Blueprint for Climate Action

Adopted November 2024

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City of Petaluma

Blueprint for Climate Action

CLIMATE READY
2030

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DISCLAIMER

This Blueprint for Climate Action articulates broad policies to achieve equitable climate action. The Blueprint does not approve, fund, or authorize the implementation of any specific projects. Each implementation program will be reviewed and approved over time and follow protocols for approval/adoption, which may require additional public review, review by the City Council and Climate Action Commission and/or other advisory bodies, and/or environmental review under the California Environmental Quality Act.

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Chapter 1: Executive Summary

The world is at a critical crossroads. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe, including California and Petaluma. Evidence of observed changes include heatwaves, heavy precipitation, more frequent coastal flooding, droughts, and hurricanes. Both gradual climate change (e.g., sea level rise) and climate hazard events (e.g., extreme temperature days) expose people, infrastructure, developed areas, and ecosystems to a wide range of stress-inducing and hazardous situations. These hazards and their impacts disproportionately affect the most sensitive populations.

To address these changes, the City of Petaluma is proud to present this Blueprint for Climate Action. This Blueprint lays out a bold path for carbon neutrality by reducing emissions from all activity in the city, including direct and indirect emissions, by reducing, sequestering, and, if necessary, offsetting emissions with local projects (see Figure 1[1]). While reduction of direct emissions on a jurisdiction level is important, personal choices at a household level are also a key component in achieving carbon neutrality. With many jurisdictions, states and nations working to be carbon neutral by 2045, the City of Petaluma set a bold goal to be carbon neutral by 2030. Our success in reducing our emissions depends on the actions of the community, City action, City staffing and financial capacity. Additionally, the City will need to work
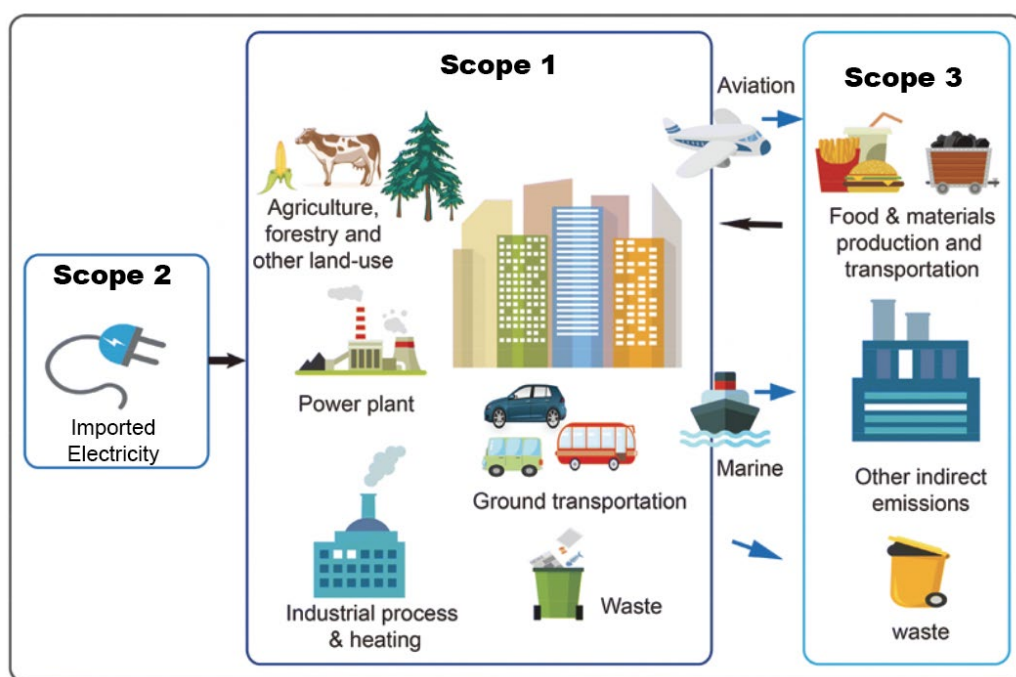
Figure 1: Sources of Direct and Indirect Emissions. The path to carbon neutrality must travel through the impacts of business decisions and household choices, and consumers must become educated on those impacts.

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[1] Adapted from Chen, J., Zhao, F., Zeng, N. *et al.* Comparing a global high-resolution downscaled fossil fuel CO_2 emission dataset to local inventory-based estimates over 14 global cities. *Carbon Balance Manage* **15**, 9 (2020). https://doi.org/10.1186/s13021-020-00146-3

collaboratively with regional, statewide, national, and global systems that the City relies on and is a part of to reach carbon neutrality by 2030.

Petalumans have already begun to address this challenge through progressive actions that have established Petaluma as both a Regional and National climate leader. This document provides the pathway to achieving carbon neutrality. Actions that the City of Petaluma have already taken towards achievement of this goal include:

- The City is conducting energy efficiency analyses and upgrades for City owned facilities which includes analysis of the existing electric service capacity.
- The City is taking advantage of energy efficiency and renewable energy opportunities such as solar, floating solar, renewable diesel, LED streetlight conversions, gas-to-heat pump water heater replacements in City facilities, participating in Sonoma Clean Power's EverGreen 100% Renewable Energy Program, and transitioning the City's vehicle fleet to electric where possible.
- The City has either adopted or is in the process of adopting ambitious climate policies and plans, such as: the Climate Emergency Framework; Electric Vehicle (EV) Preferred Purchasing Policy; Integrated Pest Management Plan; Tree Preservation Ordinance; EV Charging Infrastructure Master Plan; City-wide Electrification Initiatives; All-Electric Requirements for New Construction and Substantial Remodels; Prohibition of new Fossil Fuel Gas Stations; Sustainable Purchasing Policy; including active transportation upgrades routinely in street infrastructure projects, and encouraging public transportation through Petaluma Transit's fare-free and micro-transit programs.
- The City is partnering with community organizations, such as Cool Petaluma, Daily Acts, and ReLeaf Petaluma, to implement and strengthen climate action initiatives throughout the City.

The Blueprint will serve as Petaluma's Climate Action Plan. It is our roadmap to a sustainable future, where our community thrives in balance with the environment. The City's goal of achieving carbon neutrality by 2030 will require a "What does it take?" scenario (the light blue line in Figure 2[2]). Central to this vision is a commitment to stop business as usual, shifting away from the unsustainable patterns that perpetuate harm and inequality. The City's climate goal will require an almost complete transformation of the local economy and community, while strengthening the quality of life that makes Petaluma so exceptional. Delaying action comes at a price—financial, environmental, and social.
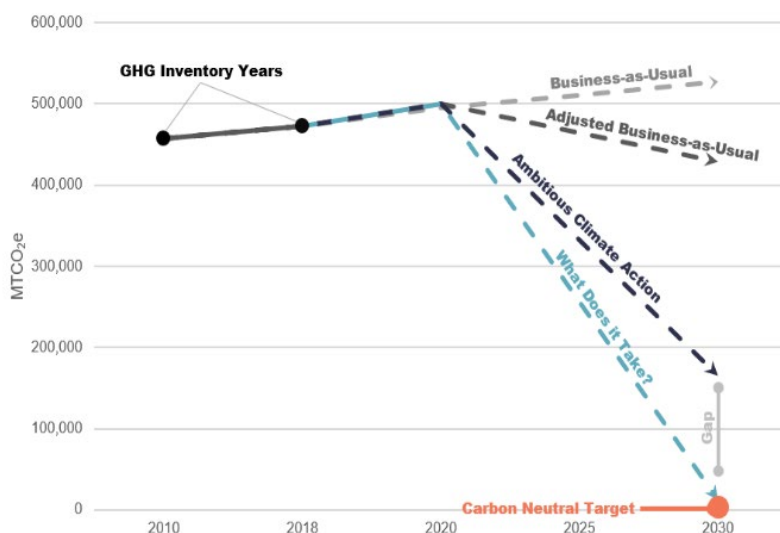
Figure 2. Climate Action Scenarios

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[2] *A more detailed explanation of the range of climate action scenarios facing Petaluma, from least to most aggressive action, can be found on page 42.*

Without immediate steps, our city faces:

- Increased costs from infrastructure damage caused by rising seas and extreme weather.

- Greater health risks from heat-related illnesses and poor air quality.

- Exacerbated inequities for vulnerable populations who are most affected by climate hazards.

The value of acting now is that Petaluma can secure economic benefits by investing in energy efficiency and renewable energy that yields long-term cost savings and builds our local workforce. We enhance our quality of life with cleaner air, safer streets, and a resilient ecosystem that benefits all residents and nature. It will mean questioning long-standing assumptions, resisting consumption-driven habits, and prioritizing what truly matters: connection, collaboration, and well-being.

Source: Picture created by ChatGPT, GPT-4, OpenAI

Through this framework, we will embrace a spectrum of strategies—from small, grassroots initiatives to transformative, system-wide actions—to meet our shared climate goals. The Blueprint is not a fixed document—it is an adaptive, collaborative framework. It outlines mechanisms for annual review, progress monitoring, and stakeholder engagement to ensure flexibility as technologies, policies, and funding opportunities evolve. It is designed with 33 cornerstone actions across the sectors of buildings, energy, transportation, resource consumption, and ecosystems. These priorities lay the foundation for future success and action. The Blueprint will focus on Greenhouse Gas reduction and is part of the City's comprehensive approach to climate planning, which also includes climate action and adaptation policies and actions that will be part of the General Plan, which is currently being updated.

By acting now, Petaluma can turn the challenge of climate change into an opportunity for innovation and community resilience. This Blueprint is a call to action for every Petaluman to contribute to a sustainable, equitable future. Together, we can transform our city and show the world that a carbon-neutral future is not just possible—it is inevitable.

Petaluma's Climate Vision

In 2019 the City of Petaluma declared a Climate Emergency and established a Climate Action Commission (CAC) to inform City action towards climate neutrality. Over the course of 2020, the Climate Action Commission and City staff developed the Climate Emergency Framework. The Climate Emergency Framework (CEF) was adopted by Petaluma City Council on January 11, 2021. The Framework commits the City to working towards communitywide climate neutrality by 2030 and articulates a vision for Petaluma's future and defines key values to guide the City's climate planning efforts. By acting decisively, Petaluma hopes to join and inspire others across the Bay Area in doing the same. As stated in the CEF, "Working as a community, the City can initiate a massive local economic impulse, model 21st century green architecture, landscape design, and engineering, and work to restore ecological balance and economic stability in the region."

Climate inaction has a compounding effect. The longer emission sources continue unabated, the greater the amount of reduction within a shorter time frame is required to offset the increases. Swift action that is rooted in integrity is necessary to ensure that City actions and policies contribute to improved climate justice, mitigation, sequestration, adaptation, public health, and social resilience outcomes and meet our mandates and targets. The CEF provides the direction on what the Blueprint should achieve in relation to climate change mitigation:

> *Our vision is to make Petaluma a leader in climate mitigation and sequestration to ensure a stable climate for ourselves and future generations. The City will endeavor to reach climate neutrality no later than 2030.*

A community thrives when all members benefit from actions and policies that increase awareness, education, collaboration, and engagement. To achieve the City's ambitious goal, the City must focus on an equitable implementation approach so every Petaluman can experience a healthy, sustainable future. The City must prioritize climate change-related programs, policies, and actions to achieve equitable outcomes for frontline and underserved communities. Petaluma is committed to prioritizing the health of the community and our ecosystems by taking equitable yet aggressive climate action to better prepare the City for future climate impacts.

The vision for Petaluma's future includes continuing to garner public support, community ownership, and desire to act on climate change from every economic, geographic, political, and demographic sector in Petaluma, especially from those who have been unable to participate in City governance or who will suffer first and worst from climate-driven problems.

Cornerstone Actions

The Blueprint establishes the path for the City to move towards carbon neutrality by 2030. It is a short range (5-10 year) implementation-focused plan that outlines the strategies and actions (i.e., policies, and programs) that the City and community need to implement to reduce greenhouse gas (GHG) emissions in line with the City's goal of carbon neutrality by 2030, and to create resilience to the impacts of climate change. It builds on the City's extensive body of existing and in-progress climate work, including the Climate Emergency Framework, the Active Transportation Plan, participation in Sonoma Clean Power, prohibition on new fossil fuel gas stations, City programs to move to electric fleet vehicles and use of solar power, the General Plan Update, and more.

The City has identified 33 cornerstone actions to jumpstart emission reductions within the city. These strategies were chosen because they align with City Council priorities, generate significant emissions reductions and co-benefits, and are foundational actions that prepare the city for the implementation of additional actions in the future. Table 1 lists the City's cornerstone actions. They are detailed further in Chapter 5, the sector-specific action plans.

Striving for carbon neutrality by 2030 requires transformational change to the built environment, street network and urban form, as well as a reimaging of daily life for Petalumans. It takes an immediate, coordinated "All of the Above" approach to put Petaluma on the pathway to carbon neutrality, as suggested by the priority actions below spanning all climate action sectors. Although the period of transition will be challenging for Petaluma to reach neutrality by 2030 or thereafter, each step toward carbon neutrality will ultimately enhance the quality of life and sustainability in Petaluma.

The dates reported throughout this Blueprint refer to the year that programs should be implemented by. When a measure says "by 2026" it means that the action will be implemented as written by January 1, 2026. ***For the Cornerstone Actions by year and corresponding page numbers, see page 43.***

Table 1. Cornerstone Actions

Cornerstone Action	Proposed Timeframe	Blueprint Strategy Alignment
Statement of Intent: To work towards the City's ambitious communitywide and municipal operations carbon neutrality goal by 2030, the City will establish, monitor, and publicize metrics; align its budget, department resources and staffing; define organizational structure, communications, and collaborative work plans; and manage facilities and assets to achieve carbon neutrality.		

OSS-1: Climate Team budget and staffing strategy. Implement a budget and staffing strategy to drive climate action implementation and accountability across all City departments and on the Climate Team. **OSS-2: Blueprint Coordinators.** Establish departmental Blueprint Coordinators throughout the City to collect data, lead educational activities, coordinate updated annual workplans, participate in established City Leadership activities, and incentivize actions consistent with the Blueprint vision.	By 2026 Reevaluate regularly with the budget process By 2027	Organization Structure and Staffing Strategy (OSS)
CST-1: Education and training program for City staff. Develop and implement an ongoing education program for new and continuing employees about the City's GHG reduction and climate adaptation programs, and explicitly integrate climate positive action into the City's mission.	By 2026	City Staff Training Strategy (CST)
MR-1: Greenhouse gas emissions and Blueprint monitoring. Monitor the progress of the Blueprint implementation and take corrective actions to ensure programs are advancing and the City is on track to achieve the carbon neutrality targets for communitywide and municipal operations emissions. **MR-2: Cost/benefit and funding sources.** Post adoption, estimate the order of magnitude cost of Blueprint implementation. Establish the protocol to determine the cost/benefit estimation process for Blueprint implementation. Identify gaps in funding sources to complement the City's annual budget process and engage stakeholders in identifying and pursuing funding opportunities.	By 2026	Monitoring and Reporting Strategy (MR)
FEEE-1: Aligning decarbonization goal and capital improvement plan. Align the City's Capital Improvement Plan with the facility decarbonization goal of 15% annual average replacement of gas-fueled equipment (100% by 2030).	By 2026	Facility Energy Efficiency and Electrification Strategy (FEEE)
FEEE-2: City asset and facilities management. Accelerate the City's own actions to achieve carbon neutrality through asset and facilities management, including facility audits and electrification	By 2030	Facility Energy Efficiency and Electrification Strategy (FEEE)
ZEVFB-1: Electrification of transit fleet. Accelerate the City's own actions to achieve carbon neutrality through electrification of the transit fleet.	By 2030	ZEV Fleet and Bus Strategy (ZEVFB)

Statement of Intent: To ensure transparency and accountability in the implementation of the Blueprint, and to ensure implementation is inclusive, focused on disadvantaged communities, for widespread community participation.		
In partnership with the County, stakeholder groups, utilities, and other partners, proactively distribute resources so that Petaluma residents, businesses, and contractors can access climate information and solutions. This may include events, e.g. Cool Petaluma resource fair, pop-up shopfronts, the library, and/or through a dedicated space on the City's website.	Ongoing	Across multiple strategies
GS-1: Climate awareness and action program. Implement a robust, ongoing climate awareness and action program, focused on reduction of direct and indirect emissions, including consumption-based emissions, by residents, businesses, and contractors through educational events, media outreach, and other creative approaches	By 2026	Goods and Services Strategy
Statement of Intent: Reducing emissions to achieve the City's target will require significant investments in active transportation infrastructure, transit service, transportation demand and parking management programs that reduce single-occupancy vehicle travel, and investment in electric vehicle infrastructure.		
TLUC-1: General Plan Update. Adopt the updated General Plan that defines transit-oriented communities, complete 15-minute neighborhoods, and incremental infill within the City's existing residential neighborhoods. **TLUC-2: Zoning Code revision.** Adopt a revised Zoning Code based on the updated General Plan.	By 2027	Transportation and Land Use Coordination Strategy (TLUC)
AT-1: Active transportation and complete street improvements. Establish complete streets policy and incorporate complete streets improvements into all roadway and development projects to reduce vehicle miles traveled through implementation of the following plans and initiatives. Focus plan implementation in disadvantaged communities and those with poor access to active transportation corridors.	By 2026	Active Transportation and Complete Streets Strategy (AT)
TS-1: Petaluma transit service. Expand and improve Petaluma Transit and shared mobility services to be more accessible, affordable, and timely.	By 2030	Transit Service Strategy (TS)

VEEM-1: Electric vehicle charging infrastructure strategy. Develop an EV charging infrastructure strategy focusing on workplaces, schools, and multi-unit dwellings aligned with utility and State provided incentives and focused initially on disadvantaged populations and neighborhood hubs.	By 2027	Vehicle Electrification and Electric Mobility Strategy (VEEM)
TDM-1: Transportation Demand Management Policy. Revise the TDM policy for employers that requires employers to submit an emission reduction plan to the City to meet the City's greenhouse gas reduction target.	By 2026	Transportation Demand Management Strategy (TDM)
PM-1. Parking management policy. Establish a parking management policy to balance supply and demand, to reduce demand for parking, and to meet target utilization rates at key destinations through the use of dynamic pricing.	By 2027	Parking Management Strategy
Statement of Intent: Petaluma accelerates a fossil-free utility system that reduces energy-related greenhouse gas emissions and decarbonizes new construction and existing buildings through low embodied carbon materials, energy efficiency, and electrification.		
CE-1: Barriers to renewable energy use. Partner with Sonoma Clean Power (SCP) and Pacific Gas & Electric (PG&E) to identify barriers for large users and/or sectors to participate at the 100% renewable tier and develop and conduct a robust awareness and education campaign to boost enrollment. Target 100% participation in EverGreen or similar 100% renewable energy tier.	By 2026	Clean Energy Strategy (CE)
NB-1: Track pending State standards. Utilize the City's existing cross-departmental task force to track pending State standards consistent with goal of carbon neutrality, including Marin's low-embodied carbon concrete code, CALGreen embodied carbon standards, NEC Article 750 and item 220.70, AB48, pending State law banning irrigation of non-functional lawns, and others.	Ongoing	New Buildings Strategy (NB)
EBEE-1: Electrification and Efficiency Strategy. Develop a phased-in Existing Building Efficiency and Electrification strategy to retrofit 85% of existing homes and businesses to all-electric by 2030.	By 2028	Existing Building Electrification and Efficiency Strategy (EBEE)
W-1: Resilient water supply. Create a resilient water supply by increasing conservation, utilizing and expanding existing incentive programs to include	By 2030	Water Strategy (W)

direct-install, implementing a tiered rate structure, and exploring greywater requirements as part of building code for all new construction and major renovations of existing buildings.		
Statement of Intent: To meet the goal of carbon neutrality by 2030, the City must manage its parks and other open spaces in ways that support healthy soils and foster plants that can thrive in Petaluma as the climate changes. Healthy landscapes are also important to protect biodiversity and ecological connection, improve water quality, and improve public health by improving access to quality green space.		
UF-1: Petaluma Urban Forestry Management Plan. Develop and adopt a Petaluma Urban Forest Management Plan in partnership with community organizations.	By 2026	Urban Forestry Strategy (UF)
OSM-1. Local and regional sequestration projects. Develop a policy that prioritizes local and regional carbon sequestration partnerships, projects, and sources in the city. **OSM-2: Carbon gardening campaign.** Create or support the creation of a carbon gardening campaign in school yards, community centers, resilience hubs, and neighborhoods that is widely engaging and highlights its multiple benefits: sequestration, consumption, food, biodiversity, water, health, cost savings, economic recovery and growth, resiliency, and climate justice and equity. **OSM-3. Integrated Pest Management Plan for HOAs.** Require new development to create an Integrated Pest Management Plan and provide templates for HOAs and the public. **OSM-4: Natural Open Space Management framework.** By 2027, develop and adopt a Natural Open Space Management framework as part of a comprehensive update to the Petaluma River Plan with policies to enhance wildlife corridors and increase carbon sequestration, biodiversity, and public access for different typologies of natural open space.	By 2027	Open Space Management Strategy (OSM)
SWD-1: Food waste and special event permitting. Update the special event permitting process to include zero waste requirements for events, such as requiring applicants to submit a "waste reduction plan" for each event.	By 2026	Solid Waste Diversion Strategy (SWD)

SWD-2: Food recovery program. Partner with Recology and Zero Waste Sonoma JPA to implement and enforce an edible food recovery program for commercial food uses, farmers market vendors, and events.		
SWD-3: Zero Waste Sonoma model disposable foodware ordinance. Adopt the Zero Waste Sonoma model disposable foodware ordinance as amended by Sebastopol and Santa Rosa.		
CLM-1: City Integrated Pest Management Plan. Update the Integrated Pest Management Plan to eliminate the use of toxic and polluting herbicides, pesticides, and fertilizers on City-owned property.	By 2026	City Landscape Management Strategy (CLM)
CLM-2: Comprehensive Land Management Plan. Adopt a comprehensive Land Management Plan and maintenance procedures for City properties that prioritize regenerative practices.		
CLM-3: Natural systems policy. Develop a natural systems policy that prioritizes nature-based systems and natural systems in capital improvements, planning, and programs.		
CE-2: Gas-powered lawn and garden equipment phase out. Ban gas-powered lawn and garden equipment in the city and establish a program allowing electric equipment to be charged throughout the day as it is used with a phase out strategy that is in alignment with state and regional goals and programs to ensure that the transition considers equity impacts.	By 2028	Clean Energy Strategy (CE)

* Implementation will depend on City Council prioritization and City staff and financial resources.

Plan Development Process

The Blueprint was developed as part of Petaluma's General Plan Update. It builds on the City's existing climate work and will help inform General Plan strategies. This Blueprint was written as an implementation step of the City's Climate Emergency Framework, a document that sets the guiding principles and subsequent planning efforts for the City to respond to the climate crisis.

Developing this plan was a collaborative effort among City staff, the Climate Action Commission (CAC), consultants at Raimi + Associates, and the community. Blueprint development engaged these stakeholder groups multiple times and in different capacities to solicit input and feedback on every aspect of the plan from the inventorying of emissions to brainstorming mitigation measures, and prioritizing implementation actions.

Based on stakeholder input and the commitment to take bold equitable action, the Blueprint mitigation measures are designed to put Petaluma on the pathway to carbon neutrality by 2030, which requires transformational change from both the City and community members within a short timeframe.

Organization of the Blueprint

The Blueprint is organized actions the City and community will need to implement to work towards carbon neutrality by 2030. It is important to note that the Blueprint provides guidance on what programs and policies the City should implement; as a planning document it does not undertake actual program development.

The Blueprint is organized in six chapters:

Chapter 1: Executive Summary establishes the context and vision of the Petaluma Blueprint for Climate Action and provides a summary of the City's priority actions.

Chapter 2: What is Climate Change? explains what climate change is and how it will impact Petaluma.

Chapter 3: Blueprint Approach lays out the concepts and other work that influenced the Blueprint's development, including the scope, equity considerations, community engagement, and other City plans.

Chapter 4: Our Community's Contribution to Climate Change describes the GHG emissions currently created from community and municipal sources, as well as what Petaluma's projected GHG emissions are in a Business-as-Usual Scenario and an Adjusted Business-as-Usual scenario.

Chapter 5: Greenhouse Gas Reduction Measure Action Plans contains seven plans detailing actions for City departments and partnership opportunities to reduce GHG emissions in specific sectors.

Chapter 6: Blueprint Implementation provides guidance for implementing the policies and programs called for in the Reduction Measure Action Plans.

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Chapter 2: What is Climate Change?

Human emissions of carbon dioxide and other greenhouse gas emissions (greenhouse gases) are important drivers of global climate change, and recent changes across the climate system are unprecedented. The majority of greenhouse gases emitted from human activities are from burning fossil fuels for transportation, electricity, and industrial production. They trap heat in the atmosphere which results in warming over time. This atmospheric warming leads to other changes in the Earth's systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. This chapter gives an overview of what climate change is and how it will specifically impact Petaluma.

