local Government Operations Greenhouse Gas Emissions Inventory**

RECOMMENDATION

Accept the 2022 Local Government Operations Greenhouse Gas Emissions Inventory.

BACKGROUND

On March 9, 2010, the City adopted greenhouse gas (GHG) reduction targets for municipal operations toward a goal of reducing emissions 80% below 2005 levels by 2050. The adoption of the targets was in response to the Global Warming Solutions Act of 2006 (Assembly Bill 32), which requires California to reduce Statewide GHG emissions. Additional interim targets were added on May 19, 2015 as part of the Municipal Operations Climate Action Plan. Starting in 2009, the City Council approved a series of implementation plans to address sustainability and work toward these reduction targets, including Environmental Sustainability Action Plans 1, 2, and 3. The City Council adopted the most recent plan, Sustainability Action Plan 4 (SAP-4), on October 22, 2019. Updates on the SAP-4 implementation were provided to the City Council on May 11, 2021 and to the Council Sustainability Committee (CSC) on December 1, 2021 and May 30, 2023. The last update recommended modifications to remaining actions, including the development of a Decarbonization Strategy for Mountain View.

Table 1 shows Mountain View's current GHG reduction targets for government operations, expressed as a percentage below 2005 levels. The City conducts a government operations inventory at least every five years to measure its progress against these targets.

Table 1: GHG Reduction Targets for Government Operations

Year	Reduction Target (below 2005 baseline levels)
2010	15%
2015	20%
2020	25%
2025	34%
2030	44%
2035	53%
2040	62%
2045	71%
2050	80%

On October 3, 2023, staff presented the 2022 Local Government Operations GHG Emissions Inventory to the CSC. The CSC provided feedback as noted later in this report and accepted the Inventory for transmittal to the full Council.

ANALYSIS

Inventory Methodology

Conducting a government operations emissions inventory involves measuring the energy used, fuel consumed, and waste generated from the agency's operations. Staff then calculates the amount of metric tons (MT) of carbon dioxide equivalent (MT CO_2e) resulting from those activities.

All the City's government operations GHG inventories have used a national standard developed by the California Air Resources Board, the California Climate Registry, and ICLEI—Local Governments of Sustainability (formerly International Council for Local Environmental Initiatives). This protocol for Local Government Operations (Protocol) establishes reporting requirements and accounting guidance for quantifying GHG emissions from local government operations.

Although the Protocol provides a common national framework for assessing local government emissions, any GHG inventory represents an estimate that is subject to change as better data and calculation methodologies become available. For example, global warming potentials are a set of metrics that have changed over time. Global warming potentials are used to convert methane and nitrous oxide emissions to an equivalent amount of MT CO_2e. When conducting the 2022 government operations inventory, staff also updated the emissions in the 2018 inventory based on the global warming potential data from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report, which reflects the best available science. Previously, inventories

have used the IPCC Second Assessment, which specified a lower global warming potential for methane and a higher warming potential for nitrous oxide. Updates based on the new global warming potentials increased 2018 emissions by about 16%. These increases primarily impacted the calculations for the emissions from the closed Shoreline Landfill and government-generated solid waste. The emissions from the early inventories (2005 and 2010) continue to be based on the IPCC Second Assessment since they were calculated by consultants and are more difficult to update.

2022 Local Government Operations Greenhouse Gas Emissions Inventory Results

In 2022, government operations generated 9,623 MT CO_2e, 5% less than 2018 emissions and 46% less than 2005 baseline emissions, doing better than the City's 2025 and 2030 reduction targets. Table 2 provides the 2022 GHG emissions and compares them to the 2005 baseline and the 2025 and 2030 reduction targets.

Table 2: Results of the 2022 Local Government Operations Inventory

Total Emissions (MT CO_2e)	% Below 2005 Baseline	% Below 2025 Target	% Below 2030 Target
9,623	45.7%	17.8%	3.1%

Figure 1 provides the results of the City's local government operations inventories since 2005 compared to the GHG reduction targets through 2030.

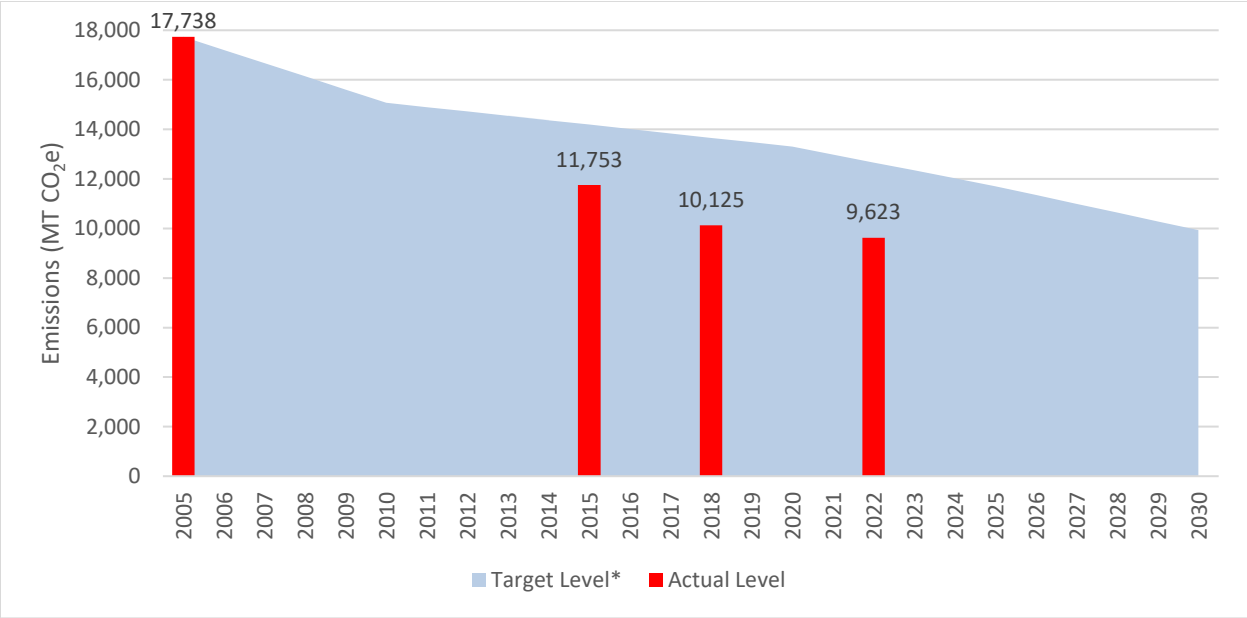

Figure 1: Local Government Operations—GHG Emissions and Reduction Targets, 2005 Through 2030

* *Target levels for interim years were interpolated based on adopted reduction targets.*

As shown in Figure 2, the Shoreline Landfill remained the largest source of emissions (49%), followed by buildings and facilities (19%), the City's vehicle fleet and off-road equipment (17%), employee commutes (11%), and government-generated solid waste (3%).