Climate Change

Climate is the long-term behavior of the atmosphere – typically represented as averages – for a given time of year. This includes average annual temperature, snowpack, or rainfall. Human emissions of carbon dioxide and other greenhouse gas emissions (greenhouse gases) are important drivers of global climate change, and recent changes across the climate system are unprecedented. Greenhouse gases trap heat in the atmosphere, resulting in warming over time as shown in Figure 1. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. Human-induced climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes include more severe heatwaves, coastal flooding, heavy precipitation, droughts, and hurricanes.[3]

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[3] Intergovernmental Panel on Climate Change 2021. Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press.

Figure 3. The Greenhouse Effect

In the last century, human activities such as burning fossil fuels and deforestation have caused a jump in the concentration of greenhouse gases in the atmosphere. The result: extra trapped heat and higher global temperatures.

GREENHOUSE EFFECT
with normal greenhouse gases

GREENHOUSE EFFECT
with increased greenhouse gases

HEAT—ABSORBED BY LAND, OCEANS, AND ATMOSPHERE—WARMS THE PLANET

GREENHOUSE GASES

SOLAR RADIATION

HEAT IS RADIATED BACK INTO SPACE AS INFRARED LIGHT

SOLAR RADIATION

Some heat continues into space while the rest, trapped by greenhouse gases, help maintain the planet's relatively comfortable temperatures. Less gas = less heat trapped in the atmosphere.

Increased greenhouse gases means less heat escapes. Between preindustrial times and now, the earth's average temperature has risen 1.8 °F (1.0 °C).

Source: NRDC, 2019

California and Petaluma are already experiencing the effects of a changing climate. Both gradual climate change (e.g., sea level rise) and climate hazard events (e.g., extreme heat days), which expose people, infrastructure, buildings and properties, and ecosystems to a wide range of stress-inducing and hazardous situations. These hazards and their impacts disproportionately affect the most sensitive populations in the city, including children and elderly adults, low-income populations, renters, immigrants, and BIPOC residents, among others. These individuals may experience more negative health impacts from climate hazards. For example, children, pregnant women, older adults are more susceptible to heat illness in extreme heat events. Sensitive populations may have less capacity to adapt to climate shocks and stressors, such as how a low-income family renting an apartment does not have the ability to floodproof their residence.

While climate projections cannot predict what will happen at a certain date in the future, projections can provide cities with information about what to expect from the climate in the future. For example, climate projections can estimate how much warmer the temperature will be in summer or how many more extreme weather events are likely to occur in the future. Climate projections, however, cannot forecast with precision when those events will occur.

The extent of climate change in the future depends in part on the amount of greenhouse gas emissions now and in the future. Greenhouse gas emissions are driven by economic systems, land use patterns,

transportation and energy systems, and other social and political factors. Scientists use greenhouse gas emission scenarios to understand a range of potential climate projections. These include: a higher emission (or business-as-usual) scenario where emissions continue to rise, along with population growth through 2050 and plateau around 2100, and a lower-emissions scenario where emissions peak around mid-century then decline, due to worldwide efforts to reduce them.

Future climate projections are created using global climate models. These models simulate climate conditions both in the past and in the future. Climate scientists can use these models to assess how the climate will change (or not) based on scenarios of greenhouse gas emissions.

Potential Impacts of Climate Change Hazards in Petaluma

This section presents information on projected changes to natural hazards in Petaluma which are a product of climactic changes, including sea level rise, flood, drought and extreme precipitation, temperature, and wildfire.

Sea Level Rise

Sea level rise (SLR) is a rise in the average elevation of global oceans. In Petaluma, SLR will contribute to increased average water levels and flooding along the Petaluma River and its tributaries, as well as more frequent and severe tidal inundation. Higher River water levels can exacerbate existing and future flood hazards from severe storms, as well as alter the function of salt marshes and tidal flats near the confluence of Petaluma River and San Pablo Bay. As part of the ongoing General Plan Update process, the City of Petaluma is developing updated models regarding potential flooding impacts of sea level rise and climate change. The model evaluates and maps flood hazard areas given conservatively projected mid- and end-of-century sea level rise projections. The General Plan will address anticipated hazards related to flooding and sea level rise through land use decisions and adaptation policies.

Flood

The City of Petaluma is susceptible to various types of flooding events due to prolonged rainfall including riverine flooding, localized flooding, and levee failure flooding. During storm events, the San Francisco Bay and San Pablo Bay experience higher elevations of flooding due to storm surge (related to wind conditions in the Pacific Ocean), stronger waves, and increased inflows from rivers, increasing the San Francisco Bay elevation by upwards of 42 inches in a 100-year storm event. Because the City of Petaluma sits on a tidal slough, this increased Bay water elevation can cause flooding in low lying areas not near creeks, and cause backwater conditions which induce further flooding in the city.

The City of Petaluma is currently undertaking an update to the hydraulic model which develops flood risk maps for the Petaluma River watershed. The City's updated flood model will incorporate projections for other factors that influence flood risk, including sea level rise, astronomical tides and storm-induced bay water levels, precipitation intensity, and impervious land cover. The General Plan will address anticipated hazards related to flooding and sea level rise through land use decisions and adaptation policies.

Drought and Extreme Precipitation

Cal-Adapt illustrates a drought scenario termed a "mega-drought" that may increase the variability of the already highly episodic precipitation patterns for this region. Over the next 20 to 30 years, a drought scenario may reduce the average mean precipitation from 31 inches to 26.3 inches for the City of Petaluma as shown in Figure 4. In addition to less total precipitation, the length of dry spells is projected to increase, leading to longer dryer periods with little precipitation. When combined with above-average temperatures, drought is even more likely.

Figure 4. Petaluma Extended Drought Scenario 2023 - 2042 Precipitation (in Inches)

OBSERVED HISTORICAL
1961–1990 Average
31.0 inch

DROUGHT SCENARIO
2023–2042 Average
26.3 inch
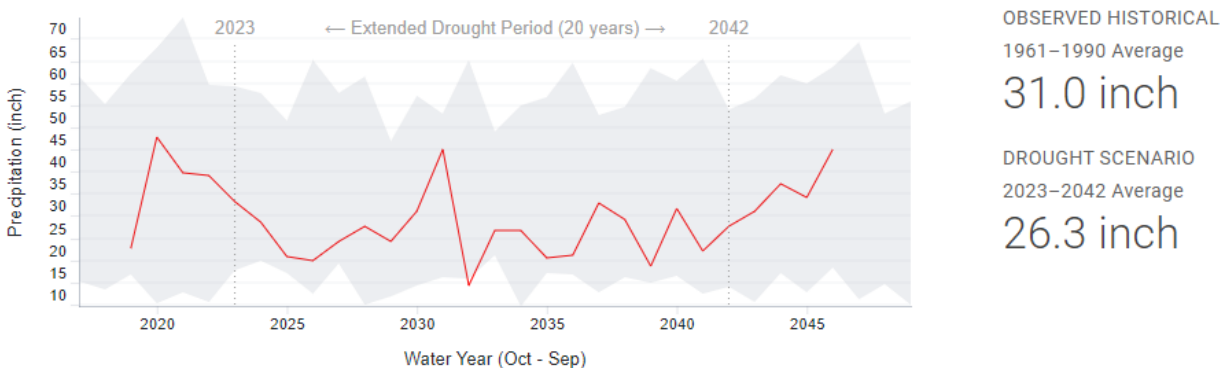
Source: Cal-Adapt, 2021

Precipitation in the Bay Area and Petaluma will continue to exhibit high year-to-year variability "booms and busts" with very wet and very dry years. According to California's Fourth Climate Assessment, there is projected to be an increase in the magnitude of large precipitation events - events can bring up to 50 percent of all rainfall for the year, yet only make up 17 percent of all precipitation events.[4] Increases in the largest precipitation events (measured in inches of rain per day) range from 6 percent to 21 percent in Representative Concentration Pathway (RCP) 4.5 and as high as 37 percent in RCP 8.5 by end of century (Figure 5).[5] Generally, the extreme storms in California deliver heavy precipitation over a narrow area and can cause flooding in areas typically prone to flood hazards. Additionally, research on extreme precipitation suggests that increased temperatures and more frequent short-duration, high intensity rainfall could increase the potential for flash flooding and debris flow, particularly after wildfires.[6]

Figure 5. Projected Extreme Precipitation Events in Petaluma
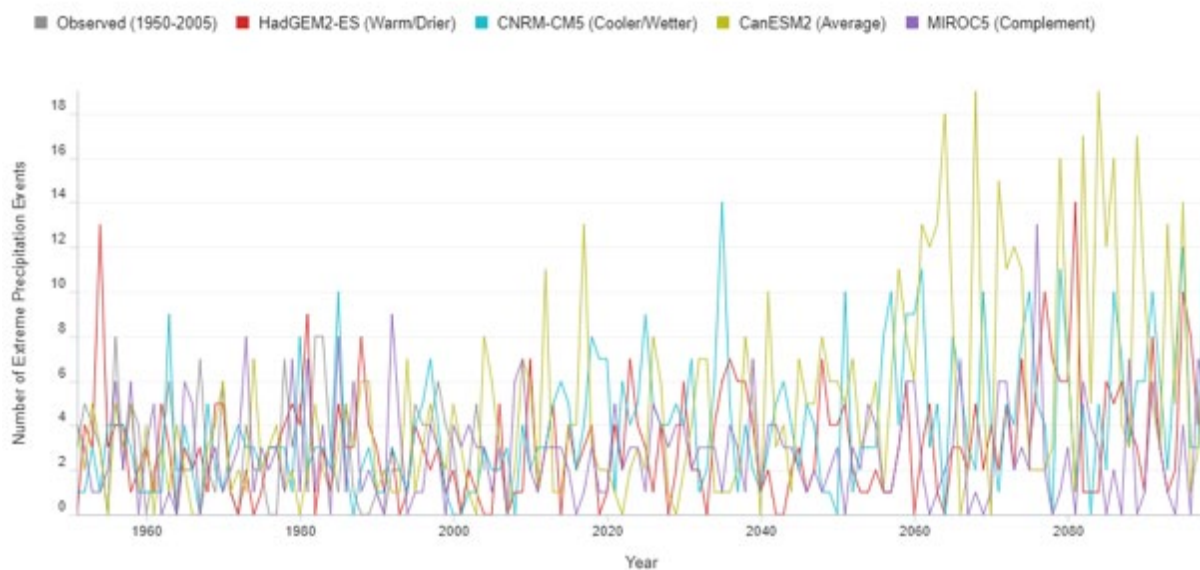
Source: Cal-Adapt, 2021

The occasional wet years do not necessarily reduce drought conditions from an ecological perspective. Even if there is greater precipitation, the projected increase in evaporative demand from higher temperatures implies that more water could be lost to the atmosphere and increase the possibility of drought. From a water supply perspective, variance in local precipitation and river levels can impact the levels of groundwater sources in the Petaluma Valley basin. However, as of 2020 it comprises less than 1 percent of the City's annual water supply, so the occasional wet year will not have an impact. A majority of Petaluma's water comes from Lake Mendocino and Lake Sonoma, which are fed by the Russian River. These sources are tied to larger statewide water storage, drought and snowpack conditions.

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[4] California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission. (2018). *Statewide Summary Report. California's Fourth Climate Change Assessment.*
[5] "Precipitation, Drought and Snowpack." California's Fourth Climate Change Assessment.
https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf
[6] "Extreme Precipitation Events." California's Fourth Climate Change Assessment.
https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf

Temperature

Petaluma is projected to experience a steady increase in the annual average maximum temperature as a result of climate change. According to Cal-Adapt's RCP 8.5 emissions scenario, the City of Petaluma is projected to experience an increase of 3.6° F from the observed baseline of 72.2° F by 2040. By the end of the century the annual average maximum temperature in Petaluma is projected to increase by 10.7° F to 82.9° F.

With rising average temperatures, the City of Petaluma is also expected to experience more extreme heat days, defined as days above 98° F. Cal-Adapt has projected that Petaluma will experience an increase from three days of extreme heat, in 2005 to six days by 2040 (using the high emissions RCP 8.5 scenario). By the end of the century, as many as 18 days of extreme heat are projected to occur each year between 2060 and 2099. This illustrates a dramatic rise in extreme heat days as a result in increasing annual average maximum temperatures, as shown in Figure 6.

Figure 6. Projected Extreme Heat Days in Petaluma
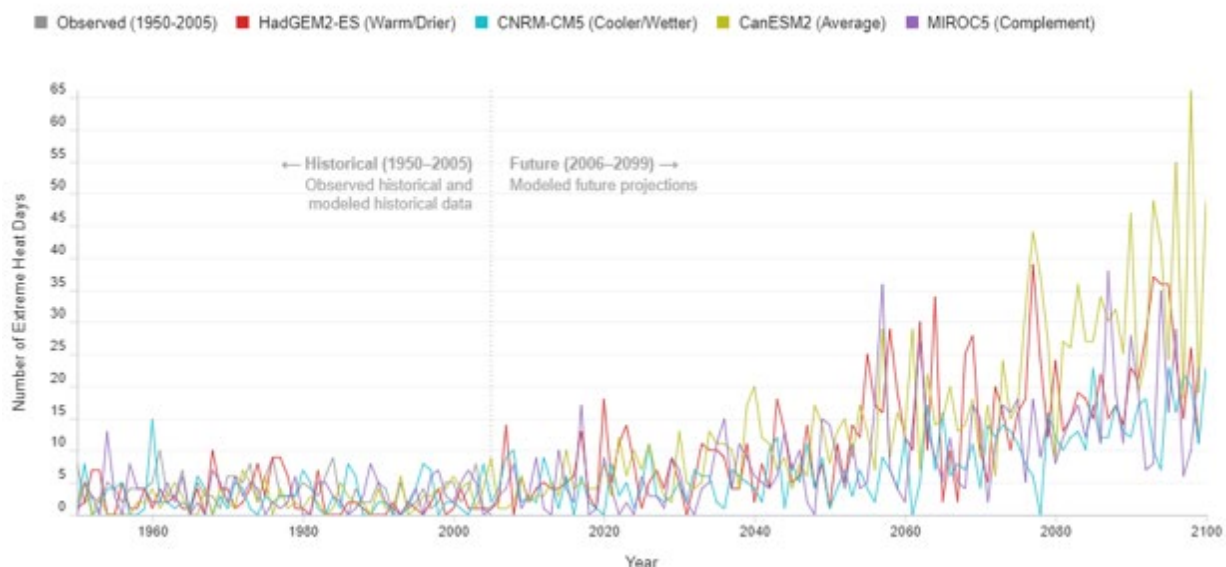
Source: Cal-Adapt, 2021

These impacts are expected to influence health and prosperity through the increased burden on local resources to mitigate extreme heat days, the exacerbations of wildfires, heavy precipitation events, and droughts which are all enhanced by increased temperatures. An increasing annual average maximum temperature for Petaluma will make wildfire ignitions more likely, intensify heavy precipitation events such as atmospheric rivers, and prolong and intensify the impacts of droughts and drought-like conditions.

Wildfire

Climate change has the potential to affect multiple elements of the wildfire system, including fire behavior, ignitions, fire management, and vegetation fuels. Warming temperatures, drought, and the expansion of development into the wildland-urban interface are projected to increase fire risk in most of the Bay Area.

The Local Hazard Mitigation Plan (LHMP) for Petaluma has indicated a relatively low probability of a fire event occurring within the City limits. Most of the city is within a 25 percent or less percent chance of a fire occurring between the years 2026 and 2050 except for the southwest corner of the city that includes the Helen Putnam Regional Park. This area has a 34 percent to 50 percent probability of a fire occurring. Climate change will play a role in how wildfires behave, the frequency of ignitions, fire management strategies, and fuel loads. Increasing temperatures will intensify wildfire threat and susceptibility to more frequent wildfires in the grasslands that surround the City limits, in addition to wildlands throughout Sonoma County. Though there may be less fire risk in Petaluma than in other parts of Sonoma County, Petaluma often assists with regional disaster response, including opening emergency shelters for people and animals. Increased fire risks in other parts of the region may lead to increased demand for assistance, as well as a potential for increased demand for permanent housing in Petaluma as a result of the relatively low fire risk in the city compared to the rest of the region.

In Figure 7 below, Cal-Adapt provides projections for annual area burned under the high emissions RCP 8.5 scenario. The various climate models do not indicate a unified trend, as the area burned each year is highly variable depending on a slew of factors like drought period, vegetation moisture levels, density of fuel, and weather. Human activity also plays a part, as 85 percent of all fires in the state are ignited by people.[7] However, we do know that climate change impacts will add intensity to wildfires due to longer warmer seasons, reduced distribution of biodiversity, lack of moisture, changes in ecosystems, drought impacts (e.g., pest diseases and continued spread of invasive species), and other such factors in coming years.[8]

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[7] California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission. (2018). *Statewide Summary Report. California's Fourth Climate Change Assessment*.
[8] Ibid.

Figure 7. Modelled Annual Area Burned under a High Emissions Scenario in Petaluma
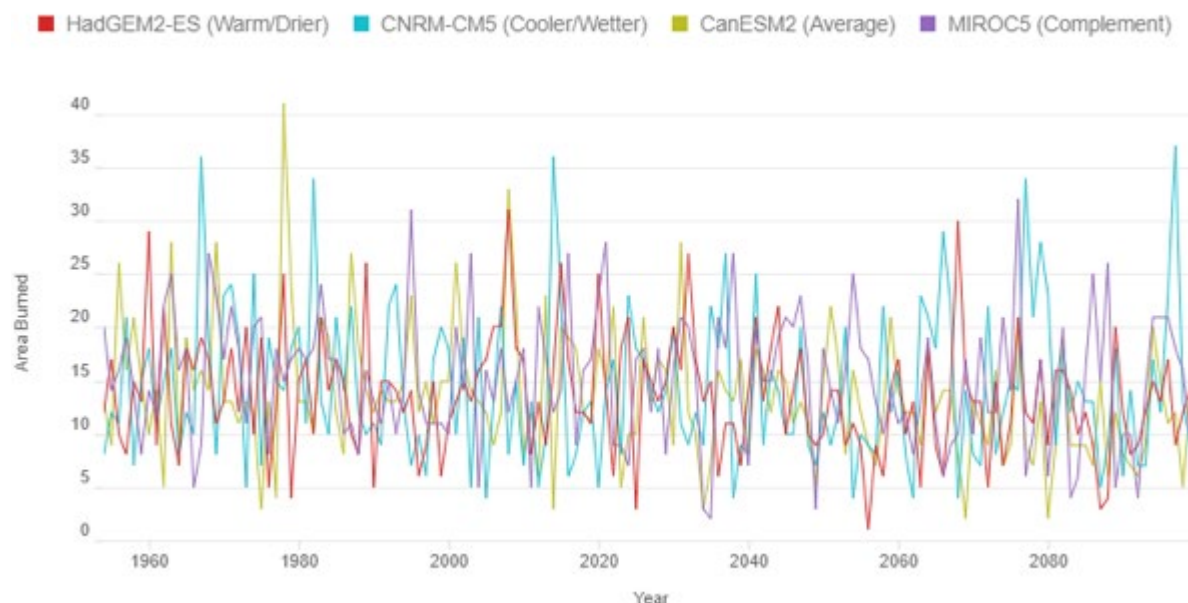
Source: Cal-Adapt, 2021

Impacts to Disadvantaged Communities

Climate change is expected to create a series of shocks and burdens that Petaluma's underserved communities will experience more acutely due to their limited options and resources for avoiding, recovering from, or adapting to the damage caused by climate change. Understanding how place, demographics, and socioeconomic status contribute to climate change vulnerability helps identify avenues for policy and/or programmatic interventions to relieve the burden on disadvantaged communities.

Overall, there are many social, economic, and environmental factors that influence community and individual vulnerability to climate impacts and their ability to adapt to climate change. For example, outdoor workers are at greater risk of heat stroke and related illnesses from extreme heat events, lower income residents have fewer resources to repair flood or fire damage and may live in poor housing conditions, and people with limited English language proficiency are less likely to access programs that could help during or after an extreme weather event. Moreover, individual biological factors, such as age or health status, can amplify a population's sensitivity to climate change.

What is a DAC?

According to state law, a "disadvantaged community" (DAC) is defined as: a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation." DACs are geographically defined rather than defined by demographic characteristics.

Low-Income **+** High Pollution and Health Burden **=** Disadvantaged Community

Knowing which areas of Petaluma have more vulnerable residents helps decision-makers prioritize where and how to allocate resources when wildfires, extreme heat events, and other climate-related hazard events occur. As part of the General Plan Update process, the City prepared an existing conditions analysis of community health and environmental justice conditions pursuant to the requirements of SB 1000.[9] The analysis identified nine census tracts or block groups in Petaluma that were identified as "Equity Priority Areas" based on the analysis of existing conditions related to health equity, environmental justice, and social vulnerability. Those geographies are illustrated in Figure 8.

Within Petaluma, census tract 1506.09 in the city's Northeast and North McDowell Blvd subareas is particularly burdened based with multiple health and environmental burdens: traffic impacts; solid waste sites; diesel particulate matter; low life expectancy; highway-related air pollution; low active commuting rates; and low proximity to high-frequency transit. This tract also scored within the top 25% of social vulnerability in Sonoma County, with high scores on the following household and housing/transportation indicators: aged 65 or older, person with a disability, and living in mobile home.

Figure 8. Equity Priority Areas (Draft 2022)
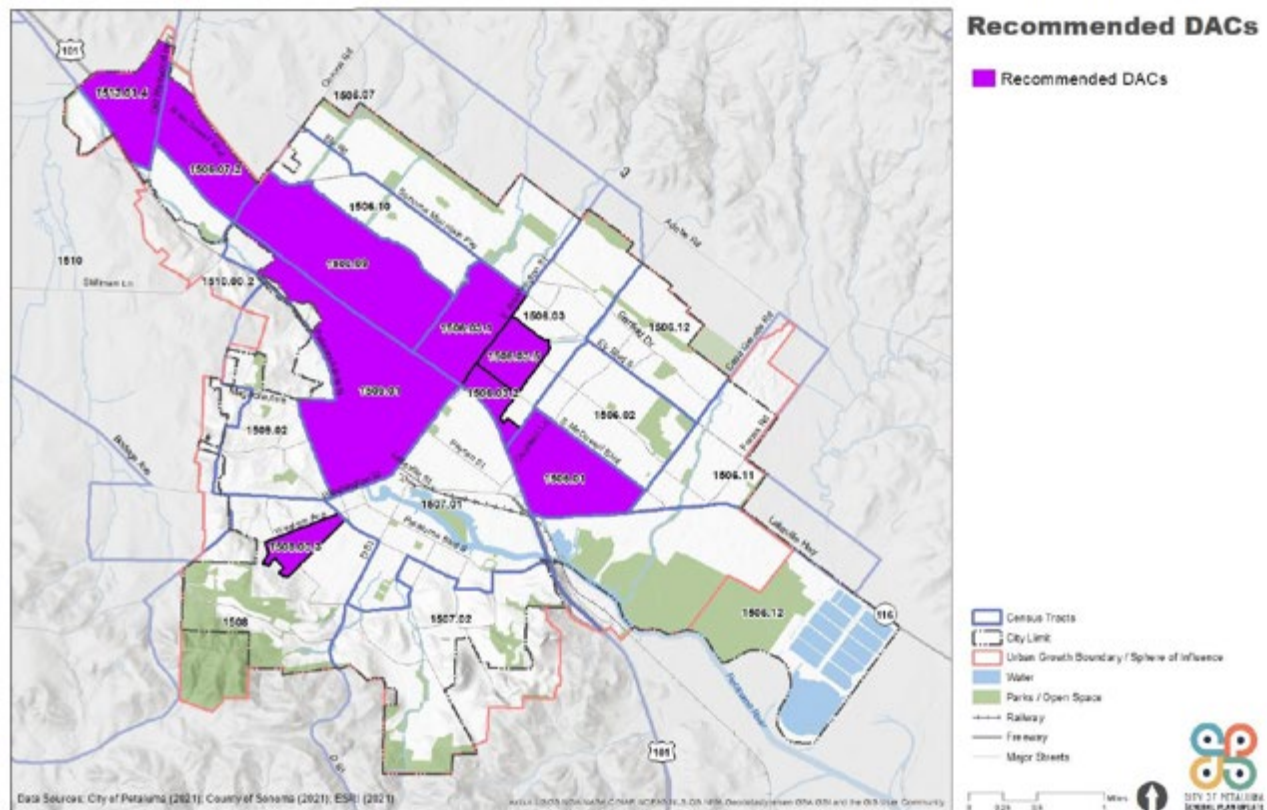
Source: City of Petaluma, Health and Environmental Justice Existing Conditions Report

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[9] For full analysis and methodology, see Existing Conditions Analysis: Health & Environmental Justice
https://static1.squarespace.com/static/5ea880f6d9a2075c7b7f54af/t/617311a72d495568d8ca9059/1634931123570/PetalumaGPU_HEJ_Report_FINAL_102121.pdf

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Chapter 3: Blueprint Approach

The Blueprint for Climate Action serves as the City's Greenhouse Gas Reduction Plan that strives to achieve carbon neutrality by 2030. The Blueprint is intended to be a living document that is monitored, evaluated, and updated to reflect a changing climate landscape as well as implementation successes, challenges, and the availability of resources and information. This is a very ambitious plan, and the City recognizes that it will need to continue to learn and adapt throughout the Blueprint implementation process in order to best respond to community needs, support equitable GHG reductions, and take adaptive or corrective action.