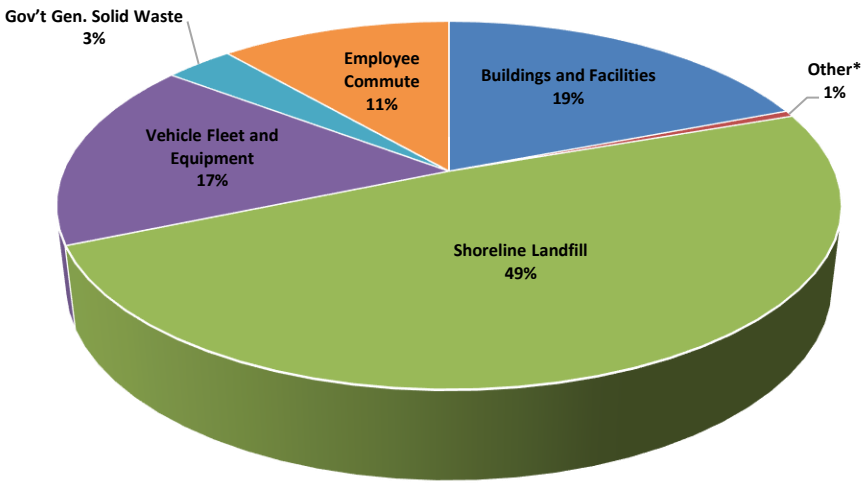

Figure 2: 2022 Government Operations GHG Emissions Inventory by Sector (9,623 MT CO_2e)

* *Includes emissions from water transport, wastewater treatment, and public lighting.*

Table 3 shows emissions and changes over time for the baseline year (2005), the previous inventory (2018), and the current inventory (2022).

Table 3: Total and Percent Change in Emissions, 2005, 2018, 2022

Sector	Emissions (MT CO_2e)			Change 2005 to 2022		Change 2018 to 2022	
	2005	2018*	2022*	MT CO_2e	%	MT CO_2e	%
Buildings and Facilities	2,736	1,395	1,842	-894	-33%	447	32%
Public Lighting	640	0	12	-628	-98%	12	N/A
Water Transport	377	1.6	32	-345	-91%	31	1,931%
Wastewater Treatment	134	1.1	7	-127	-95%	6	529%
Shoreline Landfill	9,531	5,308	4,713	-4,818	-51%	-595	-11%
Vehicle Fleet and Equipment	1,722	1,755	1,59	-123	-7%	-156	-9%
Gov't Gen. Solid Waste	495	393	325	-170	-34%	-68	-17%
Employee Commutes	2,148	1,267	1,094	-1,054	-49%	-173	-14%
TOTAL	**17,738**	**10,125**	**9,623**	**-8,115**	**-46%**	**-502**	**-5%**

* *Updated based on the global warming potentials from the IPCC Fifth Assessment. The 2005 inventory was calculated with the global warming potentials from the IPCC Second Assessment.*

Figure 3 illustrates the changes in emissions by sector for each year in which a government operations inventory has been conducted.

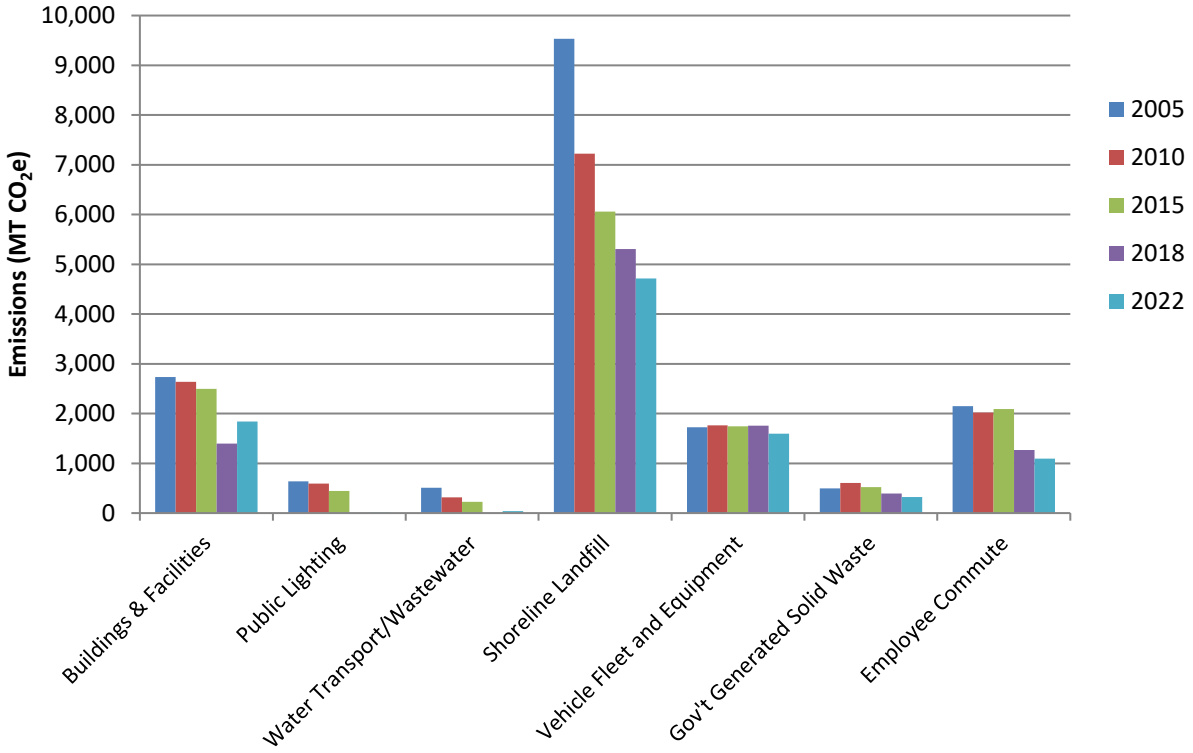

Figure 3: Greenhouse Gas Emissions by Sector—2005, 2010, 2015, 2018, and 2022

Between 2018 and 2022, total emissions decreased by 5%, or 502 MT CO_2e. The Shoreline Landfill, government-generated solid waste, and employee commuting sectors were responsible for the largest emissions reductions. Emissions dropped more significantly between 2015 and 2018 because emissions from electricity use were eliminated in 2017, when the City began purchasing 100% renewable electricity from Silicon Valley Clean Energy (SVCE) via their GreenPrime product. Emissions from electricity use are captured in five of the seven sectors: buildings and facilities, public lighting, water and transport, wastewater, and the Shoreline Landfill. In 2022, the emissions factor associated with SVCE's GreenPrime product increased slightly. GreenPrime is Green-e® Energy certified and meets the environmental and consumer protection standards set forth by the nonprofit Center for Resource Solutions.

Summary of Emissions Changes by Category

- **Shoreline Landfill (49% of total 2022 emissions):** Landfill emissions decreased by 11% between 2018 and 2022. The emissions attributed to this sector are from the operation of the Shoreline Landfill, which has been closed since the early 1990s. As organic

matter in the landfill decays, it produces methane, a potent greenhouse gas. Methane and other landfill gases are expected to be generated through about 2042 at gradually decreasing levels.

The Shoreline Landfill has a highly efficient landfill gas-collection system, which captures 93.7% of the methane produced. Microturbines collect some of this gas to generate on-site power for the City's sewage pump station, flare station, and irrigation pump station. The remainder of the collected methane is combusted through flaring, significantly reducing the resulting emissions.

- **Vehicle Fleet and Equipment (17% of total 2022 emissions):** Emissions from the municipal vehicle fleet decreased by 9% between 2018 and 2022. This sector includes emissions from gasoline and diesel use in fleet vehicles, as well as off-road equipment, such as landscaping equipment. Diesel and gasoline consumption decreased by about 10% between 2018 and 2022. The City's vehicle fleet added nine new hybrid and two new battery-electric vehicles between 2018 and 2022, bringing the fleet total to 56 hybrid and eight fully electric vehicles out of 312 total vehicles in active use. The Fleet Electrification Strategic Plan (Plan) has been drafted by the Plan consultant. Staff is reviewing the Plan, including potential implementation pathways for full fleet electrification.

- **Buildings and Facilities (19% of total 2022 emissions):** Emissions from buildings and facilities increased by 32% between 2018 and 2022. This category includes emissions associated with building electricity and natural gas use, fuel used in stationary generators, and refrigerant-containing equipment.