Blueprint Scope

The Blueprint is the roadmap for Petaluma to be on the pathway to carbon neutrality by 2030. It contains reduction measures and actions that City departments need to implement to reduce communitywide and municipal GHG emissions. It focuses on the reduction of activity based GHG emissions, which are the emissions associated with the operation of buildings, vehicles, waste, and water use.

The Blueprint is to guide the creation of City programs, policies, campaigns, and other efforts that reduce direct emissions. The GHG reduction measure action plans provide guidance for City departments and highlight opportunities to partner with other local and regional agencies and community-based organizations. As a mid- to long-range planning document, the Blueprint's scope is limited to outlining what programs the City needs to develop in the future, not the development of the programs themselves. Consumption-based emissions, which are the indirect emissions associated with the entire lifetime of goods and services, are considered as part of Petaluma's overall sustainability effort, but are not quantified in the Blueprint's GHG reduction analysis and measures. While they will be reduced by the actions in the Blueprint, they mostly fall outside of the systems over which the City, as a governmental agency, has control. Therefore, the City's influence on consumption emissions comes from the ability to educate the public and galvanize individual action on reducing consumption-based emissions.

While originally linked to climate adaptation, those strategies will be completed separately, in concert with the General Plan Update effort. Given the need to reduce emissions quickly, in line with the City goal of carbon neutrality, the Blueprint was moved forward more quickly.
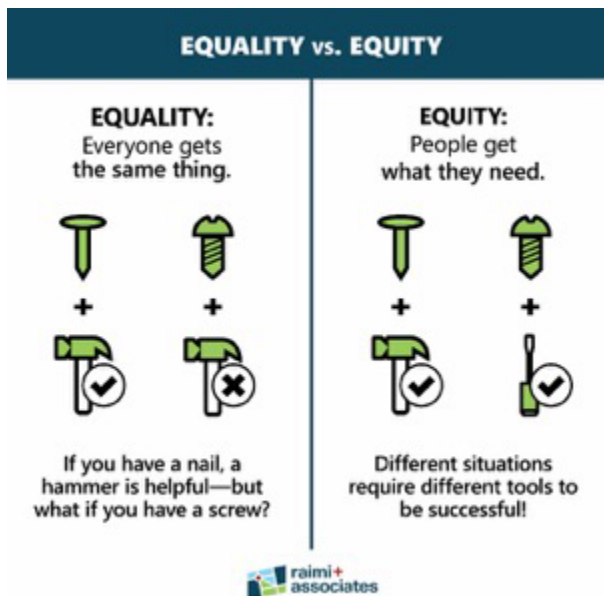
Equity Considerations

One of the key purposes of the Blueprint is to set Petaluma on the path of equitable climate action and adaptation. Although equity is like equality, they are not the same thing. Equality means everyone receives the same thing regardless of any other factors. Equity, on the other hand, aims for equal outcomes and is about ensuring that all people have access to the opportunities they need to thrive and succeed. Figure 9 provides a visual representation of this distinction.

Disadvantaged communities are often burdened with multiple, overlapping challenges that cumulatively impact their ability to adapt or respond to climate change. Structural and institutional racism in economic, government, and social systems has resulted and continues to result in the disproportionate distribution of climate burdens and exposures, such as a low tree canopy coverage and a high concentration of impervious surfaces. In addition, a growing body of social epidemiological research has found that repeated experiences of racism become biologically embedded in the body and results in "weathering" or premature physiological deterioration.[10] This is relevant to the population's sensitivity to climate hazards, as having a chronic illness (e.g., heart condition, lung condition, obesity) makes people more likely to experience health effects from extreme heat, wildfire, and other hazards.[11]

Figure 9. Equality vs. Equity

Prioritizing the needs of Equity Priority Areas creates the conditions and environment for all Petaluma residents to be healthy and to thrive. Everyone in Petaluma deserves the right to experience a healthy, sustainable future. It is ethically imperative to solve the climate crisis while simultaneously addressing the crisis of inequity in the community which threatens successful climate action and collective empowerments. By leading with an equity lens, Petaluma aims to divest from systems that harm public health, the economy, and the environment, and instead invest in community-based solutions that create community stability, greater public health, and economic well-being for all community members.

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[10] Geronimus, A. T. (2023). Weathering: The Extraordinary Stress of Ordinary Life in an Unjust Society. Little, Brown Spark.
[11] US Environmental Protection Agency. (2021). *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts.*

Types of Equity

There are a variety of ways the City can work to support equity. These include Procedural, Distributional and Structural Equity.

Procedural Equity:

- Transparent, fair, and inclusive process
- Ensure all are treated openly and fairly
- Increase civic engagement opportunities

Distributional Equity:

- Fairly distribute resources, benefits, and burdens
- Prioritize resources for communities that experience greatest inequities and unmet needs

Structural Equity:

- Make a commitment to compensate for past harms and prevent future unintended consequences
- Address underlying structural and institutional systems that are the root causes of social and racial inequities

Key equity considerations for the Blueprint GHG reduction measures include:

- That the benefits of GHG reductions reach those who are most impacted by climate change and/or sensitive to its negative effects
- That multiple facets of equity are addressed
- That programs are put in place to assist low-income Petalumans with the costs of implementing GHG reduction measures
- That barriers related to language ability, housing tenure, and other socioeconomic factors are addressed, so that all Petalumans have access to opportunities to take climate action
- That the City performs outreach to community groups to hear concerns, elicit input, and directly engage on climate policies and programs
- That measures to reduce GHG emissions do not further patterns of inequitable air pollution emissions

To ensure that all programs and policies are developed with equity implications in mind, an Equity Implementation Tool is included in Appendix B. This tool is intentionally designed to guide City staff in thinking through ways to incorporate racial equity into the programs and initiatives called for in the Blueprint.

CEQA Qualified Plan

The greenhouse gas reduction targets specified by the State are consistent with substantial scientific evidence published by the Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) regarding the need to reduce global greenhouse gas emissions to 80 percent below 1990 levels by 2050. This consistency is important for creating a "qualified" CAP. The concept of having a "qualified" CAP means that a CAP meets the criteria specified in CEQA Guidelines Section 15183.5(b) for a plan for the reduction of greenhouse gas emissions, such that a "qualified" CAP may then be used for the specific purpose of streamlining the analysis of greenhouse gas emissions in subsequent projects. Local governments have discretion on what levels or targets are established in a "qualified" CAP, provided they address adopted policies and are based on substantial evidence. Most often, local targets align with the California Senate Bill 32 reduction requirement of a 40 percent reduction below 1990 levels by 2030 to achieve qualified status. The Blueprint greenhouse gas reduction has demonstrated the ability to achieve a 60 percent reduction by 2030 (exceeding the requirement of 40 percent), if implemented as outlined in Chapter 5: GHG Reduction Action Plans. Achieving carbon neutrality will require advancements in technology, State and Federal policies, and additional changes to individual lifestyle choices. This is unlikely to occur by Petaluma's target year of 2030 but can be realized with a longer-term timeline.

Community Engagement Process

Petaluma's most important stakeholders are its community members. Community engagement is a critical part of building support, a community sense of ownership, and desire to act on climate change and its impacts. The City has prioritized reaching out to the community to discuss climate issues, and to respond to community concerns and ideas on the topic. Petalumans have been extremely active in advocating, educating, and communicating both within the community and with the City on climate action and adaptation.

Ongoing Climate Engagement in the City

Petalumans have galvanized around the issue of climate change and have many avenues of community engagement around climate action and adaptation. There are ongoing efforts within the City government infrastructure including the Climate Action Commission and the Climate Ready campaign. There are also grassroots community-led efforts underway, including Cool Petaluma and Petaluma Equitable Climate Action Coalition.

Climate Action Commission

The Climate Action Commission (CAC) was established in 2019 to perform duties pertaining to advising on climate action policies and their implementation within the City. It serves as a forum for the consideration, analysis, and coordination of climate action related City policies, and advises the City on matters referred by City departments and other Council-appointed hearing bodies.

Climate Ready Petaluma 2030

Climate Ready 2030 is the City's campaign to work with the community in acting decisively, joining and inspiring others, and initiating a movement to rehabilitate ecological balance, restore economic stability, and achieving the goal of carbon neutrality in the city. The City maintains a page on its website[12] that highlights actions community members can take and what the City is doing to reduce GHG emissions.

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[12] City of Petaluma. Climate Ready. https://cityofpetaluma.org/departments/climate-ready-2030/

General Plan Update

The General Plan update process, which began in 2020, will include the creation of climate-related policies and actions that reinforce this Blueprint, and plan for climate adaptation and resiliency.

Cool Petaluma

Cool Petaluma is a grassroots effort that launched in January 2022 that mobilizes volunteers to prepare for emergencies, reduce carbon emissions, save water, and build vibrant communities at the block and neighborhood scales.[13] Cool Petaluma trains community leaders to create Teams on their blocks and work on individual and collective action with five objectives: prepare for emergencies, rethink consumption, transform transportation, improve buildings, and restore nature.

Petaluma Equitable Climate Action Coalition

Petaluma Equitable Climate Action Coalition (PECAC) was a program from September 2022-March 2023 designed to empower the voices of community members most impacted by our transportation systems and climate change, and who have historically been underrepresented in decision making. PECAC was a platform to give input and issue recommendations on how the City of Petaluma can prioritize policies, programs, and resources to address transportation equitably.[14] PECAC recommended that the City take action to make walking safer, make biking safe and convenient, and invest in creating a dignified bus riding experience, among others.[15]

Blueprint Engagement

The City of Petaluma understands how crucial community input is in understanding and addressing climate change mitigation, resilience, and adaptation. Community members – residents, businesses, visitors, and others – offer unique knowledge, perspectives, and experiences navigating the impacts of climate shocks and stressors in the city. Community members will also be called upon to be active participants in climate mitigation and resilience measure implementation. The City created and

Source: Cool Petaluma

executed a public participation plan to ensure that community members and other stakeholders had a diversity of opportunities to share their opinions and take part in the development of the Blueprint. This section describes the community engagement activities and the key themes heard during the process.

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[13] Cool Petaluma. About. https://www.coolpetaluma.org/about
[14] Daily Acts. Petaluma Equitable Climate Action Coalition (PECAC). https://dailyacts.org/climate-action/
[15] Petaluma Equitable Climate Action Coalition. (2023). Equitable Climate Action Recommendations. https://dailyacts.org/wp-content/uploads/2023/03/2022-PECAC-Final-Presentation.pdf

Climate Action Commission: The CAC was engaged on several occasions to provide input related to mitigation measure development. Engagement activities included discussions at regular meetings, the creation of theory of change maps for each climate sector, and the solicitation of expertise through sector-specific ad-hoc meetings.

Cool Petaluma Volunteers: The City utilized the Cool Petaluma team to reach out to the broader community about climate action. They will also played a key role in helping the City to understand more about local consumption-based emissions.

Community Engagement: The Draft Blueprint was posted for community review and comment through November 2023. The City alerted community members to the publication of the draft Blueprint through social media and community emails, as well as mentioning it during public meetings.

Relationship to other City Climate Efforts

The Blueprint complements Petaluma's numerous other climate-related long-range planning efforts. Measures in the Blueprint will be consistent with the relevant climate and resilience policies outlined in those documents.

Climate Emergency Framework

The Climate Emergency Framework[16] is the result of collaboration of the Petaluma Climate Action Commission with input from City staff and volunteers in the community. Its purpose is to outline principles to guide the City's ongoing response to and discussion about the climate crisis and to guide and inform subsequent policies and implementation strategies. These principles establish Petaluma's shared vision of a healthy, sustainable, and equitable community. By setting the shared intention of this framework and working from the framework in subsequent planning efforts to create policy and implementation, the City will actively work to avoid catastrophic climate change and adapt to its expected impacts. The Climate Emergency Framework also provides the overarching vision and values for the Blueprint, which includes the vision for Petaluma to be carbon neutral by 2030.

General Plan Update

The General Plan is a long-range policy document that maps out how the City of Petaluma serves its community. California law requires that every city and county in the state develop and maintain a General Plan. The General Plan sets forth a shared 20-year vision for the future. It builds on community strengths and assets, while tackling new and emerging challenges like climate change. The Blueprint's greenhouse gas forecast and analysis are based on the General Plan's growth projections.

The General Plan is expected to be completed in 2025. Blueprint strategies will help to inform General Plan policy development and ensure that climate is considered throughout all elements of the Plan.

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[19] City of Petaluma. (2021). Climate Emergency Framework.
https://storage.googleapis.com/proudcity/petalumaca/uploads/2021/02/Climate-Action-Framework_Final.pdf

Additionally, the General Plan will include policies and strategies related to climate adaptation and resilience that respond to the climate hazards facing Petaluma.

Active Transportation Plan

The Pedestrian and Bicycle Advisory Committee (PBAC) is currently working with the City to update the City's Active Transportation Plan (ATP). The ATP will present strategies to encourage walking and biking within the city by making local roads safer and enhancing the pedestrian and bicycle networks. The ATP outcomes will feed directly into the City's General Plan update and are critical measures to reduce community transportation-related emissions as outlined in the transportation sector of the Blueprint.

VMT Reduction Strategy

The City is developing a VMT Reduction Strategy to identify near-term actions to reduce vehicle miles traveled (VMT) that can be included in the Capital Improvement Plan or ordinance updates. Categories of potential actions include investing in VMT reducing infrastructure, shifting travel behaviors through transportation demand management (TDM) programs, and conducting public outreach.

Local Hazard Mitigation Plan

The Local Hazard Mitigation Plan (LHMP) Update,[17] adopted in 2020, is a document that aims to make Petaluma residents less vulnerable and more resilient to future hazard events. It analyzes a wide array of hazards, not just those that are related to or exacerbated by climate change. The Blueprint builds on the findings and recommended mitigation actions from the LHMP in relation to climate-related hazards including sea level rise, flooding, extreme heat, and wildfire. However, one point of departure between the LHMP and Blueprint is that the Blueprint contains measures to reduce GHGs and mitigate climate change. In contrast, the LHMP's purpose is to protect people and property from the effects of hazardous events.

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[17] Wood Environment & Infrastructure Solutions, Inc. City of Petaluma Local Hazard Mitigation Plan. City of Petaluma, Nov. 2020, page 4-111, https://cityofpetaluma.org/documents/lhmp/

Chapter 4: Our Community's Contribution to Climate Change

Current Emissions Profile

Community GHG Inventory

The 2018 Community Greenhouse Gas Inventory[18] serves as the foundation for projecting emission trends and informing measures and actions that the City needs to implement to achieve carbon neutrality by 2030. The inventory captures communitywide emissions generated from transportation, energy consumption in homes and buildings, solid waste, water, and off-road transportation (e.g., emissions from construction, landscaping equipment, etc.) within the city. It was developed using the ICELI Global Protocol for Community-Scale Greenhouse Gas Emission Inventories.

The City of Petaluma's total 2018 GHG emissions are estimated to be 472,422 $MTCO_2e$, an increase of 12,067 $MTCO_2e$ from the 2010 baseline year. Of the five sectors, on-road transportation accounted for the largest amount of GHG emissions, with estimated emissions of 314,493 $MTCO_2e$, or 67 percent of total emissions. The second largest sector was residential energy use, with estimated emissions of 60,409 $MTCO_2e$, or 13 percent of total emissions. The remaining 20 percent of emissions were made up of nonresidential energy, solid waste, off-road transportation, and water and wastewater, as shown in

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[18] See Appendix C: 2018 Community GHG Inventory

Table 32 and Figure 109.

Table 2. 2018 Total Annual Community GHG Emissions

Community Sector	Subsector	Subsector MTCO$_2$e	Sector MTCO$_2$e	Percent of Total
Transportation	On-Road Transportation	314,493	314,493	67%
Energy	Residential	60,409	114,475	24%
	Nonresidential	54,065		
Solid Waste	Residential	12,669	33,137	7%
	Commercial	20,468		
Transportation	Off-Road Transportation	9,727	9,727	2%
Water and Wastewater	Water Use	73	590	0.1%
	Wastewater Treatment	517		
Total		**472,422**		**100%**

Sources: City of Petaluma, 2021; Raimi + Associates, 2021.

Figure 10. 2018 Percentage of Annual Community GHG Emissions by Sector
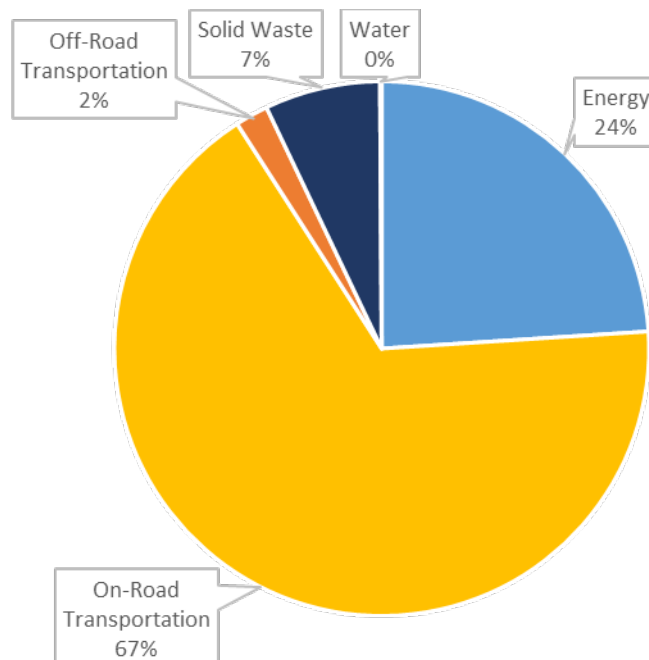
Municipal GHG Inventory

City of Petaluma municipal operation emitted an estimated 3,653 MTCO$_2$e from its operations in 2019, representing less than one percent of communitywide emissions as shown in Table 3 and Figure 11.[19,20] These emissions were produced by buildings and facilities, employee commute, fleet vehicles, transit fleet vehicles, and wastewater sectors. This inventory also includes the streetlights / traffic signals and airport facilities, but those sectors did not have any recorded emissions. These facilities and infrastructure use carbon-free electricity and did not report any natural gas consumption.

Of the sectors inventoried, the vehicle fleet comprised the largest portion (31 percent) of the total municipal operations emissions in 2019. Employee travel was the second largest source, accounting for 27 percent of emissions.

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[19] See Appendix D: 2019 Municipal GHG Inventory
[20] The Petaluma Community GHG Inventory estimated 2018 emissions.

Table 3. 2019 Total Annual Municipal GHG Emissions by Sector

Sector	Emissions (MTCO$_2$e)	Percent of Total
Buildings and Facilities	701	19%
Streetlights and Traffic Signals	0	0%
Airport Facilities	0	0%
Employee Travel	982	27%
Vehicle Fleet	1,143	31%
Transit Fleet	662	18%
Wastewater	165	5%
Total	**3,653**	**100%**

Sources: City of Petaluma, 2021; Raimi + Associates, 2021.

Figure 11. 2019 Percentage of Total Annual Municipal GHG Emissions by Sector
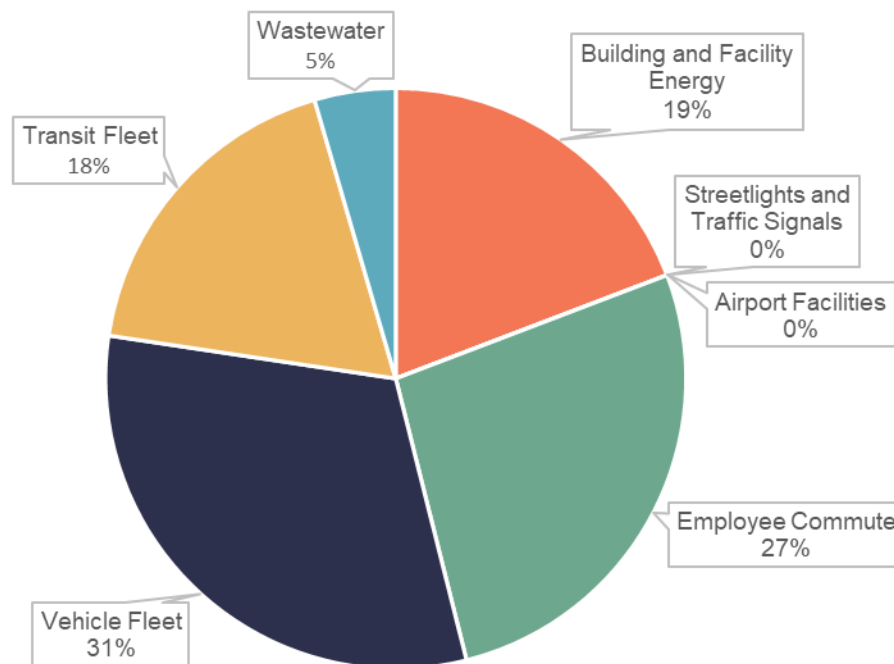
Consumption-Based GHG Inventory

Petaluma's Climate Emergency Framework calls for the reduction of indirect emissions in addition to elimination of direct emissions, which are accounted for in the community and municipal inventories above, to meet State, County, and City climate goals. Measuring consumption captures both the direct and lifestyle emissions of the goods and services Petaluma residents use (transportation, housing, food, goods, services, and composting). Emissions are created at all lifecycle stages of those categories: from their raw materials, manufacturing, distribution, retail, and disposal.

Petaluma's consumption emissions were estimated during a study conducted by UC Berkeley and the Bay Area Air Quality Management District in 2015. This method results in a total of 1.2 million MTCO$_2$e, about 146 percent higher emissions than the traditional activity-based approach for Petaluma in 2015 and 150 percent higher than the activity-based emissions in 2018. This is largely due to higher emissions from transportation and the inclusion of emissions from food, goods, and services. Transportation remains the largest source of emissions (35 percent), followed by food (19 percent), services (17 percent), goods (17 percent), and housing (which includes electricity consumption) (14 percent). Composting reduces one percent of total GHG emissions. In total, the average Petaluma household's consumption-based emissions were 44.1 MTCO$_2$e in 2015.[21]

Figure 12. 2015 Consumption-Based GHG Emissions per Petaluma Household
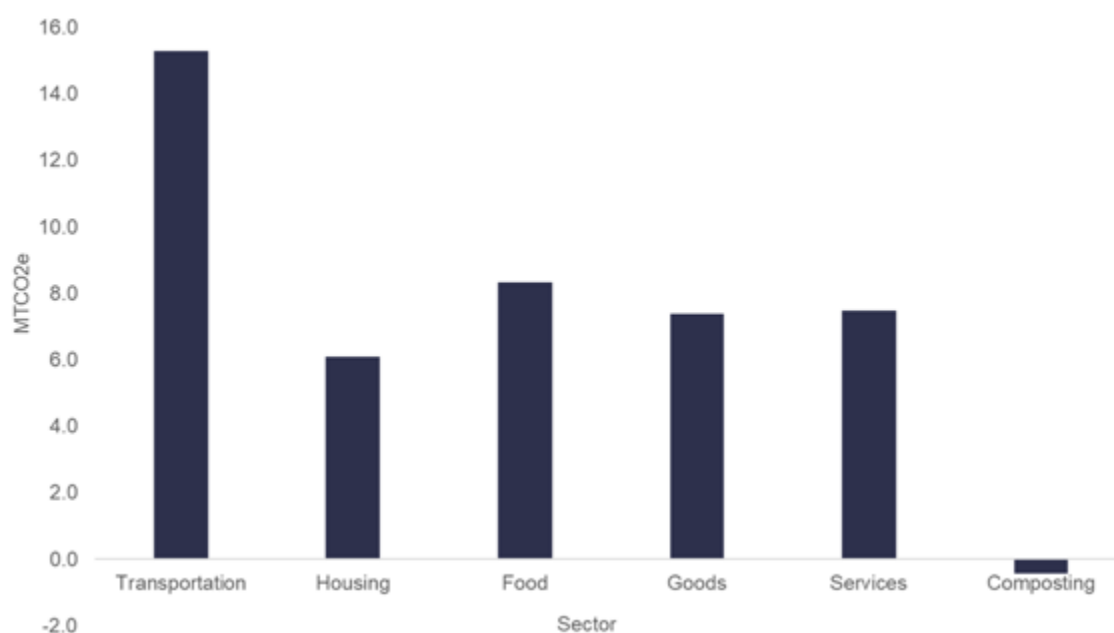
Source: UC Berkeley and BAAQMD, 2015

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[21] UC Berkeley and the Bay Area Air Quality Management District. Consumption-Based Greenhouse Gas Inventories. Retrieved from: https://coolclimate.org/inventory

GHG Forecast and Reduction Target

Two emissions forecasts were prepared to estimate Petaluma's emissions from 2019-2030 as presented in Figure 13. They consider how emissions may change with projected increases in housing units (+8 percent), jobs (+15 percent), and population (+6.5 percent) by 2030. These forecasts show the emissions reductions the Blueprint actions will need to achieve to become carbon neutral by 2030.