  Much of the emissions increase in this category can be attributed to higher natural gas use at a few City facilities that operated HVAC systems 24/7 as a part of the City's COVID-19 response. Running the HVAC system 24/7 supports better dilution of any pathogens in the air. Natural gas use at City facilities increased 21% from 2018 to 2022. Both the Senior Center and Municipal Operations Center (MOC) saw an increase in natural gas use (79% and 53%, respectively), which can be attributed to HVAC equipment running 24/7. The Eagle Park building and pool remained open during COVID-19, but it is in unclear how natural gas use has changed since 2018 as the natural gas meter was malfunctioning in 2017 and 2018 and did not record usage during that inventory year. Furthermore, the Community Center was closed from the summer of 2017 through early 2019 for rebuilding and expansion. Its reopening in 2019 also contributed to increases in both natural gas and electricity use. Natural gas use at the Civic Center has remained the largest source of emissions from this category. Fortunately, natural gas use at the Civic Center decreased by about 22% from 2018 to 2022 due to new, more efficient hot water boilers for both domestic and building heat. Staff is also in the process of retrofitting all existing light fixtures in City facilities to LEDs, with over a third of the lighting already upgraded. Once the retrofit project is complete, electricity use from lighting within City buildings will be decreased by over 60%.

Table 4 summarizes the changes in energy use at City facilities.

Table 4: Electricity and Natural Gas Consumption at City Facilities—2018 and 2022

Facility	Electricity (kWh)			Natural Gas (Therms)		
	2018	2022	% Change	2018	2022	% Change
Civic Center (City Hall and Center for the Performing Arts)	2,222,779	1,530,131	-31.2%	107,576	84,388	-21.6%
Library	1,079,032	1,161,482	7.6%	26,382	23,635	-10.4%
Police/Fire Administration Building	1,213,505	2,461,090	102.8%	28,458	28,314	-0.5%
Municipal Operations Center	703,476	637,757	-9.3%	23,604	36,032	52.7%
Community Center	70,004	324,962	364.2%	2,206	4,987	126.1%
Minor Facilities*	482,496	580,410	20.3%	0	397	
Mountain View Sports Pavilion	393,278	345,579	-12.1%	5,262	4,602	-12.5%
Senior Center	465,758	529,474	13.7%	13,782	24,668	79.0%
Fire Stations	337,471	389,268	15.3%	18,118	16,601	-8.4%
Other Community Services Facilities**	508,842	38,682	-92.4%	12,276	27,206	121.6%
Eagle Park Building and Pool	228,030	327,690	43.7%	N/A	37,768	N/A
Whisman Sports Center	108,950	99,676	-8.5%	2,035	286	-85.9%
TOTAL	**7,813,621**	**8,426,201**	**7.8%**	**239,699**	**288,884**	**20.5%**

* Includes parking garages and park lighting.

** Includes The Teen center, Historic Adobe Building, Shoreline Gatehouse, Michaels at Shoreline Restaurant, and Golf Pro Shop.

Addressing this source of emissions will be necessary to meet the City's adopted emission-reduction goals. Natural gas use now comprises about 16% of total emissions from City operations. To address these emissions, City staff is prioritizing the electrification of City facilities. The new, all-electric Rengstorff pool will open in 2024. The City was awarded $497,000 to convert the Senior Center's water heater and kitchen to electric systems. The project is under permit review and construction and is expected to be completed in 2024. In addition, City staff submitted a grant application to the California Strategic Growth Council in September 2023, part of which requested funds to electrify the Senior Center's heating, cooling, and ventilation system. Staff is also developing a Request for Proposals

seeking a consultant to develop a decarbonization strategy and implementation plans, which will include electrification opportunities for City facilities.

- **Employee Commute (11% of total 2022 emissions):** Emissions from employee commutes were about 14% lower in 2022 than in 2018. Increased rates from telecommuting were the most significant contributor to this decline. Based on responses to the "Employee Commute Survey" conducted in spring 2023, the number of employee commute trips by all nontelecommute modes (drive-alone, carpool, transit, bike, and walk) decreased, and the rates of telecommuting increased. About 27% of survey respondents that drive or carpool to work use an electric, hybrid, or hydrogen fuel cell vehicle.

  In April 2017, the City created a Pilot Telecommuting Program to authorize eligible City employees to work remotely up to one workday per week with manager approval. On March 16, 2020, the County of Santa Clara issued an initial public health shelter-in-place (SIP) order in response to the spread of COVID-19. This order required nonessential businesses to cease most in-person operations, except for those performed by essential workers whose job duties required them to be on-site. Several positions at the City were able to temporarily work from home to remain in compliance with the County orders. On June 30, 2020, the City Council adopted a resolution to support expanded telecommuting and other measures to reduce single-occupancy vehicle trips. Shortly thereafter, and in preparation for returning to the workplace in 2021, the City revised the Telecommuting Program to provide opportunities for employees to request to telecommute occasionally, or up to two days per workweek, for employees who are assigned to a position with responsibilities that can be accomplished off-site, and the request is within the parameters of the policy. In addition, the policy allows for intermittent telecommuting for employees whose regular work is on-site but may have intermittent ability to work remotely as well as the potential for up to three days of telecommuting per week, subject to approval.

Table 5 summarizes the results of Employee Commute Surveys conducted for 2018 and 2022.

Table 5: Percentage of Employee Commute Trips by Mode

Mode	2018	2022
Drive Alone	70.5%	66.9%
Carpool	6.0%	4.2%
Transit	14.3%	7.2%
Bike	4.5%	3.2%
Walk	4.8%	4.1%
Telecommuting	Not Accounted For*	14.4%
TOTAL	**100%**	**100%**

* *The Employee Commute Survey for 2018 did not assess telecommuting rates, but it is assumed that rates were low*.

The City has developed a number of other programs to reduce single-occupancy vehicle trips by both City employees and the community-at-large. City employees can access commuter benefits, including transit and bicycle stipends. Furthermore, the City has a robust Transportation Demand Management (TDM) program for new developments, as well as other land use policies, infrastructure, and programs, to reduce vehicle use and support alternative modes of transportation. Staff can also access electric-vehicle-charging infrastructure at multiple City facilities, including the Civic Center, the MOC, and the Community Center. Commute emissions from electric vehicles, even if those commutes are drive-alone, are counted as zero emissions for the purposes of this inventory.

- **Government-Generated Solid Waste (3% of total 2022 emissions):** Emissions from government-generated solid waste decreased by 17% between 2018 and 2022 due to a decrease in the amount of material sent to the landfill. The City can address the ongoing emissions from solid waste by diverting more organic material from the landfill and reducing waste generation overall. California's mandatory organics recycling law (Assembly Bill 1826) took effect in 2016, requiring large commercial entities, including City facilities, to divert their organic waste from landfills. Furthermore, Senate Bill 1383 mandated composting Statewide in 2022 with a goal of reducing greenhouse gases emitted from landfilling. Most City facilities have implemented composting services to separate organic material from the trash, except public-generated trash collected from the parks and downtown litter cans.

- **Water Transport and Wastewater Treatment (0.4% of total 2022 emissions):** Emissions from water transport and wastewater treatment remained low in 2022. This category includes energy and fuel used to power sewage infrastructure and transport water, including water delivery pumps, sprinklers and irrigation control, stormwater management, and other purchased-electricity use for water delivery. As discussed earlier, the emissions factor associated with SVCE's GreenPrime product increased slightly between 2018 and 2022, contributing to higher emissions in this sector.