- **"Business as Usual" (BAU):** GHG emissions forecast considers how Petaluma's emissions would change over time if <u>no action</u> were taken to reduce emissions by the State or at the local level. BAU forecast emissions are expected to rise from 472,442 $MTCO_2e$ in 2018 to 525,433 $MTCO_2e$ in 2030, an 11 percent increase.
- **Adjusted Business as Usual (ABAU):** This forecast shows how Petaluma's emissions are anticipated to change accounting for the impacts of <u>adopted State policies</u> without local action. Under the ABAU forecast, emissions are expected to fall from 472,422 $MTCO_2e$ in 2018 to 428,527 $MTCO_2e$ in 2030, a 9 percent decrease.

The bold carbon neutral target set forth in this plan demonstrates Petaluma's commitment to mitigating climate change and the adverse impacts it causes. Figure 13 also illustrates the forecasted emissions for the BAU and ABAU scenarios in relation to the carbon neutral by 2030 target.[22] Figure 15 in Chapter 5 illustrates the projected GHG emission reductions from the implementation of this Blueprint as "Aggressive Climate Action."

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[22]Figure 13 illustrates how the Business as Usual and Adjusted Business as Usual GHG forecasts compare to the carbon neutral target. For information on the results of local GHG reduction measures, see Figure 15 in Chapter 5, which shows the trajectory of two different local action scenarios toward achieving the carbon neutral target.

Figure 13. 2030 Projected Emissions and Reduction Target
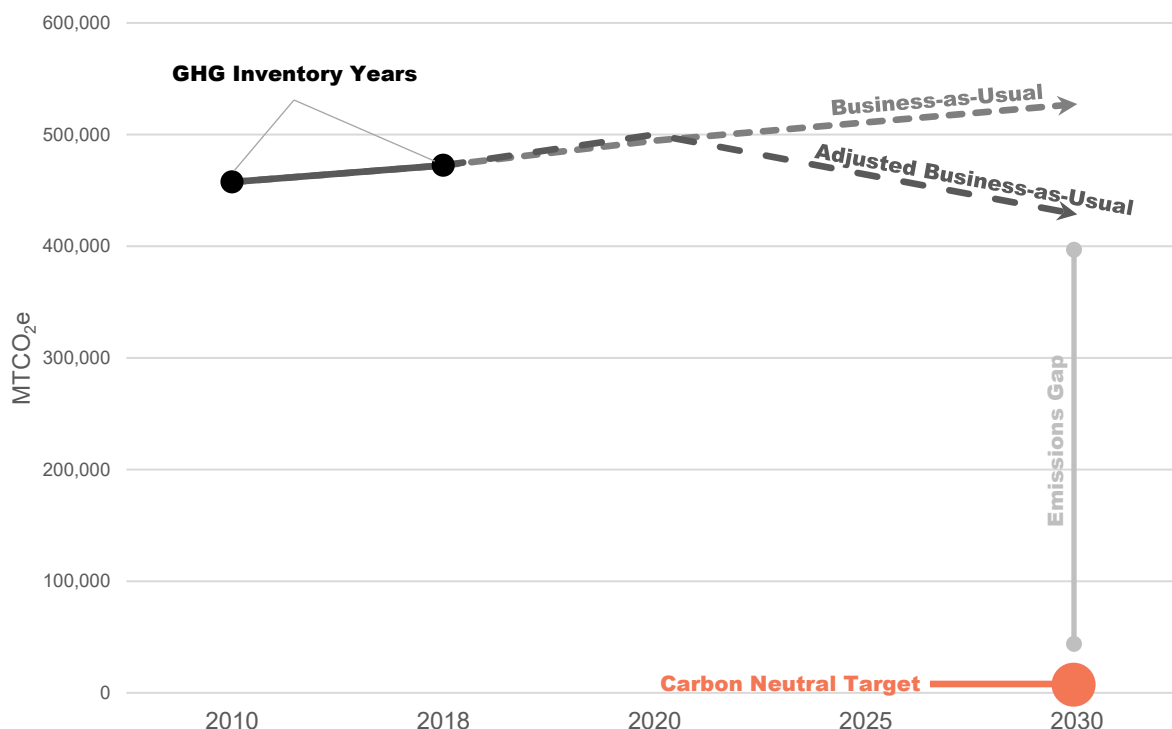
Source: Raimi + Associates, 2021

How to Respond to Climate Change

Responding to climate change entails both mitigation and adaptation. Climate change mitigation focuses on slowing the severity of climate change by reducing greenhouse gas emissions.[23] Climate change adaptation is taking steps to live with the effects of climate change and involves adjusting to the actual or expected future climate. Adaptation is focused on long-term threats to natural and human systems including human life, property, economic continuity, ecological integrity, and community function.[24]

Petaluma's goal of becoming carbon neutral by 2030 relates to climate change mitigation. In the Blueprint, Chapter 5: GHG Reduction Action Plans presents the framework of actions for the City to reduce community and municipal GHG emissions towards that target. The City will need help to get all the way to the carbon neutrality target. Achieving the target will require accelerated adoption of state climate laws contained in the State Scoping Plan, new sources of funding, technological advances, and community cooperation. Climate policy and technology is changing rapidly and being implemented more quickly than imagined. However, the City wanted to be realistic about what we can achieve today with our

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[23] CalOES. California Adaptation Planning Guide. https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf#search=adaptation%20planning%20guide
[24] Ibid.

existing staffing and resources. The City is committed to working towards this goal, leveraging new opportunities to reach even deeper reductions. The plan sets up monitoring and reporting frameworks to make adjustments and take corrective actions to meet our targets. The Blueprint reduction measure action plans also relate to adaptation because they produce co-benefits such as improving ecosystem health, environmental justice, and the local food system, for example. Although those benefits do not necessarily reduce GHG emissions, they are important to ensure Petaluma continues to thrive as the climate changes.

Chapter 5: GHG Reduction Action Plans

The extent to which Petaluma is impacted by climate change is dependent on community actions today. By curbing greenhouse gas emissions and adapting the community to an already changing environment, the City can significantly reduce the damage incurred from climate change. The City is in a unique position to become a statewide climate leader by implementing city-wide policies, incentives, and education programs to deploy innovative technologies, to pilot regulatory mechanisms, and spark behavioral change to meet the City's ambitious greenhouse gas reduction targets.

Petaluma has prepared this Blueprint to be a guide for the community's response to challenges posed by climate change, and to build on the City's ongoing efforts to mitigate and adapt to the impacts of climate change. This chapter summarizes the mitigation measures and actions that the City needs to implement to work towards becoming a carbon neutral city. This chapter includes Action Plans for the following emissions sectors:

1. *Municipal Operations*
2. *Clean Energy*
3. *Buildings*
4. *Transportation and Land Use*
5. *Water*
6. *Resource Consumption*
7. *Natural Systems and Sequestration*

Reduction Approach

Petaluma's target to achieve carbon neutrality by 2030 requires monumental shifts in all aspects of urban systems and people's lifestyles on an extremely accelerated timeline. Striving for carbon neutrality by 2030 will require transformational change to the built environment, street network and urban form, as well as a reimaging of daily life for Petalumans. It will take an immediate, coordinated "All of the Above" approach to put the City on the pathway to carbon neutrality. This means that we need to take action in all sectors as quickly as possible, engage all City departments and residents, and commit significant investment by the City and individuals. The City, community groups, and individual Petalumans must also advocate at the State level to push for more programs and policies to support equitable climate action. Community, City, State, National and global action will all impact Petaluma's ability to reach its climate goal.

Figure 14. Approach to Reduce Greenhouse Gas Emissions

2023-2027

Foundational focus on actions that will set the City up to successfully implement reduction measures in the future.

Actions include: growing participation in Sonoma Clean Power, adopting policies to decarbonize buildings, completing the General Plan, and initiating funding and facilitation programs.

2025-2028

Focus on urban transformation by implementing General Plan land use changes, upgrading infrastructure, and pusuing local sequestration projects.

Reevaluate Blueprint implementation process and adapt to changes in the environment, technology, and availability of resources.

2028-2030

Expand existing decarbonization programs and provide support for mandatory requirements through financing mechanisms and partnerships.

2030 and Beyond

Focus on enhancing equity in a post-carbon Petaluma, measure and reduce consumption-based emissions, and support neighboring communities in their climate action journey.

Greenhouse Gas Emissions Reduction Pathway

As illustrated in Figure 13 below, the City will need to proactively take ambitious climate action to reduce and offset greenhouse gas emissions to achieve local and State greenhouse gas reduction targets. State and regional policies and regulations are projected to reduce 2030 BAU emissions by 27 percent. In addition to the reductions realized through State policies, implementing the CAP mitigation measures can achieve the SB 32 goal of a 40 percent reduction in mass emissions by 2030 and puts the City on the path to achieving the long-term goal of carbon neutrality by 2030. Conservatively, these strategies achieve a 61 percent mass emissions reduction compared to 1990 levels in 2030. The range of climate action scenarios facing Petaluma, from least to most aggressive action, are listed below and illustrated in Figure 15:

- **Business-as-Usual (BAU):** This GHG emissions forecast considers how Petaluma's emissions would change over time if <u>no action</u> were taken to reduce emissions by the State or at the local level. (See Chapter 4 for GHG Inventory and Forecast).
- **Adjusted Business-as-Usual (ABAU):** This forecast shows how Petaluma's emissions are anticipated to change accounting for the impacts of <u>adopted State policies</u> without local action. (See Chapter 4 for GHG Inventory and Forecast).
- **Ambitious Climate Action:** This scenario requires the City and community to take <u>ambitious action within the realistic bounds of current capacity, technology, and State and Federal policy</u>. It models the GHG reductions from mandatory building and energy upgrades, resulting in: energy efficiency and decarbonization modifications in 40 percent of all buildings in Petaluma; 25 percent of all vehicles in Petaluma are electric; and 50 percent of all travel occurring in modes other than single-occupancy vehicles. The GHG reductions from the "Ambitious Climate Action" scenario are expected to be 256,720 $MTCO_2e$ in 2030, a 51 percent decrease compared to 1990 levels and a 60 percent reduction compared to forecasted emissions.
- **What Does it Take?:** This scenario requires the City and individuals to make dramatic changes in daily life or operations. It models the GHG reductions from mandatory building and energy upgrades, resulting in: energy efficiency and decarbonization modifications in 85 percent of all buildings in Petaluma; 25 percent of all vehicles in Petaluma are electric; and 75 percent of all vehicle miles traveled occurring in modes other than single-occupancy vehicles. The City will need to support these changes through significant investment in CAP implementation and program administration, land use, streets, active transportation, transit, and utility infrastructure. It also requires additional changes beyond the local level including accelerated State laws, new sources of funding, and technological advances. The GHG reductions from the "What Does it Take?" scenario are expected to be 12,600 $MTCO_2e$, a 97 percent decrease compared to 1990 levels.

Figure 15. Climate Action Scenarios
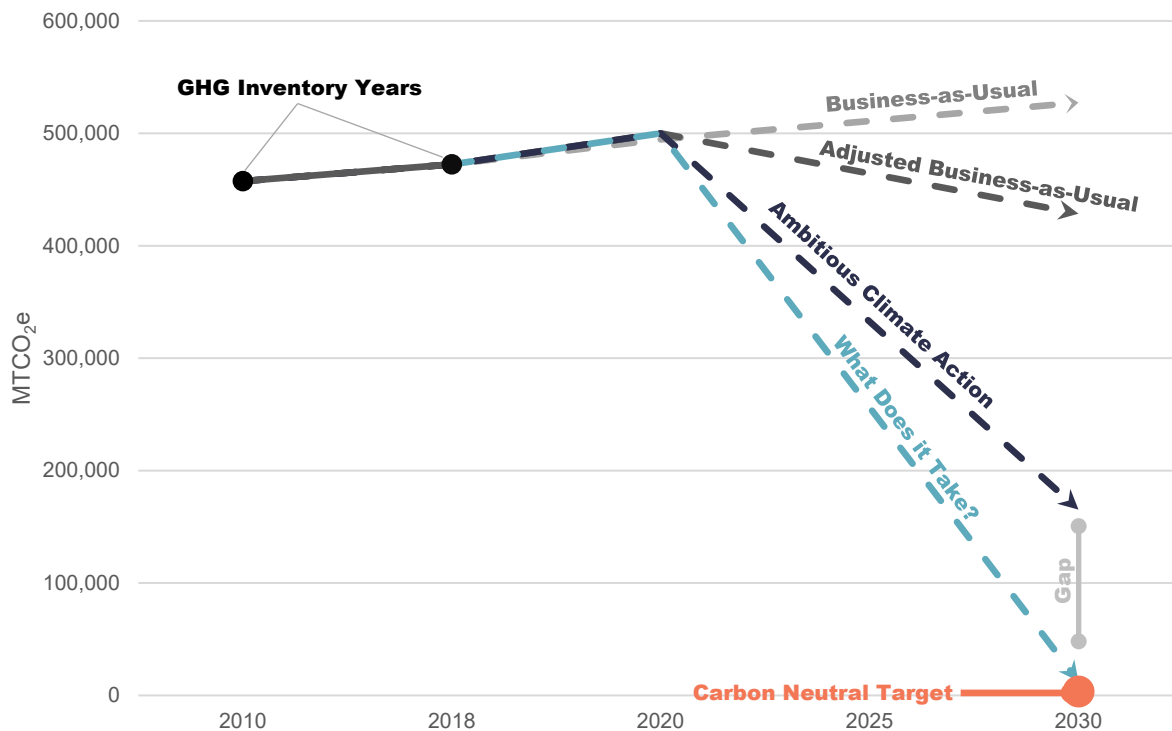
The City's goal is to work towards carbon neutrality by 2030; with this, the City is pursuing the "What does it take?" scenario, the light blue line in Figure 15 above. Though the "Ambitious Climate Action" scenario is more feasible given the City's existing staffing and resources, State climate policies and technology are changing rapidly and being implemented more quickly than imagined. The City is committed to working towards carbon neutrality and will leverage new opportunities to reach even deeper reductions. The Blueprint sets up the monitoring and reporting frameworks to make adjustments and take corrective actions to meet that target.

Cornerstone Actions

The City has identified 33 cornerstone actions to jumpstart emissions reductions within the City. These strategies align with Council priorities, generate significant emissions reductions and co-benefits, and are foundational actions that prepare the city for the implementation of additional actions in the future. **Table 4** organizes the actions under statements of intent and defines the proposed timeline and Blueprint strategy alignment. The Blueprint strategies are detailed later in the chapter.

Table 4. Cornerstone Actions by Year and Page Number

The dates indicated throughout this Blueprint refer to the year that programs should be implemented by. When a measure says "by 2026" it means that the action will be implemented as written by January 1, 2026.

Cornerstone Action	Proposed Timeframe	Blueprint Strategy Alignment	Page
In partnership with the County, stakeholder groups, utilities, and other partners, proactively distribute resources so that Petaluma residents, businesses, and contractors can access climate information and solutions. This may include events, e.g. Cool Petaluma resource fair, pop-up shopfronts, the library, and/or through a dedicated space on the City's website.	Ongoing	Across multiple strategies	
NB-1: Track pending State standards. Utilize the City's existing cross-departmental task force to track pending State standards consistent with goal of carbon neutrality, including Marin's low-embodied carbon concrete code, CALGreen embodied carbon standards, NEC Article 750 and item 220.70, AB48, pending State law banning irrigation of non-functional lawns, and others.	Ongoing	New Buildings Strategy (NB)	65
SWD-2: Food waste and special event permitting. Update the special event permitting process to include zero waste requirements for events, such as requiring applicants to submit a "waste reduction plan" for each event.	Ongoing	Solid Waste Diversion Strategy (SWD)	91
CLM-1: City Integrated Pest Management Plan. Update the Integrated Pest Management Plan to eliminate the use of toxic and polluting herbicides, pesticides, and fertilizers on City-owned property.	By 2025	City Landscape Management Strategy (CLM)	108
OSS-1: Climate Team budget and staffing strategy. Implement a budget and staffing strategy to drive climate action implementation and accountability across all City departments and on the Climate Team.	By 2026	Organization Structure and Staffing Strategy (OSS)	49

CE-1: Barriers to renewable energy use. Partner with Sonoma Clean Power (SCP) and Pacific Gas & Electric (PG&E) to identify barriers for large users and/or sectors to participate at the 100% renewable tier and develop and conduct a robust awareness and education campaign to boost enrollment. Target 100% participation in EverGreen or similar 100% renewable energy tier.	By 2026	Clean Energy Strategy (CE)	62
TDM-1: Transportation Demand Management Policy. Revise the TDM policy for employers that requires employers to submit an emission reduction plan to the City to meet the City's greenhouse gas reduction target.	By 2026	Transportation Demand Management Strategy (TDM)	76
AT-1: Active transportation and complete street improvements. Establish complete streets policy and incorporate complete streets improvements into all roadway and development projects to reduce vehicle miles traveled through implementation of the following plans and initiatives. Focus plan implementation in disadvantaged communities and those with poor access to active transportation corridors.	By 2026	Active Transportation and Complete Streets Strategy (AT)	80
SWD-2: Food recovery program. Partner with Recology and Zero Waste Sonoma JPA to implement and enforce an edible food recovery program for commercial food uses, farmers market vendors, and events.	By 2026	Solid Waste Diversion Strategy (SWD)	91
SWD-3: Zero Waste Sonoma model disposable foodware ordinance. Adopt the Zero Waste Sonoma model disposable foodware ordinance as amended by Sebastopol and Santa Rosa.	By 2026	Solid Waste Diversion Strategy (SWD)	91
GS-1: Climate awareness and action program. Implement a robust, ongoing climate awareness and action program, focused on reduction of direct and indirect emissions, including consumption-based emissions, by residents, businesses, and contractors through educational events, media outreach, and other creative approaches	By 2026	Goods and Services Strategy	98
UF-1: Petaluma Urban Forestry Management Plan. Develop and adopt a Petaluma Urban Forest Management Plan in partnership with community organizations.	By 2026	Urban Forestry Strategy (UF)	101

OSM-1. Local and regional sequestration projects. Develop a policy that prioritizes local and regional carbon sequestration partnerships, projects, and sources in the city.	By 2026	Open Space Management Strategy (OSM)	104
OSM-2: Carbon gardening campaign. Create or support the creation of a carbon gardening campaign in school yards, community centers, resilience hubs, and neighborhoods that is widely engaging and highlights its multiple benefits: sequestration, consumption, food, biodiversity, water, health, cost savings, economic recovery and growth, resiliency, and climate justice and equity.	By 2026	Open Space Management Strategy (OSM)	104
OSM-3. Integrated Pest Management Plan for HOAs and the public. Require new development to create an Integrated Pest Management Plan and provide templates for HOAs and the public.	By 2026	Open Space Management Strategy (OSM)	104
CLM-2: Comprehensive Land Management Plan. Adopt a comprehensive Land Management Plan and maintenance procedures for City properties that prioritize regenerative practices.	By 2026	City Landscape Management Strategy (CLM)	108
CLM-3: Natural systems policy. Develop a natural systems policy that prioritizes nature-based systems and natural systems in capital improvements, planning, and programs.	By 2026	City Landscape Management Strategy (CLM)	108
CST-1: Education and training program for City staff. Develop and implement an ongoing education program for new and continuing employees about the City's GHG reduction and climate adaptation programs, and explicitly integrate climate positive action into the City's mission.	By 2026	City Staff Training Strategy (CST)	51
MR-1: Greenhouse gas emissions and Blueprint monitoring. Monitor the progress of the Blueprint implementation and take corrective actions to ensure programs are advancing and the City is on track to achieve the carbon neutrality targets for communitywide and municipal operations emissions.	By 2026	Monitoring and Reporting Strategy (MR)	52
MR-2: Cost/benefit and funding sources. Post adoption, estimate the order of magnitude cost of Blueprint implementation. Establish the protocol to determine the cost/benefit estimation process for Blueprint implementation. Identify gaps in funding sources to complement the City's annual budget process and engage	By 2026	Monitoring and Reporting Strategy (MR)	52

stakeholders in identifying and pursuing funding opportunities.			
FEEE-1: Aligning decarbonization goal and capital improvement plan. Align the City's Capital Improvement Plan with the facility decarbonization goal of 15% annual average replacement of gas-fueled equipment (100% by 2030).	By 2026	Facility Energy Efficiency and Electrification Strategy (FEEE)	55
OSS-2: Blueprint Coordinators. Establish departmental Blueprint Coordinators throughout the City to collect data, lead educational activities, coordinate updated annual workplans, participate in established City Leadership activities, and incentivize actions consistent with the Blueprint vision.	By 2027	Organization Structure and Staffing Strategy (OSS)	49
TLUC-1: General Plan Update. Adopt the updated General Plan that defines transit-oriented communities, complete 15-minute neighborhoods, and incremental infill within the City's existing residential neighborhoods.	By 2027	Transportation and Land Use Coordination Strategy (TLUC)	73
TLUC-2: Zoning Code revision. Adopt a revised Zoning Code based on the updated General Plan.	By 2027	Transportation and Land Use Coordination Strategy (TLUC)	73
PM-1. Parking management policy. Establish a parking management policy to balance supply and demand, to reduce demand for parking, and to meet target utilization rates at key destinations through the use of dynamic pricing.	By 2027	Parking Management Strategy	78
VEEM-1: Electric vehicle charging infrastructure strategy. Develop an EV charging infrastructure strategy focusing on workplaces, schools, and multi-unit dwellings aligned with utility and State provided incentives and focused initially on disadvantaged populations and neighborhood hubs.	By 2027	Vehicle Electrification and Electric Mobility Strategy (VEEM)	84
OSM-4: Natural Open Space Management framework. By 2027, develop and adopt an Natural Open Space Management framework as part of a comprehensive update to the Petaluma River Plan with policies to enhance wildlife corridors and increase carbon sequestration, biodiversity, and public access for different typologies of natural open space.	By 2027	Open Space Management Strategy (OSM)	104
FEEE-2: City asset and facilities management. Accelerate the City's own actions to achieve carbon	By 2028	Facility Energy Efficiency and	55

neutrality through asset and facilities management, including facility audits and electrification		Electrification Strategy (FEEE)	
CE-2: Gas-powered lawn and garden equipment phase out. Ban gas-powered lawn and garden equipment in the city and establish a program allowing electric equipment to be charged throughout the day as it is used with a phase out strategy that is in alignment with state and regional goals and programs to ensure that the transition considers equity impacts.	By 2028	Clean Energy Strategy (CE)	62
EBEE-1: Electrification and Efficiency Strategy. Develop a phased-in Existing Building Efficiency and Electrification strategy to retrofit 85% of existing homes and businesses to all-electric by 2030.	By 2028	Existing Building Electrification and Efficiency Strategy (EBEE)	67
ZEVFB-1: Electrification of transit fleet. Accelerate the City's own actions to achieve carbon neutrality through electrification of the transit fleet.	By 2030	ZEV Fleet and Bus Strategy (ZEVFB)	57
TS-1: Petaluma transit service. Expand and improve Petaluma Transit and shared mobility services to be more accessible, affordable, and timely.	By 2030	Transit Service Strategy (TS)	82
W-1: Resilient water supply. Create a resilient water supply by increasing conservation, utilizing and expanding existing incentive programs to include direct-install, implementing a tiered rate structure, and exploring greywater requirements as part of building code for all new construction and major renovations of existing buildings.	By 2030	Water Strategy (W)	87

Action Plan Table Key

GHG Reduction Potential:
Supportive – no direct emissions reductions but aid the implementation of measures with direct emissions reductions.
Low – less than 15,000 MTCO2e
Medium – 16,000 – 40,000 MTCO2e
High – more than 40,000 MTCO2e

Responsible City Departments: The City department or entity that will lead the implementation.

Cost Key:
$ - Low Cost (e.g., municipal code updates, plan updates, changes to internal protocols or existing programs)
$$ - Medium (e.g., new plans and studies and innovative programs)
$$$ - High (e.g., capital projects)

Carbon Neutral Municipal Operations Plan

The ability to meet Petaluma's aggressive GHG mitigation goal and adapt to the effects of climate change will be demonstrated by City efforts to achieve high-performing buildings and facilities, sustainable transportation, and more. To meet the City's ambitious goal, the City will align department resources and staffing; define organizational structure, communications, and collaborative work plans; and manage facilities and assets to achieve carbon neutrality.

The City will implement a series of actions that will both reduce carbon emissions from municipal operations and enhance resiliency. These actions include energy and water efficiency upgrades for City facilities, parks, and landscapes, sustainable new construction, the electrification of buildings and fleet vehicles, supporting electric vehicle adoption through charger installation, and the installation of resilience measures including solar plus storage projects. These actions will not only reduce emissions but create community benefits through continuity of operations through emergencies and leading by example.

This will require the City to commit consistent, sustainable funding for new staff resources, training, and report and monitoring, among others.

The chapter consists of two sections. The Carbon Neutral Management Action Plan includes strategies for:

- City Staffing
- City Staff Training
- Reporting and Monitoring

The Carbon Neutral Facilities and Assets sections includes strategies for:

- Facility Energy Efficiency and Electrification
- ZEV Fleet and Bus Action Plan
- City Staff Transportation Demand Management

Carbon Neutral Management Action Plan

Organization Structure and Staffing Strategy

Intent: To meet the City's ambitious communitywide and municipal operations carbon neutrality goal by 2030, the City will align department resources and staffing; define organizational structure, communications, and collaborative work plans; and manage facilities and assets to achieve carbon neutrality. Staff culture is permeated with a climate sensibility.