- **Public Lighting (0.1% of total 2022 emissions):** Emissions from public lighting include emissions associated with electricity used to power traffic lights, streetlights, park lighting, and other public lighting. Emissions remained negligible in 2022. The City's purchase of renewable electricity from SVCE was responsible for the reduction of these emissions, which comprised 3.6% of the City's baseline 2005 inventory. The emissions increase between 2018 and 2022 is primarily due to the higher emissions factor for SVCE's GreenPrime product.

Opportunities for Future Emissions Reductions

Staff has completed or made progress on many actions within SAP-4 to further reduce emissions from government operations. Table 6 contains the list of relevant SAP-4 actions and their status as of May 2023.

Table 6: Status of SAP-4 Actions Focused on Government Operations

Task #	Action	Status	Estimated Completion Date	Update
T7.3	Install additional EV chargers in downtown parking garages.	In Progress	Q3 2023	In spring 2022, 10 L2 chargers and make-ready infrastructure for 15 more L2 chargers were installed at the 135 Bryant Street parking garage, and six chargers were added to the Civic Center garage. A building permit was issued in March 2023 to install 22 L2 chargers and one L3 charger at the 850 California Street garage.
T7.4	Develop an Electric Vehicle Action Plan.	Completed	Q4 2021	Plan was published in December 2021.
T7.5	Evaluate opportunities to add EV chargers to other City facilities.	Completed	Q2 2022	Staff identified opportunities to install EV chargers at several City-owned parking facilities.
T7.6	Evaluate vendor options for existing EV chargers at City facilities.	Completed	Q2 2022	Defunct ChargePoint chargers at 850 California Street and Civic Center parking structures were replaced with PowerFlex charging ports in spring 2022.
T7.10	Install additional EV chargers as needed at City facilities.	Completed/ Ongoing	Ongoing	The Rengstorff Park Aquatics Center Replacement Project will include four EV chargers as well as make-ready infrastructure for future installation of additional chargers. PowerFlex will install these chargers at no direct cost to the City under agreement to cede carbon-offset credits to PowerFlex.
T8.3	Develop a Fleet Electrification Plan	In Progress	Q4 2023	The City has hired a consultant to assist with developing a fleet electrification plan. The Plan includes EV-replacement candidates for various vehicle classes and planning and cost

Task #	Action	Status	Estimated Completion Date	Update
				estimates for charging infrastructure at three primary sites.
T8.4	Explore fuel-efficiency measures to reduce City fleet fuel use	Completed/ Ongoing	Ongoing	Staff proposes fuel-efficient, hybrid, and electric vehicles during the equipment-replacement process and has transitioned the City's fleet to red-dye diesel, which is a cleaner-burning renewable fuel.
T8.5	Explore opportunities to pilot or test heavy-duty electric vehicles	Completed	Q3 2023	Public Works staff worked with Library staff to develop specifications for an EV to replace the City's Bookmobile. The Bookmobile is expected to be delivered in 2023. Other opportunities will be pursued through T8.3.
T9.2	Revise Employee Commute Survey to support GHG inventory.	Completed	Q2 2020	Completed in February 2020.
T9.3	Evaluate City employee demand for EV charging.	In Progress	Q2 2023	Employee demand for EV charging is being assessed through the City Employee Commute Survey, which was deployed in May 2023.

ENERGY

Task #	Action	Status	Estimated Completion Date[1]	Update
B4.1	Analyze opportunities for electrification during renovations.	Complete/ Ongoing	Ongoing	The conversion of the HVAC system at Fire Station No. 1 to all-electric was completed in June 2022. The all-electric Rengstorff Aquatics Center project is under construction and scheduled for completion in fall 2023. Electrification of the Senior Center's domestic water heating system is under preliminary design. Other opportunities will be evaluated in S1.8.
B4.5	Develop LEED® Gold certification policy with LEED® Platinum analysis.	Completed	Q2 2020	Policy approved by Council on June 9, 2020.
B4.6	Develop electrification and renewable energy policy for City facilities.	Completed	Q2 2020	Policy approved by Council on June 9, 2020.
B4.8	Implement energy efficiency upgrades in City facilities.	Complete/ Ongoing	Ongoing	A Limited-Term Facilities Technician was hired in October 2021. Scope of work included LED-light retrofits and other energy conservation tasks.

OFF-ROAD EQUIPMENT, TREE CANOPY, AND WATER

Task #	Action	Status	Est. Completion Date[1]	Update
P3.1	Expand use of electric landscaping equipment and test new models.	In Progress	Q3 2024	Staff continues to replace older gas-powered equipment. Staff has held demo days for Fleet and Parks staff to try out new technology. Two upcoming parks (Evelyn and Villa Parks) will be fully maintained with electric equipment.
W1.2	Investigate installing a CIMIS weather station.	Completed	Q4 2021	Investigation identified potential problems with burrowing owls and the height of the station. Staff decided to not move forward with the installation.

OFF-ROAD EQUIPMENT, TREE CANOPY, AND WATER

Task #	Action	Status	Est. Completion Date[1]	Update
W1.3	Conduct a communitywide irrigation audit.	Completed	Q4 2023	The audit is complete, and staff is implementing the recommendations.

CORE SUSTAINABILITY AND OUTREACH

Task #	Action	Status	Est. Completion Date[1]	Update
S1.3	Allocate funds for community/municipal pilot projects and training.	In Progress	Q2 2023	Council approved appropriating funds for Project 22-34, which will electrify the water heaters and kitchen appliances at the Mountain View Senior Center.
S1.8	Develop Decarbonization Strategy and Municipal and Community Implementation Plans.	In Progress	Q2 2024	Staff worked with Stanford students to develop a high-level decarbonization strategy and will solicit consulting services in fall 2023 to develop a decarbonization strategy and implementation plans for the community and City facilities.
S2.3	Complete Final 2017 Local Government Operations GHG Inventory.	Completed	Q2 2020	Due to having updated data, presented 2018 inventory (rather than 2017) to City Council on April 21, 2020.
S2.12	Complete 2022 Local Government Operations GHG Inventory.	In Progress	Q4 2023	The final inventory has gone to the CSC in October 2023 and to Council in Q4 2023.

COUNCIL SUSTAINABILITY COMMITTEE FEEDBACK

As noted above, on October 3, 2023, staff presented the 2022 Local Government Operations GHG Emissions Inventory to the CSC. During this meeting, the CSC expressed appreciation for the progress made toward reducing emissions from government operations. The CSC asked clarifying questions about emissions from the operation of the Shoreline Landfill, energy use at the Police/Fire Administration Building, water transport, and wastewater treatment. The CSC also requested that future reports more comprehensively assess the benefits of the City's decarbonization projects, including financial savings where possible, and capture how many employees are commuting by electric vehicle.

FISCAL IMPACT

There is no fiscal impact associated with accepting the 2022 Local Government Operations GHG Emissions Inventory.

CONCLUSION

The 2022 Local Government Operations GHG Emissions Inventory shows emissions decreasing slightly below 2018 levels. While the City has been successful in exceeding its near-term reduction targets, the decrease in emissions can be partially attributed to procuring 100% renewable electricity through SVCE and the natural decrease in emissions from the closed Shoreline Landfill. Additionally, COVID-19 had an impact on emissions, particularly emissions from City facilities and employee telecommuting. Continued efforts will be needed to ensure the City remains on-track toward its long-term GHG reduction targets and contributes to the City's goal of achieving communitywide carbon neutrality by 2045 or sooner.

ALTERNATIVES

1. Accept the 2022 Local Government Operations Greenhouse Gas Emissions Inventory.

2. Do not accept the 2022 Local Government Operations Greenhouse Gas Emissions Inventory.

3. Provide other direction.

PUBLIC NOTICING

Agenda posting and emails sent to community members interested in sustainability.

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