The Blueprint is an ambitious plan with a compressed timeline that requires a high-level of interdepartmental coordination, communication, and decision making. The Organizational Structure and Staffing Strategy aims to establish an initial framework to implement the Blueprint actions, recognizing the framework must be flexible to adapt over the next decade and beyond. Each department will assign a Blueprint Coordinator to support the implementation of the Blueprint measures assigned to their department, educate their coworkers about GHG reduction measures in the workplace, and coordinate/report to the Climate Team.

This framework includes establishing a centralized team, headed by the Climate Action Manager, with duties including but not limited to:

- Overseeing Blueprint implementation
- Develop staff trainings and educational material
- Coordinating inter-departmental communication
- Managing relationships with external stakeholders
- Identifying and pursuing sources of funding to implement the Blueprint
- Annual reporting

The process of developing the Blueprint has identified the need for technical expertise amongst staff to manage certain tasks within existing departments was identified. This expertise includes fleet management in Public Works to support the electrification of the City fleet, and Green Building expertise in the Building Department to help create and enforce new requirements. Ensuring that the City has access to technical expertise is scheduled for the first three years of the Blueprint implementation so that teams and staff can efficiently implement these new programs.

Equity Considerations

The Climate Team can ensure that all the Blueprint implementation actions and programs adhere to equity principles. It will be more efficient for the Climate Team to manage this instead of each department separately. Climate Team staff will be able to consider equity a part of the overall Blueprint implementation effort, rather than in a piecemeal way with each separate program.

Internally, establishing the group of Sustainability Coordinators presents an opportunity for non-management staff to develop leadership skills.

Performance and Equity Metrics

- Number of Blueprint Coordinators (at least one per department)
- Number of coordination meetings

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$$		City Manager, Public Works, Building, Human Resources

Cornerstone Actions

- **OSS-1: Climate Team staffing strategy.** By 2026, implement a staffing strategy to drive climate action implementation and accountability across all City departments and on the Climate Team. This may include a director level position, manager, and/or sector-specific positions, including a fleet manager, a green building official, a transportation coordinator,[25] or similar.

- **OSS-2: Climate Team and Blueprint Coordinators.** By 2027, establish a Climate Team with departmental Blueprint Coordinators to collect data, lead educational activities, coordinate updated annual workplans, participate in established City Leadership activities, and incentivize actions consistent with the Blueprint vision.

  a. Establish quarterly Climate Team meeting milestones and annual reporting requirements for the Blueprint Coordinators to report to the Climate Team. By 2026, Climate Team will begin conducting quarterly meetings with the departmental Blueprint Coordinators.

  b. Require every City department to assign a Blueprint Coordinator. Representation could be flexible based on departments, with a commitment for the average number of annual hours for the Climate Team from each Blueprint Coordinator. Duties shall include but are not limited to:

     i. Participate in a quarterly working group that leads education activities and guides implementation of Blueprint policies within and across departments. Management Analysts may be key in this process based on existing work programs.

     ii. Act as their department's TDM ambassador by leading activities and educating coworkers on the TDM policies and benefits.

  c. At the end of each calendar year, convene a meeting with the Climate Team, department heads, and departmental CAP Coordinators to discuss the upcoming year's priorities for Blueprint implementation. Decide on course corrections and updated workplans based on the progress achieved (or lack thereof) towards the City's carbon neutrality target.

  d. Establish procedures and standardized templates for all departments to keep records of data relevant for tracking Blueprint measure GHG reductions, including but not limited to municipal fleet fuel records, building permit data, airport activity and fuel sales, and community engagement details (i.e., number of events, participants, and adherence to zero waste and local food policies). Develop procedures for departments to respond to Climate Team data requests and to provide data for the online Dashboard.

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[25] See Monitoring and Reporting Strategy.

Additional Implementation Actions
• **OSS-3: Annually evaluation of staffing needs.** By 2027, annually re-evaluate the staffing needs for Blueprint implementation. Determine if additional staff capacity is needed and/or if the duties of the Climate Team and departmental Sustainability Coordinators need to be adjusted. • **OSS-4: Climate data collection.** Partner with the Regional Climate Protection Authority to collect data (key performance indicators, success stories, etc.) to provide to the Climate Team for the Blueprint annual report.

City Staff Training Strategy

Intent: The City develops and implements a training program for new and continuing employees about the Blueprint and City's GHG reduction program to ensure City staff receive the appropriate training on climate action to foster a culture of sustainability, help staff understand their role and outline short-term workplan through effective Green Human Resources Management (GHRM) practices.

The City's employees are a valuable resource in making the City's practices more sustainable. When employees understand the many ways in which the City can advance sustainability, they can consider how their own work fits into the bigger picture. Employees who understand the urgency of climate change and the severity of the inequities of climate impacts will be motivated to develop and implement sustainable solutions in both their professional and personal lives. Climate should be part of everyone's job and be woven into the City's staff culture. Employee training and continuing education will help to ensure that all employees implement the City's municipal and workplace sustainability policies.

To achieve Petaluma's ambitious climate action goals, all City employees will need to play a role and become climate action champions.

Equity Considerations

Trainings about climate action and City policies are an opportunity to engage staff in conversations about the intersection of equity and climate.

Performance and Equity Metrics

- Number of staff attending climate action trainings
- Change in staff perception and learning survey results

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$		Climate Team, All Departments
Cornerstone Actions			
• **CST-1: Education and training program for City staff.** By 2026, develop and implement an ongoing education program for new and continuing employees about the City's GHG reduction and climate adaptation programs, and explicitly integrate climate positive action into the City's			

mission. Require training on the City's Blueprint policies and programs for new employee orientation and require the training every two-years for all current employees.

    a. Develop and conduct pre- and post-training Perception and Learning surveys to track learning outcomes and provide feedback for subsequent trainings.

    b. Update the employee training yearly as new policies are enacted.

Additional Implementation Actions

- **CST-2: Educational materials for City staff.** By 2026, create and distribute educational materials to staff related to climate change initiatives. Draw from existing online educational materials for general topics and create new materials about specific City policies and programs as they are enacted through 2030. Develop materials on:
  - a. How and why to reduce energy use at work;
  - b. The benefits of electric appliances over gas;
  - c. How to implement the Local Food Procurement Policy at City events and other functions;
  - d. The City ZEV fleet vehicle policies, how to use ZEVs, and their environmental benefits;
  - e. The rules and available benefits/incentives of City employee TDM program;[26]
  - f. Departmental data collection procedures;[27]
  - g. Climate change and equity; and/or
  - h. Other topics as defined by the Climate Team.
- **CST-3: Training on Battery Electric Bus (BEB) operation.** By 2026, conduct training on Battery Electric Bus (BEB) operation for Petaluma Transit bus drivers.
- **CST-4: Training on Building and Clean Energy requirements.** By 2026, in partnership with the Building Department staff develop and administer trainings to permit counter staff on new Building and Clean Energy requirements.[28]

Monitoring and Reporting Strategy

Intent: The City measures Blueprint implementation progress and provides transparency and information to enhance accountability. The proposed revised actions lift up actions included within the Blueprint and allow for course-correction based on progress.

To achieve the Blueprint's ambitious GHG reduction targets by 2030, it is crucial for the City to keep track of implementation progress with clear metrics on progress and trends. Targets are defined as the level of performance to measure goals and strategy implementation. The key performance indicators are the specific data used to measure progress.

A first step is to expand existing emissions monitoring and data collection procedures so individual departments can contribute to the Climate Team's overall Blueprint monitoring. Results will then be analyzed internally to ensure progress is being made, or to course correct if certain sectors or measures are not progressing as expected. The results will also be showcased for the public on an online dashboard. The dashboard is intended to be a living tool that is regularly updated to show progress on

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[26] See the Transportation and Land Use Action Plans.
[27] See Monitoring and Reporting Strategy.
[28] See Building Action Plans and Clean Energy Action Plans, respectively.

key performance indicators, illustrate historical progress over the years, and highlight current initiatives. The City is already communicating with regional partners about creating a regional tracking system of key climate metrics.

If there is a problem with Blueprint implementation, the City will take corrective action to improve performance and/or prevent the reoccurrence of an issue. Corrective adjustments will be aimed at: 1) resolving the immediate issue, 2) considering whether similar issues might exist or arise elsewhere in the City, and 3) taking action, if needed, to prevent similar problems from occurring. Actions that implement system changes will be documented and monitored to evaluate effectiveness.

Equity Considerations

With effective monitoring, the City can understand how effectively programs are being delivered to priority populations. Additionally, transparent reporting of Blueprint implementation progress advances procedural equity by allowing all Petalumans to access information.

Performance and Equity Metrics

- Greenhouse gas emissions
- Dollars spent on fossil fuels per year
- Employees using public transit v. single occupancy vehicle (SOV)
- Percentage of zero emission vehicles (ZEV) in City Fleet

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$		Climate Team

Cornerstone Actions

- **MR-1: Greenhouse gas emissions and Blueprint monitoring.** Monitor the progress of the Blueprint implementation and take corrective actions to ensure programs are advancing and the City is on track to achieve the carbon neutrality targets for communitywide and municipal operations emissions.
    a. By 2026, establish an annual GHG emissions budget that encompasses all City-run and City-controlled activities, including building and infrastructure construction, repair, and maintenance – City ops and all issued building permits.
    b. By 2026, establish procedures and templates for all departments to keep records of data relevant for tracking Blueprint measure GHG reductions.
    c. By 2026, develop a Dashboard on the City website for the public to view annual Blueprint implementation progress on all City-run and City-controlled activities, and community-wide activities. Use dashboard as the Blueprint annual report. Publish online and present to CAC. Prepare an annual update through 2030.
    d. By 2027, estimate Petaluma's consumption and jurisdictional emissions. Re-estimate emissions at three-year intervals.
- **MR-2: Cost/benefit and funding sources.** By 2026, post adoption, establish the protocol to determine the cost/benefit estimation process, estimate the order of magnitude cost of Blueprint implementation in conjunction, identify gaps in funding sources to complement the

	City's annual budget process, and engage stakeholders in identifying and pursuing funding opportunities.
Additional Implementation Actions	

- **MR-3: Internal progress tracking.** By 2026, develop an internal site on City intranet to track progress on all community and municipal mitigation, adaptation, equity and engagement activities and actions. Site may be administered by the Climate Action Manager and incorporate the data from departmental sustainability coordinator's annual reporting. This data will be used to develop community-facing Blueprint progress reports.
  a. By 2026, develop a policy to prevent the misuse of offsets to meet the City's carbon neutrality target.

Carbon Neutral Asset and Facilities Management Action Plan

Facility Energy Efficiency and Electrification Strategy

Intent: The City demonstrates leadership in meeting the Carbon Neutrality goal by 2030 by accelerating municipal actions to reduce energy consumed, and to upgrade all municipal facilities with all-electric appliances and systems.

Increasing energy efficiency is an important effort to complement building decarbonization (see Municipal Facility Electrification Strategy). It is a critical first step to understand existing electrical loads, and for identifying loads that currently use fossil fuels which need to be electrified.

Energy efficiency can reduce the cost of electrification and reduce the amount of resources required. This is important because demand for electricity will increase as the City decarbonizes its facilities and as decarbonization occurs on the community scale.

To become all-electric, City facilities must replace gas appliances, such as HVAC systems and water heaters. Electrifying City facilities will demonstrate leadership to the community since private buildings will also be required to decarbonize buildings eventually per the existing building electrification strategy.

Though this action plan calls for decarbonization of City facilities, there may still need to be gas appliances where technology is not developed or cost effective yet, or if there are concerns about reliability for certain critical infrastructure. For instance, all the City's emergency generators for fire stations, water treatment and stormwater infrastructure, and other critical departments are currently powered by fossil fuels. In this case, it is more sustainable from a consumption emissions standpoint to continue using existing infrastructure through the end of their useful life, and purchasing clean alternatives, if possible, at the time of replacement.

Equity Considerations

Improving the operations of facilities means they can better serve all Petalumans. Though there are upfront costs to make energy efficiency upgrades, they can save money in the long-term that can be poured back into the community. Likewise, natural gas appliances contribute to indoor and outdoor air pollution. Electrification will improve air quality for the employees and visitors to City buildings, as well as the surrounding communities.

Performance and Equity Metrics[29]

- Reduction in Municipal natural gas use/appliances/equipment powered by fossil fuels
- Municipal electricity use
- Reduction in Municipal energy related emissions
- Amount of solar PV installed at City facilities
- Battery storage capacity installed at City facilities

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[29] Metrics about City managed landscapes are located in the City Landscape Management Action Plan.

- Amount of downtime/power outage experienced at City facilities
- Number of existing facilities retrofitted to be all-electric, including those in disadvantaged communities
- All new facilities being all-electric
- Number of interpretive displays installed in public-facing building areas

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
High	$$	Resilience, air quality, public health	Public Works

Cornerstone Actions
- **FEEE-1: Aligning decarbonization goal and capital improvement plan.** By 2026, align the City's Capital Improvement Plan with the facility decarbonization goal of 15% annual average replacement of gas-fueled equipment (100% by 2030).
- **FEEE-2: City asset and facilities management.** Accelerate the City's own actions to achieve carbon neutrality through asset and facilities management, including:
  a. Facility audits and electrification
     i. By 2026, perform an inventory of natural gas-fueled equipment and electrical load capacity at municipal facilities.
     ii. By 2026, conduct investment-grade energy audits of City facilities and lighting to identify and prioritize energy upgrade (e.g., decarbonization, resilient energy, and energy efficiency) opportunities in existing facilities and incorporate into CIP. Facilities with the highest energy consumption are already identified in the 2019 Municipal Inventory.
     iii. By 2026, conduct energy benchmarking using Energy Star Portfolio Manager and adopt Energy Use Intensity targets, or other metrics as appropriate, for existing facilities.
     iv. By 2026, using data from Energy Star Portfolio Manager to pilot an energy monitoring and management dashboard for the Public Works and Utilities Department to track the impacts of energy upgrades, and report this information to staff, leadership, and the community.
     v. By 2027, prepare a municipal building and facility efficiency and electrification plan with identified sources of funding for inclusion in the City budget and completion by 2030.
     vi. By 2030, convert all City-owned maintenance equipment to all electric and battery operated as feasible. Where feasible, retrofit all City facilities, parking lots, and garages to be equipped with solar arrays or canopies.

Additional Implementation Actions
- **FEEE-3: Purchasing policies for City facilities.**
  a. By 2025, update purchasing policies to prioritize the purchase of electric equipment for buildings. Include language to comply with State restrictions on the purchase of gas-powered lawn and garden equipment by 2025 and portable generators by 2028.

> b. By 2026, update Facilities and Purchasing language to require vendors for City facilities projects meet energy efficiency requirements such as LEED, Envision, Living Building Challenge etc. Consider developing a template, rubric, and/or requiring the use of a calculator for vendors to estimate energy efficiency.
> - **FEEE-4: Gas-powered lawn and garden equipment for City operations.** By 2026, establish a policy to phase out the use of gas-powered lawn and garden equipment for City operations based on evolving technology.
> - **FEEE-5: City building standards for new municipal buildings.** By 2026, adopt building standards for new municipal buildings that require all electric construction and encourage the installation of energy efficient designs, renewable energy systems, battery storage, passive solar design, and other innovative technology.
> - **FEEE-6: New backup power systems at City facilities.** By 2026, require new backup power systems at City facilities to be powered using carbon-free energy sources such as (lithium-ion batteries or solar) where feasible.
>   > a. Explore utilizing EV fleet bidirectional charging for back-up power where feasible.
>
> **Examples of Funding Opportunities**
> - BayREN
> - PG&E SGIP
> - PG&E On-bill financing
> - CEC Energy Conservation Assistance Act – Low-Interest Loans
> - CalOES

ZEV Fleet and Bus Strategy

Intent: The City demonstrates leadership in meeting the Carbon Neutrality goal by 2030 by accelerating municipal actions to transition the Petaluma vehicle fleet to 100% ZEV by 2030.

The 2019 Municipal GHG Inventory revealed that 31% of the City's operational emissions are produced by the vehicle fleet. Currently, there are ZEV options available for light-, medium-, and some heavy-duty vehicles. Fleet managers must create a procurement and vehicle retirement schedule based on existing technology but also be prepared to re-evaluate as the market develops.

Proposed public fleet requirements of the CARB Advanced Clean Fleets Regulation[30] state that starting January 1, 2024, 50% of the vehicles added to the fleet each calendar year must be ZEV. Starting January 1, 2027, 100% of vehicles added must be ZEV each calendar year. There are some exceptions for emergency vehicles, military tactical vehicles, two-engine vehicles, etc. The City Transit fleet is required to be fully zero-emission by 2040 at the latest per the Innovative Clean Transit Regulation. The City must accelerate these targets in order to achieve 100% ZEV fleet by 2030.

Petaluma Transit already has a study and plan from 2019 to convert the bus fleet to electric, develop charging infrastructure, and increase electrical capacity. Currently, all Petaluma Transit vehicles are

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[30] CARB. (2022). Advanced Clean Fleets Regulation Proposed Draft Regulation Language. https://ww2.arb.ca.gov/sites/default/files/2022-04/220504acfdraftstatelocal_ADA.pdf

identified to be replaced with zero emission vehicles by approximately 2035. Advancing this transition to occur by 2030 will require additional funding and resources. The Petaluma Transit yard (555. N. McDowell Blvd) also requires significant infrastructure upgrades and the installation of multiple high-capacity chargers to accommodate a battery-electric fleet.

The following strategy includes actions for the City fleet (which will be managed by a Fleet Manager)[31] and the buses (which are under the jurisdiction of Petaluma Transit) to become fully zero-emission.

Equity Considerations

Disadvantaged communities face higher burdens of environmental pollution. Transitioning the City fleet to ZEVs will reduce the NO_x, PM 2.5, and other pollutants released into communities. Better air quality improves the quality of life for all Petalumans but is especially important in DACs which frequently have higher rates of chronic respiratory disease.

Performance and Equity Metrics

- Annual emissions from City fleet vehicles
- Annual emissions from the Petaluma Transit bus fleet
- Number of combustion vehicles replaced with a ZEV alternative in City vehicle fleet
- Number of combustion vehicles replaced with a ZEV alternative in Petaluma Transit fleet
- Number of EV charging stations by type installed for City fleet charging
- Number of EV charging stations by type installed for Petaluma Transit fleet charging
- Number of "comfort" upgrades to improve user experience and passenger appeal of transit fleet.

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$$$	Resilience, air quality	Climate Action Manager, Fleet Manager, Petaluma Transit

Cornerstone Actions

- **ZEVFB-1: Electrification of transit fleet.** Accelerate the City's own actions to achieve carbon neutrality through electrification of the transit fleet, including:
  a. By 2026, infrastructure upgrades to the Corporation Yard and Petaluma Transit.
      i. Partner with PG&E to assess and upgrade electrical infrastructure at the Corp Yard.
      ii. By 2026, complete infrastructure upgrades to the Petaluma Transit yard to be able to charge the first wave of electric buses as recommended by the Battery Electric Bus Planning and Engineering Study for Petaluma Transit (2019). Partner with PG&E to assess and upgrade electrical infrastructure at the Corp Yard.
          1. Implement the City's EV Charging Master Plan related to the installation of charging infrastructure at the City Corp Yard and other facilities where fleet vehicles are housed.

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[31] See Organization Structure and Staffing Strategy.

iii. By 2028, complete all infrastructure needs to accommodate an electric bus fleet as recommended by the Battery Electric Bus Planning and Engineering Study for Petaluma Transit (2019).

b. By 2030, electrification of transit fleet.

i. (Ongoing) Continue implementing the Petaluma Transit policy that all new bus procurements are ZEB.

ii. Conduct bus driver training on operating the ZEV buses.

iii. Create community outreach and education materials on the benefits of ZEV buses.

Additional Implementation Actions

- **ZEVFB-2: EV motor pool.** (Ongoing) Continue to expand and promote an EV motor pool, including electric bicycles, for employees to conduct City business.
- **ZEVFB-3: Public charging projects.** (Ongoing) Continue to include charging infrastructure projects in the Capital Improvement Plan and funds for ZEV fleet vehicles in the budget.
  a. By 2027, expand EV charging to 10% of spaces in municipally-owned structures and lots. By 2030, expand EV charging to 25% of spaces.
  b. Continuously evaluate innovations in ZEV charging infrastructure such as smart charging, bi-directional charging and portable solar plus battery chargers.
- **ZEVFB-4: On-demand microtransit service study.** By 2025, conduct a feasibility study for enabling and implementing on-demand microtransit service as part of Petaluma Transit.
- **ZEVFB-5: Fleet transition plan**. By 2025, create a fleet transition plan that amends the fleet vehicle procurement policy to require that all new light-duty fleet vehicle purchases are ZEV. Require that all new medium-duty fleet vehicles deemed feasible by the fleet manager are ZEV.
  a. Select sites to develop EV charging infrastructure (and/or hydrogen fuel cell if applicable) for fleet vehicles.
  b. Create a phased-in approach to remove light- and medium-duty combustion vehicles from the fleet and replace with ZEV.
  c. Work closely with the Fire, Police, and Water departments in the development of the plan to understand opportunities and challenges of converting emergency services and utility vehicles to ZEV.
  d. Identify opportunities to reduce the number of fleet vehicles in favor of shared vehicles and electric bicycles.
  e. Develop a tool to track the costs and benefits of new ZEV purchases and fleet conversion. Records must be kept to prepare compliance reports for CARB Advanced Clean Fleets regulations and will assist in the preparation of future municipal GHG inventories.
  f. By 2027, re-evaluate feasibility of converting heavy-duty vehicles to ZEV and update the Plan
- **ZEVFB-6: Solar/backup generator system at the Petaluma Transit Yard**. Install solar panels and a zero-emission energy backup/generator system at the Petaluma Transit Yard.

Examples of Funding Opportunities

- CALeVIP
- HVIP
- Federal Bipartisan Infrastructure Legislation (2022)

- PG&E EV Fleet Program
- Monitor CARB for new grant funding in support of Advanced Clean Fleets requirements
- Volkswagen Environmental Mitigation Trust Zero-Emission Transit, School, and Shuttle Buses
- Carl Moyer Funds
- FTA 5307 and 5339 (Low or No Emission Vehicle Program) grant funds
- Low Carbon Transit Operations Program (LCTOP)
- Transit Intercity Rail Capital Program (TIRCP)
- Sonoma County Transportation Authority (SCTA) Go Sonoma funds
- Traffic Impact Fees

Employee Transportation Demand Management Strategy

Intent: City of Petaluma employees use transit and active transportation instead of single-occupancy vehicle trips to travel to work

The 2019 Municipal GHG Inventory found that employee commute comprises 27% of the emissions from City operations. A majority of employees drive alone to work in a vehicle that uses fossil fuel. Starting in 2020, commute patterns radically changed during the COVID-19 stay-at-home orders and subsequent stages of the pandemic. While the lasting effect of the pandemic on commutes remains to be seen, the City can encourage employees to take transit or active transportation for the times they do travel to the office. The City can implement incentives and disincentives as part of a comprehensive employee Transportation Demand Management (TDM) program, similar to the strategy outlined in the Transportation and Land Use Action for the community.

Equity Considerations

Disadvantaged communities face higher burdens of environmental pollution. Even the relatively small reduction in vehicle miles traveled from City employees will help reduce the NOx, PM 2.5, and other pollutants released into communities. Better air quality improves the quality of life for all Petalumans but is especially important in disadvantaged communities which frequently have higher rates of chronic respiratory disease.

Performance and Equity Measures

- Change in SOV commute trips
- Reduction in VMT from employee commuting
- Number of active transportation improvements made at City workplaces
- Number of employees participating in incentive programs

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$	Resilience, air quality, health	Climate Action Manager, Human Resources
Implementation Actions			
• **ETDM 1: City employee Transportation Demand Management Program**.			

a. By 2026, conduct an employee survey that reflects post-COVID-19 lockdown commute patterns and work-from-home policies. Assess feasibility of implementing the County's Clean Commute program. Conduct regular follow-up surveys to track ongoing progress.
b. By 2026, finalize and adopt the City's work-from-home policy to allow employees to work from home a set number of days per week, as position-appropriate.
c. By 2026, establish a TDM coordination framework and prepare a plan to reduce employee single-occupancy vehicle trips that may include:
    i. Implementing a transit pass reimbursement program beyond the existing free Petaluma Transit rides for City employees.
    ii. Reducing or eliminating free employee parking at City facilities or establishing a parking cash-out program.
    iii. Implementing a carpool incentive and carpool group matching program.
    iv. Building biking and walking infrastructure at City facilities such as secure bike racks, bike lockers, bike repair stands, electric bike hubs and showers.
    v. A policy prioritizing transit for work-related travel.
    vi. Consider developing workforce housing for City employees to reduce commuting.
    vii. Allow for the purchase of e-bikes using City Wellness benefit.
    viii. Create an E-bike share program for City employees or subsidize employee use of citywide bike share.
d. By 2026, consider providing incentives to City employees to lease or purchase an EV. This can include a monetary incentive or providing benefits such as free charging and preferred parking.
e. By 2026, establish a data monitoring system that tracks reductions in employee SOV trips and uptake in employee incentive programs.
- **ETDM 2: City TDM activation and engagement.**
    a. (Ongoing) encourage employee participation in National Bike Month (May). The City can host events, raffles, and workshops to educate and motivate employees on the benefits of biking to work.
    b. By 2026, conduct focus groups with employees about their commutes and how to reduce SOV trips.
    c. By 2027, partner with local bike shops to create an employee bike voucher or reimbursement program.
    d. Provide all City employees with access to a free bikeshare membership when such a program is implemented throughout Petaluma.
- **ETDM 3: City employee TDM survey.** By 2026, conduct a follow-up employee commute survey and adjust programs as needed to achieve SOV trip reduction target.

Examples of Funding Opportunities
- MTC Active Transportation Program

Clean Energy Action Plan

Clean Energy Strategy

Intent: Petaluma has a resilient and fossil-free energy system that reduces energy-related greenhouse gas emissions, as well as improves local air quality and public health.

Residential and nonresidential energy use, including electricity and natural gas, account for 24% of Petaluma's greenhouse gas emissions. Now that electrical service in Petaluma is available through Sonoma Clean Power (SCP), which supplies low-carbon electricity to Petalumans, the use of natural gas for space heating, hot water and cooking accounts for almost 80% of building energy-related emissions in the city.

As of 2020, the community-wide participation rate in SCP is 89%. While all SCP energy is very low carbon, only 4% of SCP accounts in Petaluma are in the EverGreen 100% renewable energy tier. Participating in SCP has the lowest upfront cost to access clean energy. Clean grid electricity, including the installation of distributed energy resources (DERs), such as local solar projects, is a keystone effort being led by the State to achieve its climate goals and build community resilience. Senate Bill 100's renewable portfolio standard requires that supplied energy be 100% from renewable or carbon-free sources by 2045. Furthermore, the City received a $300K CalOES grant for emergency preparedness, which the City has used to prepare the Community Center for backup power that is compatible with the City's current generators and future battery energy storage installations.

Equity Considerations

The Clean Energy Action Plan proactively addresses issues related to equity by understanding the barriers to participating in clean energy programs, including SCP, and focusing resources on SB 1000 disadvantaged communities to improve accessibility. Additionally, resources could be prioritized for the installation of solar plus storage projects for medical baseline customers to ensure access to electricity during power outages as well as include developing a phase out strategy for gas lawn and garden equipment that is in alignment with state and regional goals and programs to ensure that the transition considers equity impacts.

Performance and Equity Metrics

- Participation rate in SCP CleanStart and EverGreen
- Number of (or size of) solar installations on commercial buildings
- Number of (or size of) solar installations on residential buildings
- Number of battery storage systems installed, including to support CARE/FERA customers and in DACs
- Participation rate in utility (SCP and PG&E) and State clean energy incentive programs

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$-$$	Resilience, air quality, public health	Public Works, City Manager's Office

Cornerstone Actions

- **CE-1: Barriers to renewable energy use.** By 2026, Partner with Sonoma Clean Power (SCP) and Pacific Gas & Electric (PG&E) to identify barriers for large users and/or sectors to participate at the 100% renewable tier and develop and conduct a robust awareness and education campaign to boost enrollment. Target 100% participation in EverGreen or similar 100% renewable energy tier.
- **CE-2: Gas-powered lawn and garden equipment phase out.** By 2028, ban gas-powered lawn and garden equipment in the city and establish a program allowing electric equipment to be charged throughout the day as it is used with a phase out strategy that is in alignment with state and regional goals and programs to ensure that the transition considers equity impacts.

Additional Implementation Actions

- **CE-3: Local renewable energy generation**. By 2026, continue supporting the local generation of renewable energy by:
    a. Adopt solar plus storage reach codes for residential and nonresidential development to require solar (kW/sf) for nonresidential buildings and for residential to cover the expected summer mid-day real-time energy demand of the home with PV systems. Ensure that systems are designed for the simultaneous or future installation of and connection to battery storage.
        i. Utilize existing cost-effectiveness studies developed by the California Energy Commission (CEC).
        ii. Hire a consultant to evaluate the cost effectiveness of clean energy options including SCP, rooftop solar, and community solar projects.
        iii. Conduct public hearings, public notices, and formally adopt solar reach code ordinances.
        iv. Submit the adopted ordinances to the California Energy Commission (CEC) and California Building Standards Commission (CBSC) as required to have requirements apply to the current code cycle. Re-adopt this reach code with the new building code in 2026, if the 2025 code cycle doesn't include a storage component.
    b. Conduct a community-wide renewable energy generation analysis to identify locations in the city where renewable energy generation can be installed. Assess the feasible locations and proposed equipment identified in the communitywide renewable energy generation analysis under CEQA.
        i. Explore renewable sources including solar PV, storage, bidirectional EV charging, automated demand response, and microgrids.
        ii. Expand the City's biogas production at Ellis Creek.
    c. Establish a program to offer support to affordable housing developments with the installation of on-site solar and battery storage.

d. Provide links to resources on local, Federal, and State solar credits and other financing incentives on the City website. Explore partnering with a solar consultant firm to provide guidance for property owners. Offer free post-installation roof inspections.

- **CE-4: Biogas production at Ellis Creek Water Recycling Facility.** By 2027, create a plan with scenarios to expand biogas production at Ellis Creek Water Recycling Facility, including a scenario to double the capacity of the plant.
- **CE-5: Municipal leadership and resiliency.** Continue to show leadership to ensure the City facilities and building:
    a. By 2026, adopt a policy requiring municipal back-up energy systems, including generators, be powered by carbon-free energy where appropriate for public safety. Phase out the existing systems at or before the end of their useful life.
        i. By 2030, explore the potential of expanding this requirement to residential and commercial properties.
    b. By 2027, partner with SCP to identify funding for installation of renewable energy generation at feasible locations.
    c. By 2030, consider generating 100% of municipal energy from local (within Sonoma County), carbon-free or renewable sources, exploring grid-independent energy generation and storage at critical facilities.
        i. Determine the anticipated generation capacity (kW) of planned renewable energy projects including at the Community Center, Community Sports Field, Police Department, Swim Center/Fairgrounds, and Ellis Creek Water Recycling Facility.
        ii. Determine the energy storage potential at existing City facilities.

Additional actions related to energy efficiency and conservation are included in the Buildings and Carbon Neutral Municipal Operations Action Plans.

Examples of Funding Opportunities
- SCP Electrify program and BayREN Home+ Rebates.
- Bonds or taxes.
- California Energy Commission grants.

Buildings Action Plan

New Building Strategy

Intent: Decarbonized new construction that uses low embodied carbon materials, renewable energy, and efficient design.

New construction is governed by the California Building Standards Code and the California Green Building Standards Code (CALGreen), which include requirements for sustainable construction practices in the following categories:

- Planning and design
- Energy efficiency
- Water efficiency and conservation
- Material conservation and resource efficiency
- Environmental quality

The Building Standards Code is updated every three years to reflect industry best practices and increase the sustainability of new construction. Although Petaluma has already adopted an all-electric reach code for residential and nonresidential new construction and substantial remodels, the City will reevaluate its approach to new construction decarbonization as a result of the "Berkeley Ruling" which nullified their all-electric reach code.[32] Petaluma will encourage all-electric for new construction until a new pathway can be identified.

Equity Considerations

The New Building Strategy aims to improve the sustainability of new construction while ensuring equitable access to the climate benefits associated with decarbonized buildings. This outcome requires supporting affordable housing development and providing financial incentives in disadvantaged communities. Sustainable new development will address energy resilience in housing and help improve indoor air quality and stabilize energy costs for both residential and nonresidential property owners and tenants. Additionally, promoting the use of low-carbon building materials will help develop the supply chain for specific materials, and create higher paying trades jobs, which will strengthen the regional economy.

Performance and Equity Metrics

- Number of all-electric new development units
- Number of affordable units within residential projects
- Citywide natural gas use
- Number of new development projects that exceed CALGreen energy efficiency standards
- Commercial square footage that is all-electric

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[32] The Berkeley Ruling refers to the Ninth Circuit decision in California *Restaurant Association v. City of Berkeley* which holds that Berkeley's gas ban violates the U.S. Energy Policy & Conservation Act.

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$	Resilience, air quality, public health	Community Development

Cornerstone Actions

- **NB-1: Track pending State standards.** Utilize the City's existing cross-departmental task force to track pending State standards consistent with goal of carbon neutrality, including Marin's low-embodied carbon concrete code, CALGreen embodied carbon standards, NEC Article 750 and item 220.70, AB48, pending State law banning irrigation of non-functional lawns, and others (ongoing action).

Additional Implementation Actions

- **NB-2: Electrification resources and incentives**. By 2026, connect residents, businesses, architects, and contractors to building electrification resources and incentives provided by Sonoma Clean Power, PG&E, BayREN, Sonoma County RCPA, and others.
    a. Determine the feasibility and impacts of incentives to encourage new development to exceed Title 24 energy efficiency standards and adopt feasible best practices.
    b. Coordinate with stakeholders including City staff and officials and external stakeholders to explore incentive options including financial, permitting, and process efficiencies.
    c. Partner with BayREN and Sonoma County to engage contractors to understand workforce and training needs. Provide technical resources, including hosting workforce development trainings for installers to discuss benefits and technical requirements of decarbonization and carbon-free energy sources
    d. Work with partner agencies to align building permit processes and checklists with documentation needed to apply for incentives.
- **NB-3: Electrification standards.** Prepare new construction decarbonization options including establishing building performance standards, source energy thresholds, or indoor air quality standards.
    a. By 2025, add a question to the Solar Photovoltaic Systems Submittals form for all new solar systems installed if it includes a battery storage.
    b. By 2026, require use of the CalGreen checklists, encouraging with Tier 1 and/or 2 measures, and other existing standards as part of discretionary project review.
    c. By 2026, engage with stakeholders including City staff and officials, and external stakeholders, such as local developers regarding the purpose and impact of the requirements.
    d. By 2027, adopt a reach code amendment to the 2025 Building Code to be consistent with the first in the nation regulatory approach as defined by the Bay Area Air Quality Management District (BAAQMD) for building appliances[33]. It may include ADUs,

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[33] Building Appliances (bahttps://www.baaqmd.gov/rules-and-compliance/rule-development/building-appliances?blm_aid=1275592aqmd.gov)

remodels, and tenant improvements of a certain size or dollar amount in addition to new construction in reach code requirements.

    e. By 2027, identify partnerships with local trade associations, vocational programs, and community colleges to support electrification jobs training.

- **NB-4: Material reuse.** Explore incentives and requirements for use of a minimum amount of reused and salvaged local building materials in remodels and new construction, especially forward-facing exterior applications.

    a. By 2026, coordinate with Zero Waste Sonoma and other entities to provide educational information, technical assistance and installer workforce development training for developers, architects and building owners/operators about alternative materials. Make resources available on the City website, at the City permit counters, and local and regional home improvement stores.

    b. By 2026, consider an ordinance to require a minimum for recycled/reused material content.

    c. By 2026, determine which building materials have low-embodied carbon alternatives and are appropriate for the expected types of development projects in the city. Use existing green building rating systems, including Buy Clean Marin, LEED and Living Building Challenge Red List as a resource.

    d. By 2027, prepare policy that phases in requirements for low embodied carbon materials (residential and commercial), conduct CEQA analysis as needed.

- **NB-5: Operations and construction emissions.** Explore options to monitor and eliminate emissions from new construction and building operations.

    a. By 2028, hire a consultant to calculate expected emissions related to annual building activity within the city.

    b. By 2030, adopt ordinance requiring all new construction achieve net zero energy use in construction and continuing operations.

Examples of Funding Opportunities

- Continue to leverage existing programs including SCP and Bay Area Regional Energy Network (BayREN) Home+ Rebates.
- Partner with SCP, PG&E, Bay Area Air Quality Management District (BAAQMD), the California Public Utilities Commission (CPUC), and BayREN to explore opportunities to incentivize electrification for California Alternate Rates for Energy Program (CARE), Family Electric Rate Assistance Program (FERA) customers.
- Explore financing mechanisms to fund municipal incentive programs including bonds or taxes.

Existing Building Strategy

Intent: The performance of existing buildings in Petaluma is improved and decarbonized.

Most building-related emissions are attributable to the existing building stock operations, which are much less efficient than new construction due to being built when building energy standards were less stringent or nonexistent. The three ways to reduce building related emissions are energy efficiency, sustainable construction practices, and electrification. Decarbonizing existing building operations through electrification is critical to meeting emissions reduction goals. There are many challenges associated with improving the performance of existing buildings including costs, rental/ownership status and split incentives, and technological constraints.

Equity Considerations

The Existing Building Action Plan aims to enable retrofitting of existing homes and businesses in Petaluma to achieve energy savings and more efficient operations. The implementation of energy efficiency measures has positive equity impacts because more energy efficient homes and businesses improve indoor air quality, reduce energy use, and lower energy bills. Disadvantaged residents and businesses benefit from improvements to existing buildings, particularly those with increased risks from poor indoor air quality including residents with pre-existing medical and respiratory conditions.

Improving existing buildings in Petaluma focuses on equitable decarbonization and promoting existing energy efficiency programs offered by BayREN, PG&E, and SCP. Equitable electrification achieves decarbonization of building operations, equal access to health and safety benefits, economic benefits, and maximizes the ease of installation for everyone, but focuses resources for underserved communities. The City has an existing Tenant Ordinance to mitigate displacement risk that strengthens tenant protections, including ''relocation assistance' and 'right of return' for tenants temporarily displaced by housing retrofits. Additionally, the City can consider methods such as a 'green lease' to address the 'split incentive' issue, and to prevent tenants paying for property improvements. Split incentives occur when the person paying for the upgrade, the building owner/manager, does not directly benefit from the improvement. Rather, the cost benefit goes to the utility bill payer, who is using less energy so saving money. In market rate housing, the green features in a building can also increase the amount rent that a building can ask for to account for the amenities that are included.

Performance and Equity Metrics

- Reduction in citywide natural gas use
- Number of building electrification retrofits
- Number of building retrofits for CARE/FERA customers
- Number of building electrification retrofits in SB 1000 disadvantaged communities
- Tracking upgrades to infrastructure to facilitate electrification

Existing Building Electrification and Efficiency Strategy

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
High	$$	Resilience, air quality, public health	Community Development, Public Works, City Manager, CAO

Cornerstone Actions

- **EBEE-1: Electrification and Efficiency Strategy.** By 2028, develop a phased-in Existing Building Efficiency and Electrification strategy to retrofit 85% of existing homes and businesses to all-electric by 2030. Components include, but are not limited to:
  a. Partner with BayREN, utilities, schools, and other partners to implement a direct install program for energy efficiency and electrification improvements for disadvantaged populations and businesses.
  b. Establish an early natural gas equipment buyout program to incentivize early retirement of gas-powered equipment and building systems.
  c. Explore and establish financing mechanisms to fund municipal incentive programs including bonds or taxes.
  d. Partner with BayREN to establish a pilot program to reduce refrigeration-related emissions by providing free audits and retrofits to food retail establishments and restaurants.

Additional Implementation Actions

- **EBEE-2: Strategy development**: Establish adaptive policies and programs to meet the carbon neutrality goal.
  a. By 2025, initiate a conversation with SCP and RCPA about regional coordination around existing building electrification efforts.
  b. By 2026, explore existing building electrification and electric-ready policy options including establishing building performance standards, indoor air quality standards, and upgrade at time of replacement, time of property transfer, or time of permit requirements.
  c. Establish benchmarking and retrofitting requirements for nonresidential buildings, exploring the potential for a building performance standard.
       i. By 2026, conduct a study to determine the appropriate square footage threshold to capture additional buildings than is required by AB 802 for benchmarking. AB 802 is the "Building Energy Benchmarking Program." The Building Energy Benchmarking Program requires owners of large commercial and multifamily buildings to report energy use to the California Energy Commission by June 1 annually.
       ii. By 2026, work with PG&E and SCP to implement retro-commissioning in the existing building stock.
       iii. By 2027, prepare and adopt an ordinance establishing benchmarking and retrofitting requirements for nonresidential buildings
  d. Improve the energy efficiency of existing residential buildings focused on disadvantaged communities.
       i. By 2026, require low-rise residential properties older than 10 years to provide an energy audit, disclose Home Energy Rating System (HERS) score or EPA Home Energy Score at time of sale or rental agreement.

ii. By 2027, adopt an ordinance requiring energy submeters to be installed in multifamily residential properties.

    e. By 2027, identify best practices for renter protections, so that energy retrofits are not used as a tool to displace, relocate, or harass tenants.

- **EBEE-3: Community activation for electrification and efficiency.** By 2026**,** support electrification and efficiency efforts by connecting residents and business to existing resources and developing financing options with a focus on disadvantaged communities.
    a. Work with local businesses to promote electric appliances in-store.
    b. Explore enhancing SCP's incentive program with a reduced-cost electric heat pump space heater and water heater program for income-qualified residents.
    c. Establish an education campaign around cooking with electric appliances, including demonstrations from chefs and/or local restaurants.
    d. Partner with SCP, PG&E, BAAQMD, and BayREN to explore opportunities to incentivize electrification for CARE/FERA customers.
    e. Connect residents, businesses, architects, and contractors to existing building electrification and efficiency resources and incentives provided by Sonoma Clean Power, PG&E, BayREN, Sonoma County RCPA, and others.
    f. Explore and establish financing mechanisms to fund municipal incentive programs including bonds or taxes.
    g. Assess feasibility of waiving permit approval fees for electrical upgrades to support the future installation of new electric appliances that will replace existing natural gas.
    h. Provide technical resources and funding to support community partners and companies in developing green jobs including hosting workforce development trainings for installers and building owners/operators to discuss benefits and technical requirements of electrification.
    i. Engage with stakeholders including residential and nonresidential property owners, managers, real estate agents, leasing brokers, and Chamber of Commerce to explain the benefits of providing a Home Energy Score.
- **EBEE-4: Monitoring electrification.** Create a system to monitor the replacement of natural gas equipment with electric equipment and other decarbonization retrofits.
    a. By 2026, create an electric equipment installation permit category.
    b. By 2026, establish an annual reporting system to inform the Climate Action Commission on progress on the switching from natural gas to electric equipment.
    c. By 2027, establish a citywide ordinance requiring grocery stores to report to City annually on progress toward 2030 state requirement for low-carbon refrigerant retrofits.
    d. By 2028, establish a process to record decarbonization status from each property at the time of sale. Explore requiring property owners to report building decarbonization status using tools, such as XeroHome.
- **EBEE-5: Distribution infrastructure**: Continue to work with PG&E and SCP to determine electric distribution system and service infrastructure limitations and work to resolve issues, including a focus on improving access reliability in disadvantaged communities.
    a. By 2030, work with PG&E to identify opportunities for natural gas infrastructure pruning to reduce the chance of stranded assets, provide potential funding, and establish an efficient transition to carbon neutral buildings.

Examples of Funding Opportunities

- SCP Electrify program[34] and BayREN Home+ Rebates
- CEC's Low-Income Home Energy Assistance Program (LIHEAP) and the Low-Income Weatherization Program
- SCP and BayREN Home+ Rebates
- PG&E's OBF (On Bill Financing) program

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[34] https://sonomacleanpower.org/programs/scp-electrify

Transportation and Land Use Action Plans

Transportation and land use programs are a fundamental part of Petaluma's plan to reach carbon neutrality by 2030. Transportation-related emissions are the largest contributor to community-wide emissions, accounting for 67% of total emissions. Reducing emissions to achieve the City's target will require significant investments in active transportation infrastructure, transit service, transportation demand and parking management programs that reduce single-occupancy vehicle travel, and investment in electric vehicle infrastructure. It also means prioritizing people, cyclists, micromobility, and transit modes over cars, guaranteeing these modes are safe, more convenient, and less costly to use, and creating a healthier and cleaner future. Likewise, land use and neighborhood design impact where people travel, how far people go, and by what vehicle mode they make their trips. Compact, mixed-use neighborhoods encourage non-auto travel to meet daily needs.

This section includes five interrelated transportation and land use action plans including:

- Transportation and Land Use Coordination
- Transportation Demand Management and Parking
- Active Transportation and Complete Streets
- Vehicle Electrification and Electric Mobility
- Transit Service

Transportation and Land Use Coordination Strategy

Intent: Petaluma manages land use change to support greenhouse gas reduction targets by focusing development in location-efficient places, creating complete neighborhoods, and increasing density. Complete, mixed-use neighborhoods allow residents to access most of their everyday needs within a short walk, bike, or transit trip. The City manages a transportation system that improves mobility for everyone and reduces the amount of driving by using roadway and parking pricing, combined with financial incentives and regulations, to help activate and manage demand for safe, attractive, multimodal infrastructure.

> **What is a Complete Neighborhood?**
>
> A neighborhood where residents can reach community amenities (e.g., grocery stores and retail), public facilities (e.g., parks and community centers) and services (e.g., health care and affordable childcare) within a 15-minute walk.

Land use describes the human use of the land. In Petaluma, there are dozens of different types of uses, including housing, parks, shopping, and schools. Land use and neighborhood design impact where people travel, how far people go, and by what vehicle mode, e.g. driving, walking, biking, or taking transit, they make their trips. Compact, mixed-use neighborhoods that offer housing to a range of income levels, support street connectivity, and facilitate high-quality transit access encourage non-auto travel to meet daily needs. Housing Petaluma's workforce is essential to reducing commuting, vehicle miles traveled, and the associated greenhouse gas emissions. Furthermore, multifamily development is more energy efficient to build and operate than larger single-family housing.[35] Through the City's General Plan and Zoning Code, Petaluma will make sustainable land use practices the norm.

Equity Considerations

The Transportation and Land Use Coordination Action Plan aims to coordinate future land use and transportation decision-making to ensure a cleaner and healthier future. Disadvantaged communities face higher burdens from environmental pollution, traffic collisions, and longer commutes. This action plan requires streamlining affordable housing production and increasing housing opportunities in high-resource neighborhoods across the city. New development in existing disadvantaged communities may also increase displacement pressure. Policies and programs associated with tenant and small business protections should be explored by the City.

Performance and Equity Metrics

- Number of housing units near high-quality transit
- Number of affordable housing units within 0.5 miles or 15-minute walk of high-quality transit
- Achieve Regional Housing Needs Allocation (RHNA) targets for all income levels. Meet requirements to affirmatively further fair housing
- Proportion of population in complete neighborhoods

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[35] Berrill, Peter and Gillingham, Kenneth T. and Hertwich, Edgar G. (2021). Linking Housing Policy, Housing Typology, and Residential Energy Demand in the United States. Environmental Science & Technology: 55, 4, 2224–2233. Available from: https://doi.org/10.1021/acs.est.0c05696.

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
High in complete neighborhoods Low to Moderate Citywide	$	Air quality, public health, reduced congestion	Community Development

Cornerstone Actions

- **TLUC-1: General Plan Update.** By 2027, adopt the updated General Plan that defines transit-oriented communities, complete 15-minute neighborhoods, and incremental infill within the City's existing residential neighborhoods.
  a. Locate housing and jobs close to high quality transit corridors.[36]
  b. Define transit-oriented communities at high-quality transit stops that mix quality development, affordable housing, community services and amenities, and improved mobility options. Adopt the General Plan Land Use Designations to expand housing capacity by increasing heights and densities within transit-oriented communities.
  c. Establish complete 15-minute neighborhoods around Town Centers, Neighborhood Centers, and other active nodes to enable residents to access most of their daily needs with a short walk, bike or transit trip. Develop maps defining the boundaries of complete neighborhoods and inventory services and amenities and allow for temporary or "meanwhile" uses to facilitate the transition to complete neighborhoods.
  d. Enable incremental infill within the city's existing residential neighborhoods, including accessory dwelling unit and plex housing types.
  e. Examine rezoning to allow for light-touch, missing middle housing up to 10 units per acre. Identify and implement streamlining provisions established in SB 10.[37]
- **TLUC-2: Zoning Code revision.** By 2027, adopt a revised Zoning Code based on the updated General Plan.
  a. Update the zoning districts consistent with the General Plan Land Use Designations and Housing Element.
  b. Allow a diversity of services and amenities in each complete 15-minute neighborhood, including childcare, food service and retail, community gardens, mobile food truck/carts, and other amenities. Increase the types of home-based businesses allowed in residential neighborhoods.
  c. Increase density and height standards to expand housing capacity.
  d. Revise zoning standards related to substantial modifications to require existing parking lots are brought to current code requirements for landscaping, tree canopy, and stormwater, and EV charging.
  e. Consider incentives like a density bonus for building design and use of materials that sequester carbon (e.g., mass timber, carbon sequestering concrete processes).

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[36] High Quality Transit can be defined as fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (SCAG 2022).

[37] SB 10 (2021) provides that local agencies may adopt an ordinance to allow up to 10 dwelling units on any parcel, at a height specified in the ordinance if the parcel is within a transit-rich area or urban infill site.

Additional Implementation Actions

- **TLUC-3: Development streamlining.** By 2027, streamline development consistent with City's vision for carbon neutrality through zoning, permitting, and approval processes.
    a. Establish Housing Sustainability Districts (HSDs), or a similar overlay, to streamline housing production on infill sites near high-quality transit consistent with CA Govt. Code Section 66200.
    b. Establish additional incentives in the zoning code to facilitate affordable housing in transit-oriented communities.
    c. Develop a comprehensive package of targeted incentives and regulations, such as new zoning designations, that increase access to specific amenities and services to create complete neighborhoods, such as density bonuses for the provision of a grocery store or exemptions for neighborhood servicing retail from parking standards or fees.
    d. Establish new approval and permit streamlining for new housing that exceeds inclusionary and sustainability requirements.
- **TLUC-4: General Plan implementation.** By 2026, begin program implementation for the General Plan.
    a. Continue complete 15-minute neighborhoods working group lead by the Planning division in collaboration with other departments and existing community efforts.
    b. Continue to partner with, financially support, and promote the Napa Sonoma ADU Center to provide information and technical support to the public on ADU regulations and implementation.
    c. By 2024, partner with schools or organizations to conduct neighborhood asset and boundary mapping exercises for Petaluma neighborhoods.
    d. Complete a mobility and last-mile hubs study to determine the financial costs, infrastructural needs, and economic feasibility to establish hubs and refine the hub recommendations by MTC with the General Plan Land Use Map and Mobility Frameworks.
    e. Develop and continue programs to support small property owners to add housing, e.g., accessory dwelling units through education, preapproved plans, and financial incentives

Examples of Funding Opportunities

- General Fund
- Development Impact Fees

Transportation Demand Management Strategy

Intent: Petaluma manages travel demand by reducing single-occupancy vehicle trips, incentivizing active transportation and transit use to lower VMT and greenhouse gas emissions.

Transportation demand management (TDM) and parking management seek to reduce single-occupancy vehicle (SOV) travel and shift trips to walking, biking, scooting, rideshare, and transit. TDM manages transportation resources through pricing, incentives, services, marketing, and other techniques. A key element of a comprehensive trip-reduction strategy is parking management. Strategies like parking maximums, unbundling, and shared parking reduce parking demand, minimize vehicle trips, optimize use of the parking supply, and support walkable neighborhoods. Robust TDM and parking management programs represent some of the largest opportunities to reduce transportation-related emissions in Petaluma and will be implemented the City's General Plan and Zoning Code.[38]

Equity Considerations

In general, TDM helps support positive equity outcomes. TDM and parking programs, like unbundling parking, help improve transportation alternatives to the car, more accurately reflect the cost of travel, reduce emissions, and may provide direct benefits such as financial savings and more affordable transportation options. Other equity considerations may include the accessibility of the transit or active transportation in disadvantaged communities and exploring a transportation benefits program, like Universal Basic Mobility, for Petaluma's low-income residents.

Performance and Equity Metrics

- Vehicle miles traveled
- Number of publicly accessible bike parking stalls
- Miles of bike lane installed per year, by class
- Number of free/subsidized transit pass rides/year
- Transportation Demand Management Action Plan Adoption

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
High (for new projects or neighborhoods with constrained parking) Low to Medium Citywide	$$	Air quality, public health, reduced congestion, quality of life benefits, safety benefits	Community Development, Public Works & Utilities

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[38] TDM for City employees is addressed separately. See Employee Transportation Demand Management Strategy, P. 99.

Cornerstone Actions

- **TDM-1: Transportation Demand Management (TDM) Policy.** By 2026, revise TDM policy that requires employers to submit an emission reduction plan to the City to meet the City's greenhouse gas reduction target.

Additional Implementation Actions

- **TDM-2: TDM policy implementation.** Use TDM to reduce single-occupancy vehicle travel and provide information and incentives to existing and future residents, employees, and visitors to encourage non-automobile travel. Utilize available resources from ABAG and coordinate with other transportation programs.
    a. By 2026, conduct focus groups with large employers, small employers, and housing developers on their opportunities and challenges of implementing a TDM program.
    b. By 2026, establish a City-led TDM program (or non-profit Transportation Management Authority), with dedicated oversight, to implement the TDM policy requirements.
    c. By 2027, establish annual reporting requirements to the City Council.
    d. By 2027, create packages of public educational materials for each TDM tier that building owners/managers and employers can download from the City website. Require the materials be posted in a public place in the building as part of the TDM ordinance.
    e. By 2028, adopt an ordinance establishing penalties for non-compliance with the TDM policy. Establish procedures to use penalty revenue to fund active transportation improvements in disadvantaged communities.
    f. By 2028, establish a voluntary TDM program for existing businesses, smaller employers, and new housing developments to provide employees and residents with educational materials about active transportation and transit options within the city
- **TDM-3: VMT reduction and banking.**
    a. By 2026, adopt a VMT-based development impact fee program.
    b. Continue to coordinate with SCTA on the regional VMT mitigation bank.
- **TDM-4: Universal Basic Mobility Program.** By 2026, evaluate the feasibility of funding a transportation benefits program, e.g. Universal Basic Mobility Program, for existing low-income residents in disadvantaged neighborhoods. Conduct a survey of low-income residents in disadvantaged communities to understand financial, logistical, and informational barriers to transportation to inform a Universal Basic Mobility program.
- **TDM-5: Sonoma Go.** By 2026, coordinate with Sonoma County Transportation Authority Go Sonoma program reauthorization.
- **TDM-6: TDM and parking management for schools.** Partner with Petaluma schools to voluntarily implement TDM plans and parking management strategies.

Examples of Funding Opportunities

- General Fund
- Development impact fee / VMT impact fee
- Parking fee revenue fund
- TDM penalties
- Update and reconsider updated traffic impact funds – fund bank

Parking Management Strategy

Intent: Petaluma manages travel demand by managing parking resources more efficiently to lower VMT and greenhouse gas emissions.

Combined with TDM, parking management represents some of the most effective approaches to reduce vehicle miles traveled and encourage individuals to switch to travel modes to walking, biking, rolling, and transit use. As a result, parking management also contributes to greenhouse gas emission reduction. Strategies like parking maximums, unbundling or selling/leasing parking spaces separate from the lease of the residential or commercial property, and shared parking reduce parking demand, minimize vehicle trips, optimize use of the parking supply, and support walkable neighborhoods. Many of these interventions require updates to the City's Zoning Code.

Equity Considerations

Pricing parking generally leads to a more equitable transportation system by focusing on providing better access to opportunities and resources in marginalized communities and shifting the costs of driving to drivers. However, as certain neighborhoods in cities experience growth and affordability challenges, lower-income populations may be displaced further limiting access to transit and creating the need to focus on the cost implications for parking pricing strategies.

Performance and Equity Metrics

- Vehicle miles traveled
- Number of parking spaces removed per year
- Parking revenue

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
High (for new projects or neighborhoods with constrained parking) Low to Medium Citywide	$$	Air quality, public health, reduced congestion, quality of life benefits, safety benefits	Community Development, Public Works & Utilities
Cornerstone Actions			
• **PM-1: Parking management policy.** By 2027, establish a parking management policy to balance supply and demand, to reduce demand for parking, and to meet target utilization rates at key destinations through the use of dynamic pricing.			

Additional Implementation Actions

- **PM-2: Parking policy and standards.** Reform parking standards for new development to prioritize parking for bicycles, electric vehicles, and carshare, remove parking minimums, and unbundle parking.
    a. By 2026, establish a policy in the General Plan and update the Zoning Code to require residential and nonresidential development projects to unbundle parking from the purchase or lease of a residential or commercial use.
    b. By 2026, establish a policy in the General Plan and update the Zoning Code to facilitate shared parking facilities to allow multiple uses on separate properties to use parking more efficiently.
    c. By 2026, revise the City's bicycle parking standards, decoupling the standards from the automobile standards, and establishing standards for short- and long-term parking, showers, and other facilities based on building square footages and/or bedrooms.
    d. By 2026, revise the City's carpool and van pool parking standards to be consistent with California Green Building Code Tier 2 requirements.
    e. By 2027, create a comprehensive parking management strategy that includes the removal of parking minimums and establishes parking maximums for new development in the Zoning Code.
- **PM-3: Public parking supply and management.** Reduce parking supply and increase cost of parking to create constrained parking environments adjacent to transit-oriented and mixed-use neighborhoods.
    a. By 2026, exempt infill projects in identified high quality transit corridors from all parking requirements.
    b. By 2026, conduct focus groups with local community groups on potential parking changes. Hold meetings at places in the community that are frequently visited and in disadvantaged communities.
    c. By 2027, establish residential parking permit areas around transit-oriented and mixed-use neighborhoods to minimize spillover parking.
    d. By 2027, establish a parking fee revenue fund and program to reinvest parking revenues into mobility programs and capital improvements. Reserve a percentage of revenues for use in disadvantaged communities, or into the programs that directly benefit the district where the fees are collected.
    e. By 2027, increase the City's capacity to effectively manage and enforce parking including providing real-time parking information.
    f. By 2030, expand paid parking citywide in all transit-oriented and mixed-use neighborhoods.

Examples of Funding Opportunities

- General Fund
- Development impact fee / VMT impact fee
- Parking fee revenue fund

Active Transportation and Complete Streets Strategy

Intent: The City provides a multimodal transportation network that prioritizes walking, biking, rolling, and transit use over auto travel.
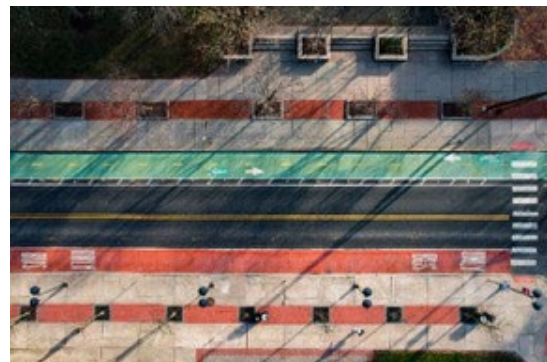
What are Complete Streets?

Complete Streets are planned, designed, constructed, reconstructed, operated, and maintained to be safe and comfortable for everyone, regardless of age, ability, ethnicity, race, sex, income, disability or chosen transportation mode. Complete Streets provide safe mobility and improved connectivity to community destinations for all users, and especially for people walking, rolling, biking, and riding transit. And to the extent practicable, integrate street trees and green infrastructure into planned public road improvements to 1) improve air and water quality, 2) create more inviting streets, and 3) create streets that are resilient to extreme heat and precipitation events caused by climate change. (MTC 2022)

Foundational to meeting the City's carbon neutral target is to redesign the City's streets around people rather than vehicles. TDM and parking management programs to shift travel mode from single-occupancy vehicle trips must be accompanied by improvements to the active transportation system, which creates a safe, integrated, and seamless network that encourages people of all ages and abilities to conveniently travel throughout the city. With upgrades to the active transportation network and transit services—such as with new protected bike facilities or Petaluma Transit services — Petaluma will become a community with comfortable, inviting spaces for biking and walking and frequent transit service within a short distance.

Equity Considerations

Complete streets and equity are closely connected. Complete streets affect health by making places where it is safe and comfortable to be healthy and active. Historically, disadvantaged communities face higher burdens from traffic collisions with streets having a concentration of higher vehicle speeds. Other equity considerations include costs such as those associated with a bikeshare membership or e-bike purchase. This action plan lays the foundation for a re-envisioned framework for modal priority and implementation of complete streets and the active transportation network.

Performance and Equity Metrics

- Walk and bicycle mode share
- Low stress bicycle network lane miles by type
- Low stress bicycle network lane miles by type in disadvantaged communities
- Bicycle and pedestrian collisions with vehicles by demographic characteristics
- All collisions that result in serious injury or a fatality
- Accessibility of high-quality transit stops (geographic spread)
- Average road speed on multimodal streets

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$$$	Air quality, public health, safety, reduced congestion	Public Works & Utilities, Community Development

Cornerstone Actions

- **AT-1: Active transportation and complete street improvements.** By 2026, establish complete streets policy and incorporate complete streets improvements into all roadway and development projects to reduce vehicle miles traveled through implementation of the following plans and initiatives. Focus plan implementation in disadvantaged communities.
  a. Speed limit reductions where appropriate
  b. Local Road Safety Plan
  c. Active Transportation Plan
  d. Vision Zero
  e. Update City's Complete Streets Policy to align with Metropolitan Transportation Commission's Revised 2022 Complete Streets Policy. Along with standards to ensure safe travel and improved connectivity, incorporate specifications for tree canopy, landscape planting and management, stormwater management, removal of impervious cover, and other key criteria.
  f. Adoption of the General Plan, revised mobility policy, and complete street guidelines

These plans implement the Blueprint's goals for active transportation and complete streets.

Additional Implementation Actions

- **AT-2: Bike sharing.** By 2027, establish a bike sharing program with hubs throughout the city, and consider facilitating other shared micro mobility modes.
  a. Evaluate the success of the Sonoma Marin Bikeshare Pilot program to inform a permanent citywide e-bikeshare program. Evaluate the feasibility of an e-bike subsidy program.
- **AT-3: Active transportation funding.** By 2027, adopt a policy to prioritize transportation investments that reduce vehicle miles traveled per capita (VMT) and greenhouse gas emissions. Consider establishing a minimum proportion of discretionary transportation funding dedicated to active transportation.
- **AT-4: Active transportation activation and education.**
  a. By 2027, work with Petaluma City Schools, Waugh, and Old Adobe School Districts to ensure school bus and school pool (by carpool, walk, and bike) programs are widespread, include Safe Routes to School. Determine whether expanding neighborhood school allocation could reduce crosstown travel.
  b. By 2028, train and deploy public safety staff on dedicated bike and pedestrian paths to ensure safety and promote public use.

c. By 2027, establish a process to engage neighborhood residents in complete street design. Offer and vigorously promote ongoing programs to encourage adoption of active transportation (e.g., Ciclavia).
d. By 2027, establish a tactical urbanism program with approved street improvements.
e. By 2027, become an official Bike Friendly City.
f. By 2028, add wayfinding signage for pedestrians, bikes, and micromobility network.
- **AT-5: Curb management.** By 2027, improve curb management to prioritize rideshare parking/loading zones, scooter and bike share docks, bike parking, EV charging stations, and autonomous vehicle loading zones.

Examples of Funding Opportunities
- Development impact fees
- Regional, state, and federal grant programs (details to be provided in ATP)
- Parking fee revenues fund

Transit Service Strategy

Intent: Petaluma expands and improves transit and shared mobility services to be more accessible, affordable, and timely.

Robust regional and local transit service is critical to serving the needs of workers, residents, and visitors in Petaluma. The city is served by the Sonoma-Marin Area Rail Transit (SMART), Sonoma County Transit, Golden Gate Transit, and Petaluma Transit.

To reduce the number of overall vehicle trips, there must be an increase in transit service. Future expansion, including the SMART Petaluma North Station, and investment in transit and shuttle service must be coordinated with complete street design improvements. Priority for transit on key streets, and strategies for coordination between transit agencies and other travel modes will improve connectivity and access for passengers using transit services.

Equity Considerations

Transit offers safe, affordable, timely, and convenient access to places that provides an essential service for lower-income people within limited mobility options. The prioritization of auto travel has created disparities in transit and car travel, safety considerations, and infrastructure that is inaccessible to people with disabilities are all equity consideration for this transit action plan. Further considerations may include the number of jobs held by low-income individuals and the need to access their destination in a timely manner which may include locations outside Petaluma. Low wage earners, such as restaurant employees frequently need timely access to transportation on a different schedule than 9-5 commuters.

Performance Equity Metrics

- Transit mode share
- Passengers per day
- Revenue vehicle miles and revenue vehicle hours (total and per passenger)

- Transit service frequency
- Transit access and equity (e.g. in disadvantaged communities)
- Miles of bus-only lanes established
- Number of real-time bus signs installed
- Number of micromobility users or trips

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low to Medium	$$	Air quality, public health, safety, reduced congestion	Public Works & Utilities (Petaluma Transit)

Cornerstone Actions

- **TS-1: Petaluma transit service.** Expand and improve Petaluma Transit and shared mobility services to be more accessible, affordable, and timely through:
  a. Fare free programs for all Petaluma Transit by 2025.
      i. Partner with Petaluma City Schools, Waugh, and Old Adobe School Districts to promote transit youth through free passes and gamified outreach such as bus route scavenger hunts and bus shelter student art contests.
  b. Short Range Transit Plan by 2026.
      i. Incorporate greenhouse gas emission reduction as a plan objective.
      ii. Assess service and service performance in disadvantaged communities.
  c. Continued improvement of facilities, real-time information, and service by 2030.

Additional Implementation Actions

- **TS-2: Transit stop infrastructure.** (Ongoing), continue to upgrade and improve Petaluma Transit infrastructure including benches, bike racks, ADA improvements, shelters, real-time signage consistent with Petaluma Transit's plans.
  a. By 2026, conduct surveys on perceptions of existing transportation infrastructure and needed improvements with local active transportation groups, commuter groups, and other stakeholders. Conduct the surveys on-board transit, online, and out in the community.
  b. By 2030, install transit signal prioritization and bus-only lanes.
  c. By 2030, install bus pull-outs at all feasible bus stops along major arterial streets.
- **TS-3: Microtransit pilot program.** By 2025, establish an on-demand microtransit pilot program to provide transit services in disadvantaged and other communities. Assess the success of the service. Determine measurements of success and additional service zones for potential future implementation.
- **TS-4: Transit service planning.** Through Petaluma Transit's planning processes, such as the SRTP, by 2026, conduct a study to determine where and when increased levels of service are needed throughout the city, including:
  a. Increased frequency on major transit corridors and routes – especially Washington St, McDowell Blvd, Lakeville Highway and Petaluma Blvd.
  b. Determined the number of vehicles and costs required to provide sufficient service levels to fulfill Blueprint goals

c. Adding weekend and evening service
d. Mobility options
e. Creating new connections with SMART stations via new service types
f. Additional transit service to Downtown Petaluma
g. Evaluation of new stop locations
- **TS-5: Transit access planning.** Through Petaluma Transit's planning processes, such as the SRTP, by 2026, develop a funding plan for improving bike and pedestrian network connections to bus stops.
- **TS-6: Regional coordination and partnership.**
    a. Continue to engage with SMART at the staff and Pedestrian and Bicycle Advisory Committee levels.
    b. Continue to work with Sonoma County Transit and Golden Gate Transit to transition their revenue vehicle fleets to ZEVs.
    c. Continue participation in the MTC, SCTA initiatives to facilitate transit recovery.
    d. Partner with Petaluma People Services Center to help transition their iRide to ZEVs.

For implementation actions related to Petaluma Transit fleet vehicles and charging, see the Municipal Action Plan.

Examples of Funding Opportunities
- Federal Transit Administration (e.g., FTA 5307)
- Sales tax revenues (e.g., Transportation Development Act (TDA), State Transit Assistance (STA), and Sonoma County Transportation Measure M)
- Low Carbon Transit Operations Program
- Impact fees
- Strategic Growth Council's Affordable Housing and Sustainable Communities Grant – Petaluma North SMART Station
- Transit fares

Vehicle Electrification and Electric Mobility Strategy

Intent: The City establishes a vehicle electrification and electric mobility strategy to accelerate the use of zero-emission vehicles and electric vehicle options. In conjunction with policies that discourage people from driving, active transportation infrastructure, and transit service improvements, achieving carbon neutrality by 2030 will also require a rapid transition to zero-emission vehicles (ZEVs) that run on clean energy provided by Sonoma Clean Power. By 2030, all miles driven in Petaluma need to be zero emission. State policy requires all light-duty vehicles sold in California to be ZEV starting in 2035 and in 2045 for mid- and

heavy-duty vehicles. Petaluma will invest in expanding the network of charging infrastructure to promote the transition to zero-emission vehicles and continue transitioning the City's fleet to zero-emission vehicles.[39]

Equity Considerations

Disadvantaged communities face higher burdens from the transportation system, including environmental pollution, due part to their adjacency to Highway 101 and high-volume roadways. Cleaner vehicles produce few emissions and help reduce that pollution burden. Equity considerations associated with vehicle electrification also include financial access to electric vehicle ownership, charging "deserts", accessibility for those with disabilities, costs associated with installing charging infrastructure and potential electric panel replacement, and ability to have charging infrastructure (renters vs. owners). The Vehicle Electrification and Electric Mobility Action Plan aims to emphasize equity considerations with planning investments in electric vehicle infrastructure, including the creation of fast-charging hubs serving Petaluma's disadvantaged communities.

Performance and Equity Metrics

- Percent of electric vehicles in new vehicle sales
- Charging stations in disadvantaged communities
- Public charging facilities (level 2 and DC Fast Chargers)
- Workplace charging facilities
- Code updates to facilitate/require installation of EV charging in new development

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium to High	$$	Air quality, public health	Community Development, Public Works & Utilities

Cornerstone Actions
- **VEEM-1: Electric vehicle charging infrastructure strategy**. By 2027, develop an EV charging infrastructure strategy focusing on workplaces, schools, and multi-unit dwellings aligned with utility and State provided incentives and focused initially on disadvantaged populations and neighborhood hubs.

Additional Implementation Actions
- **VEEM-2: Publicly accessible charging infrastructure**. Expand reliable, publicly accessible electric vehicle charging across Petaluma. Ensure that it is financially and geographically accessible.
  a. Continue to work with PG&E and Sonoma Clean Power to ensure the electrical grid has the capacity to support large scale electric vehicle charging at all multifamily properties. By 2026, explore amending EV charger permitting requirements to include operation and maintenance plans for EV charger installations of four or more ports.

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[39] See ZEV Fleet and Bus Strategy, P. 97.

b. By 2026, explore how businesses are approaching EV Infrastructure and cohabitating business are located near charging stations.

c. By 2027, require new development to meet CalGreen Tier 2 standards for electric vehicle charging.

d. By 2027, complete a study to establish a curbside charging pilot program.

e. By 2028, create a fast-charging hub serving a "disadvantaged community" as identified in the General Plan.

f. By 2030, expand charging to 10% of spaces within privately-owned large commercial garages.

- **VEEM-3: Electric mobility pilot and incentives.** Launch a series of pilot programs and incentive programs to support the transition to electric vehicles and mobility, remaining flexible about how vehicle electrification continues to evolve and the varied and evolving uses, including hydrogen fuel cells, trucks, and towing.

  a. By 2026, collaborate with local bicycle and scooter businesses to launch a pilot project to test the use of accessible bicycles, e-bicycles, and e-scooters for recreation and commuting.

  b. By 2026, pilot the use of zero-emission vehicles, e-bikes, and electric scooters for delivery and meal delivery services.

  c. By 2027, develop/consolidate a comprehensive package of incentives to encourage the adoption of zero emission vehicles (ZEVs) including establish a fee waiver and/or permit streamlining program to support the installation of EV charging stations in existing residential, mixed use, and commercial development.

  d. By 2029, Study creating a pilot Zero Emission Delivery Zone.

- **VEEM-4: Public awareness campaign.** Launch a public awareness campaign, including messaging tailored to specific communities, with the goal of educating residents about the health, economic, and environmental benefits of transit, active transportation, and electric vehicles in partnership with SCTA and RCPA.

For implementation actions related to City fleet vehicles and charging at City facilities, see the Municipal Action Plan.

Examples of Funding Opportunities
- Sonoma Clean Power
- CALeVIP program
- California Deployment Plan for the National Electric Vehicle Infrastructure

Water Action Plan

Water is a critical resource in California and Petaluma. Regional water supplies are already being adversely affected by climate change induced drought and decreased snowpack. Climate change is impacting local hydrology and affecting natural recharge to groundwater aquifers so that local groundwater is only used as supplemental or emergency supply. Lower rainfall and/or more intense runoff, increased evaporative losses, and warmer and shorter winter seasons can alter natural recharge of groundwater.

> **What is included?**
> *This action plan includes strategies for water conservation, primarily in buildings and landscape. It is not a comprehensive list of actions. The City has other water plans that guide future decision-making and actions around water supply, drought, and water use.*

Although GHG emissions related to water consumption in Petaluma account for less than 1% of the communitywide total emissions, the ecosystem and quality of life benefits that reliable clean water provide are important to protect. Thus, reducing indoor and outdoor water use through fixture upgrades and climate-appropriate landscaping for both residential and nonresidential buildings is incorporated in the Blueprint for Climate Action.

Water Strategy

Intent: Achieve the most efficient water use possible in Petaluma to ensure a safe and resilient water supply while providing important habitat, water quality, stormwater capture, and other environmental benefits.

Petaluma purchases approximately 95% of its potable water from Sonoma Water. The City meets the other 1-10% of demand with locally-pumped groundwater. The City offsets 2-3% of demand with non-potable recycled water generated by the Ellis Creek Water Recycling Facility (ECWRF). ECWRF is currently able to recycle 100% of all tertiary-treated water produced during the irrigation season, but it is at capacity during the peak summer months. There is a capital improvement project that will increase peak tertiary treatment capacity from 4.68 to 6.8 MGD, producing a yield of 712 AFY to meet peak demands.

This strategy aims to reduce indoor and outdoor water use by providing alternative sources of water, including recycled water and greywater in line with the Urban Water Management Plan, evaluating CALGreen Tier 2 water efficiency requirements for alterations, additions, and remodels, and promoting existing rebate programs.[40]

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[40] The state's current standard for individual indoor residential water use (gallons per capita per day, or GPCD) is 55 gallons, but with the passage of SB 1157 the standard will be lowered to 47 GPCD from 2025-2030.

Equity Considerations

Requirements for water fixture upgrades should be accompanied by subsidies for low-income households. One action included in the Water Action Plan is to increase the existing subsidy for low-flow toilets and fixtures to include support for installation.

Performance and Equity Metrics

- Consumption of Gallons per capita per day (GPCD)
- Number of WELO compliant landscape renovations
- Number of participants in City water conservation rebate programs
- Number of direct install water efficiency upgrades
- Percent of water supply from recycled water

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$$	Resilience, ecosystem	Public Works and Utilities, Community Development

Cornerstone Actions

- **W-1: Resilient water supply:** By 2030, create a resilient water supply by increasing conservation, utilizing and expanding existing incentive programs to include direct-install, implementing a tiered rate structure, and exploring greywater requirements as part of building code for all new construction and major renovations of existing buildings.

  Achieve 100% compliance with State Water Use Objectives (to be adopted) for indoor and outdoor water use. Align Urban Water Management Plan and Blueprint objectives.

Additional Implementation Actions

- **W-2: Water policy, ordinances, and permitting.** By 2026, research example water neutrality ordinances and incentives and current greywater permitting processes and determine which type of systems to pre-qualify.
    a. By 2026, continue to utilize, promote and build- out online permit application submittal and processing systems, and shorten the inspection process to one inspection for qualifying greywater systems.
    b. By 2028, explore adopting a tiered rate structure for water use, and mandatory benchmarking, audits, and retrofits for disproportionately high-water users. Conduct a cost-of-service study.

- **W-3: Building water conservation and efficiency.**
    a. (Ongoing) Hold giveaways for aerators and nozzles at public events or establish a periodic door-to-door or pick-up program offering immediate installations.
    b. (Ongoing) Continue implementing and evolving public education campaigns that highlights water conservation practices and promotes and provides demonstrations of graywater, mulching and rainwater systems focusing on low-income customers with organizations like Daily Acts.

c. By 2026, engage stakeholders including Sonoma Water, QWEL certified landscapers, developers, architects, and property owners regarding the purpose and impact of the requirements.

d. By 2026, amend Municipal Code Sec. 15.17.050 with improved landscape water use efficiency standards and amend Sec. 15.17.050(C)(4) with new Petaluma River-Friendly Landscaping guidelines. Consider restricting or disallowing lawn installations or replacements, including disallowing artificial turf except in cases of athletic facilities.

    i. Explore setting standards and/or providing incentives to reduce the use of nonpermeable paving for non-transportation traveling hardscape.

e. By 2026, adopt the CALGreen Tier 2 water efficiency and conservation requirements for additions, alterations, and remodels as part of the 2025 Building Code update. Consider additional incentives or exceptions for affordable housing development.

f. By 2028, explore a direct install water efficiency upgrade program for customers qualified for subsidized water/sewer rates. Include items, such as, but not limited to, low-flow toilets, weather-based irrigation controllers, rainwater capture systems, laundry to landscape greywater systems, backflow preventers, and drip irrigation.

g. By 2028, create a social media campaign with a recognition program to highlight Petaluma residents and businesses that have successfully modified their landscaping and/or reduced indoor water consumption.

- **W-4: Alternative water sources and infrastructure.**
  a. (Ongoing) continue collaborating with Petaluma Groundwater Sustainability Agency for long-term regional sustainable water management.

  b. (Ongoing) Explore the feasibility of purple pipe expansion, dual plumbing, and blackwater system installation in the update of the Recycled Water Master Plan.

  c. (Ongoing) Implement capital improvements at ECWRF to increase peak tertiary treatment capacity.

  d. By 2026, partner with Greywater Action, Central Coast Greywater Alliance, or similar organization to determine eligibility criteria for systems that qualify for expedited permitting and provide permitting checklist.

  e. By 2028, explore legal authority for greywater requirements as part of building code for all new construction and major renovations of existing buildings.

  f. By 2028, partner with Marin County, Sonoma County, and other regional agencies to protect local watersheds and Petaluma Marsh.

  g. By 2025, replace existing water meters with Advanced Metering Infrastructure (AMI) system or similar technology that will include easy-to-use web-based tools that allow customers to track and monitor water use. Promote the availability of Home Water Reports and provide materials on how to utilize the available information.

Examples of Funding Opportunities

- State Water Resources Control Board Water Recycling Funding Program and Prop 1

funding.
- BayREN Water Upgrades Save
- Explore WaterSMART water and energy efficiency grants.
- Continue DWR multi-benefit drought relief program.
- Explore Water fees to fund wastewater and water infrastructure programs.
- Water fees from Petaluma Groundwater Sustainability Agency (GSA) pay into supporting GSA, which helps sustainably manage ground water in Petaluma basin long term. Fees fluctuate depending on the year depending on how much water is pumped.

Resource Consumption Action Plan

Petalumans consume many goods and services that originate inside and outside the City of Petaluma, including food; clothing; vehicles; furniture; pharmaceuticals; cosmetics; packaging; electronics; entertainment; software; hardware; transportation services; building materials; tools; and short-lived and single-use plastic and paper commodities by the ton – many of which are ever more difficult to recycle and/or compost. The extraction, processing, transport, distribution, sales, marketing, and disposal of these products represent the city's largest source of consumption-based greenhouse gas emissions. The more goods people in Petaluma buy and the greater their relative emissions (i.e., the emissions resulting from their manufacture, transport, use, and disposal), the greater the adverse effects of those expenditures.

The Resource Consumption Plan aims to reduce overall resource demand, shift demand to lower-resource alternatives, and lower the material inputs for resources consumed. This plan couples' traditional municipal roles like solid waste diversion with emerging roles like facilitating a sharing economy.

This section includes three strategies focused on:

- Solid Waste Diversion
- Local Food and Grocery
- Goods and Services

Additional actions to reduce resource consumption are included in the Buildings and Transportation and Land Use Action Plans.

Solid Waste Diversion Strategy

Intent: The City continues to divert organics from landfill in accordance with State targets and reduces greenhouse gas emissions related to landfilled waste.

This strategy aims to establish compliance pathways and enforcement mechanisms for compliance with SB 1383 organics and food waste diversion and reduce emissions related to other landfilled waste. By consuming less materials, recycling, and composting more, Petaluma will be able to reduce the amount of waste sent to landfill and be on the path to becoming a zero-waste city. This reduces consumption emissions associated with the life cycle of new goods and from the process of disposing items in the landfill.

Diverting organic material including food waste is a crucial step to meeting long-term goals because organic materials produce methane, which is a more potent GHG than carbon dioxide. The State adopted Senate Bill 1383, the Short-Lived Climate Pollutants Act, which requires jurisdictions to divert 75% of organic materials like food, wood, and yard debris from landfills by 2025. Jurisdictions must also increase by 20% the amount of edible food that can be donated to feed people by 2025. Moreover, organics recycling can provide useful byproducts including compost and biogas, which can further reduce emissions and provide economic benefits. Using compost on working lands and lands managed by the

City has been shown to be a low cost, multi-benefit climate solution that creates healthy soils that actively draw down climate emissions.[41]

Equity Considerations

SB 1383 was not only designed to reduce the short-lived climate pollutants associated with organic waste in landfills but helps to address the amount of food waste and food insecurity. Food recovery, where generators of edible food are connected with organizations who supply food to those who are food insecure, is prioritized. Additionally, resources including technical assistance should be prioritized for small businesses and low-income housing within the city to reduce the burden of implementation costs. Similarly, requirements should be phased in from 2022-2025 to allow businesses with fewer resources more time to achieve compliance.

Performance and Equity Targets

- Tons of waste sent to landfill
- Pounds of edible food recovered and redistributed
- Recycling diversion rate
- Number of multifamily units in multifamily structures with access to composting service
- Tons of compost spread on Petaluma's working lands.

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$$	Food justice	Public Works, Parks and Recreation, Community Development, City Manager

Cornerstone Actions
- **SWD-1: Food waste and special event permitting.** Update the special event permitting process to include zero waste requirements for events, such as requiring applicants to submit a "waste plan" for each event (Ongoing).
- **SWD-2: Food recovery program.** By 2026, partner with Recology and Zero Waste Sonoma JPA to implement and enforce an edible food recovery program for commercial food uses, farmers market vendors, and events.
    a. Identify commercial edible food generators that will be required to send surplus food to food recovery organizations.
    b. Conduct focus groups with community-based organizations and religious institutions, such as Una Vida, Daily Acts and Petaluma Bounty in Food Security to assess local food recovery organizations / food banks and pantries' capacity to accept recovered food.

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[41] See Open Space Management Strategy, Climate Smart Working Lands Strategy, and City Landscape Management Strategy for actions related to compost application.

c. Consider implementing a grant program to help organizations build their infrastructure. Prioritize funds for those located in disadvantaged communities.
d. Conduct outreach to educate affected retailers on the requirements.
e. Partner with schools to reduce food waste such as through share tables, no trays, and flexible and right-size ordering.

- **SWD-3: Zero Waste Sonoma model disposable foodware ordinance.** By 2026, adopt the Zero Waste Sonoma model disposable foodware ordinance as amended by Sebastopol and Santa Rosa**.**

Additional Implementation Actions

- **SWD-4: Zero Waste Resolution.** Implement the Zero Waste Resolution actions.
- **SWD-5: Enclosure standards.** By 2026, update enclosure standards for new construction to provide space for three streams in low-rise multifamily residential, high-rise multifamily residential, and nonresidential development.
- **SWD-6: Community education and activation.** Utilize the City's membership in the Zero Waste Sonoma JPA to educate the public about how to separate and divert waste, as well as the associated environmental and community benefits.
  a. Partner with Zero Waste Sonoma JPA to:
      i. Identify contaminated waste generators in need of technical assistance.
      ii. Develop and distribute educational materials (such as the Sonoma Zero Waste Guide) and in-person assistance.
      iii. Coordinate local participation in food recovery and distribution program.
      iv. Promote the use of compost for backyard gardens for small-scale food production and carbon sequestration.
  b. By 2025, partner with local organizations to have volunteers lead sessions in their neighborhood on correct residential waste sorting.
  c. Develop partnerships with local business organizations such as the Downtown Association to ensure local businesses understand and comply with waste diversion requirements.
- **SWD-7: Franchise agreement.** By 2028, include provisions in an amended or new franchise agreement which accomplishes the following:
  a. (Ongoing) continue to fuel trash trucks with biogas generated by the City's wastewater treatment plant.
  b. Research local disposal facility diversion rates to determine potential for additional diversion.
  c. Provide quarterly route reviews to identify prohibited contaminants potentially found in containers that are collected along route.
  d. Clearly label all new containers indicating which materials are accepted in each container, and by January 1, 2025, place or replace labels on all containers.
  e. Increase education and establish penalties for noncompliance with source separation requirements.
  f. Review franchise agreement at regular intervals and include any new or relevant waste reduction and efficiency programs or stipulations in updated agreement.

g. By 2027, explore modifying waste rate structure to encourage collection efficiency and reduce the number of hauler pick-ups before the Recology franchise agreement expires December 31, 2027.

- **SWD-8: Construction and Demolition Ordinance**. By 2026, consider adopting the Model Construction and Demolition Ordinance adopted by the Zero Waste Sonoma Board. Use Zero Waste Sonoma's Green Halo platform to track C&D waste.
- **SWD-9: Reusables.** By 2027, encourage use of reusables at restaurants, food trucks, coffee shops, and at events through a customer Bring Your Own model, or support for reusable plates, cups, containers at city-hosted events.
- **SWD-10: Single use plastics ordinance.** By 2028, establish local ordinance prohibiting single use plastics (including water bottles) at City facilities and events, private events, and vending machines.
- **SWD-11: Waste exchange program.** Work with local businesses and industries to create a waste exchange system for items that typically end up in the waste stream. Conduct a waste stream mapping exercise with large businesses to find reuse/repurpose opportunities and identify partners who will purchase or receive (as donation) salvaged materials, furniture, and equipment from renovated buildings.

Examples of Funding Opportunities
- CalRecycle SB 1383 Local Assistance Grant Program
- CalRecycle Greenhouse Gas Reduction Loan Program
- Franchise Fees

Local Food System and Grocery Strategy

Intent: The City reduces consumption-based emissions, supports grocers in reducing emissions, and supports local farmers and distributors by purchasing of local food and making food system operations more efficient.

Food consumption emissions represent one of the largest categories of household emissions in the consumption-based inventory. Food production, disposal, transportation, packaging, and kitchens, amongst other sources all contribute to the food system emissions. While many of those emissions are outside of the City's jurisdictional control, the City, businesses, and every Petalumans has a role in their reduction.

Procuring local food reduces the upstream emissions from food production, distribution, and waste. This includes emissions from transportation, refrigeration, and even more high-level factors like land use change from natural to agricultural. One way individuals can reduce these indirect emissions is by modifying their purchasing behaviors, such as buying locally grown produce at a farmer's market instead of produce from another country in the supermarket. This strategy leverages the buying power of the City to demonstrate the importance of buying local food and supporting Petaluma's farmers and other producers. It also includes ways that the City can encourage residents and businesses to change their habits related to diet and operations through partnerships with local organizations and an educational campaign.

The City will have to develop the policies and programs in this action plan based on an analysis of Petaluma's local food system and feedback from farmers, regional agricultural agencies, and other stakeholders including restaurants and retail establishments. The USDA suggests that a fluid approach is helpful, depending on the seasons, the availability of certain kinds of products, and needs for special events.

Likewise, a large and often overlooked source of GHG emissions is fugitive releases of HFC's in use throughout the city in food retail refrigeration systems. Grocery stores in the US leak an average of 25% of their refrigerant annually, resulting in a significant amount of GHGs released annually. The Market Zero project, undertaken by ProspectSV and Whole Foods Market, and with sponsorship dollars from the California Energy Commission, piloted reductions from HFCs and is an opportunity for the City to continue to lead.

Equity Considerations

Purchasing local food will translate into increased sales and revenue for Petaluma's farmers and local businesses. In relation to equity, this supports farmworkers who may have low incomes, lack access to health insurance, be immigrants, and/or identify as Latinx. According to 2020 ACS 5-Year Estimates, an

estimated 283 Petalumans are employed in the agriculture, forestry, fishing and hunting industry.[42] There are also Petalumans employed in food manufacturing using local products.

Through procurement processes the City can also make an effort to buy from women-owned and/or BIPOC farmers and entrepreneurs. Institutional investments into local businesses can help the sector grow and provide more jobs to diverse community members.

Performance and Equity Metrics

- Number of local farmers and distributors on the City's "Climate First" procurement list
- Number of City functions supplied with local food
- Number of permanent or pop-up local food dining hubs
- Number of refrigeration audits

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Low	$	Resilience, groundwater recharge, ecosystem health	Climate Action Manager

Implementation Actions

- **LFSG-1. Municipal food procurement policy.** By 2026, develop and adopt "Climate First" municipal food procurement policies that support local farmers and distributors in the Sustainable Purchasing Policy Addendum of the City of Petaluma Procurement Guide.
    a. Examine existing policies developed by the Center for Good Food Purchasing to include treatment of workers, humane treatment of animals, use of healthy, regenerative soil management, and reduction of pesticides and herbicide use.
    b. Develop a vendor checklist for vendors to check their compliance with City policies.
    c. Develop an approved list of vendors and suppliers that City staff can buy from, which can be added to over time.
    d. Develop a data collection tool to track the City's local food procurement over time.
    e. By 2026, partner with Sonoma County Food System Alliance, Agricultural Institute of Marin, Center for Good Food Purchasing, and Petaluma Bounty on the development of the local food procurement policy (City Implementation Action 2) and outreach to the agricultural community, such as focus groups with local farmers and distributors.
- **LFSG-2. Food labeling and disclosure advocacy.** By 2027, consider partnering with the Sonoma County Food System Alliance and other groups to advocate at the appropriate government level for labeling of goods and services to identify local goods and disclose lifecycle climate impacts that can inform purchase decisions.
- **LFSG-3. Food growing and consumption rules.**
    a. By 2026, modify the Zoning Code to allow the creation of more permanent or pop-up neighborhood outdoor dining areas as hubs for locally grown food.

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[42] US Census Bureau. ACS 2020 5-Year Estimates. Table S2404: Industry by Sex for the Full-Time, Year Round Civilian Employed Population 16 Years and Over. https://data.census.gov/cedsci/table?q=petaluma&t=Industry&tid=ACSST5Y2020.S2404

b. By 2027, develop a strategy to remove the barriers (in right-of-way regulations and/or zoning) to food forests on planting strips and other sites.

- **LFSG-4. Community outreach campaign related to food emissions.** By 2028, develop a local food-focused community outreach campaign shared through the City's social media and Climate Ready 2030 webpage, community events, and community partners such as Cool Petaluma.
    a. Develop educational materials to post or distribute at community events that inform members of the public about the benefits of consuming local food.
    b. Post information on City communication channels to encourage Petalumans to reduce high-GHG food consumption. This can include posting meatless recipes on City social media, creating a "meatless Monday challenge," and posting educational information about health and climate benefits of reduced animal product consumption, as well as educating consumers on lower-impact options for popular products such as carbonated water beverages.
    c. Partner with groups (such as the Downtown Association, Cool Petaluma, Petaluma City Schools, and others) to encourage local restaurants, catering companies, and school and workplace cafeterias to increase menu offerings with less meat and dairy.
    d. Partner with farmer's markets to ensure they are offering the Market Match program which allows CalFresh users to double their benefit when buying produce at a farmer's market. Promote the program on the City website, on social media, in the community, and at all farmer's markets.
- **LFSG-5. Business information campaign to reduce food emissions.** By 2027, develop a business-oriented education campaign to promote ways to reduce food-related emissions including Zero Waste Sonoma and Sonoma Food Runners food recovery and recycling programs, refrigeration audits and retrofits and refrigerant alternatives, information about local producers, and electrification options and incentives for commercial kitchens.
- **LFSG-6. Demonstration and pilot projects.**
    a. By 2027, create a demonstration food forest at a City park where appropriate.
    b. By 2028, partner with BayREN to establish a pilot program to reduce refrigeration-related emissions by providing free audits and retrofits to food retail establishments and restaurants. Consider onsite solar and battery storage and/or microgrid opportunities in case of outages.
    c. By 2028, partner with Cool Blocks to carry out volunteer events/demonstrations to plant food forests on planting strips in multiple neighborhoods, with a priority on DAC tracts
- **LFSG-7. Partnership to promote regenerative agriculture.** By 2027, partner with Sonoma County Food System Alliance to promote regenerative agriculture concepts to local farmers and producers.

For implementation actions related to building electrification, see the Existing Buildings Action Plan.

Examples of Funding Opportunities
- CalRecycle Grants
- SCP and BayREN incentives
- USDA Food Recovery Grants

Goods and Services Strategy

Intent: Petalumans purchase goods and services wisely and rethink the concept of disposability to reduce consumption emissions.

Individuals, households, and cities do not have enough power to change the entire global economy which results in consumption emissions. However, because there is no global, national, or even local system to track consumption emissions, it can be difficult for consumers to make informed choices about the emissions embedded in products they buy.

This strategy aims to encourage behavior change around purchasing and waste through education, highlighting local businesses and products, and partnerships and/or lobbying with other local agencies. It also focuses on expanding opportunities to reuse, fix, and share goods instead of disposing of them. This reduces the need to purchase new items and reduces the amount of trash that ends up producing methane in the landfill. Lastly, the City can advocate for laws requiring producers to be transparent about their products' emissions.

Equity Considerations

Messaging about consumption emissions tends to focus on consuming less, but many households struggle to meet their basic needs due to income or other reasons. Therefore, it is necessary to encourage community members to aim for a level of consumption that is socially just and environmentally safe. Cultivating a sharing economy among community members can foster a spirit of helping and supporting others. Though the intent is that Petalumans of all income levels participate, this approach can benefit low-income households who cannot always afford to buy new items.

Performance and Equity Targets

- Number of local businesses participating in local goods incentive programs and/or received green certification "badges"
- Number of local businesses participating in reusable packaging incentive program

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$	Resilience, air quality, public health	City Manager, Communications, Economic Development

Cornerstone Actions
- **GS-1: Climate awareness and action program.** By 2026, implement a robust, ongoing climate awareness and action program, focused on reduction of consumption-based emissions by residents, businesses, and contractors through educational events, media outreach, and other creative approaches. Components include:
  - a. Encouraging Petalumans to estimate their carbon footprint on a web-based calculator.[43]
  - b. Highlighting a sustainable local business in every City newsletter.

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[43] For example, the CoolClimateNetwork Calculator https://coolclimate.berkeley.edu/calculator

c. Exploring the possibility of creating special green certification "badges" (for businesses to signal they use salvaged or reused materials, refillable packaging, are all electric, etc.), and/or a "Circular Economy Opportunity Zone" incentive program for businesses that produce goods locally and with local materials. These measures can be implemented as an expansion of the existing Shop Petaluma program.

d. Partnering with Cool Petaluma volunteers to conduct the community surveys needed to estimate consumption emissions.

e. Providing information about sustainable local businesses and other consumption-related topics at relevant City counters and offices, such as the Planning and Economic Development.

f. Partnering with an organization (such as the Downtown Association and/or Crafterino) to host a yearly "Tiny Footprint Festival" to showcase local goods and craftspeople.

g. Partnering with other agencies to offer trainings for landscape contractors on using low carbon materials and electric equipment.

h. Creating a module on the City's Climate Ready 2030 webpage that highlights resources (i.e., local "buy nothing" groups, thrift stores, donation centers, etc.) and local businesses to help Petalumans reuse.

Additional Implementation Actions

- **GS-2: Study most impactful goods and services.** By 2026, conduct a study to understand the most impactful goods and services to reduce greenhouse gas emissions and publish publicly. The study shall include analysis of the local waste stream, exploration of how to track and reduce microplastics, and analysis of the services used most by residents (childcare, landscaping, mail, etc.).

- **GS-3. Greenhouse gas labeling and disclosure advocacy.** By 2025, advocate for more robust extended producer responsibility policies and GHG content labelling statewide in partnership with Zero Waste Sonoma Joint Powers Authority.

- **GS-4: Behavioral change and the disposability of goods.** By 2027, implement measures to cultivate behavior change around the disposability of goods.
    a. Modify City procurement rules to more heavily weight proposals that include returnable/reusable packaging instead of plastic in competitive processes. Notify all current suppliers of the preference for returnable/reusable packaging instead of plastic.
    b. Conduct a study of repair/reuse/share businesses in Petaluma. Identify and implement strategies to support business retention and growth, with a focus on BIPOC-owned businesses.
    c. Remove the barriers (in right-of-way regulations and/or zoning) to neighborhood projects that reduce the production and consumption of goods, including little libraries, repair clinics, and yard sales/exchanges.
    d. Require local food businesses use reusable and/or compostable uncoated paper/bio-based packaging for take-away operations.

- **GS-5: Local sharing economy.** Partner with other agencies and local organizations to build up participation in the local sharing economy, repairing, and secondhand goods. Promote resources on the City social media platforms and website.

	a. Partner with the Sonoma County Library system to expand their existing lending library offerings (tools, seeds, etc.) and 3D printing resources. Publicize the libraries' services on City social media platforms and website.
	b. Create neighborhood hubs where tools and other larger items can be shared and/or exchanged. Explore options to deliver items that are too large to pick up.
	c. Partner with an organization to host recurring Repair Fairs and workshops for the community to encourage reuse as a low-emission alternative to purchasing new goods.
	d. Identify and support programs and institutes that train people to fix items.

Examples of Funding Opportunities
- Philanthropy
- CalRecycle Grants

Natural Systems and Sequestration Action Plan

Petaluma's natural lands sequester carbon in the soil and plants, which absorb carbon dioxide in the atmosphere and store it as organic carbon through photosynthesis.[44] Climate change impacts such as extreme heat, drought, and wildfires degrade the health of those natural systems, which unfortunately impact landscapes' ability to sequester carbon. Healthy landscapes are also important to protect biodiversity and ecological connection, improve water quality, and improve public health by improving access to quality green space.

To meet the goal of carbon neutrality by 2030, the City must manage its parks and other open spaces in ways that support healthy soils and foster plants that can thrive in Petaluma as the climate changes. This will ensure that Petaluma's landscapes continue to reduce rather than emit GHGs. This section includes four action plans including:

- Urban Forestry
- Open Space Management
- Climate Smart Working Lands
- City Landscape Management Action Plan.

Urban Forestry Strategy

Intent: Tree canopy coverage is increased by growing and maintaining the urban forest across all neighborhoods, particularly in disadvantaged communities.

Carbon sequestration is the long-term removal of carbon dioxide from the atmosphere into the earth's natural systems including trees, grasses, soils, and riparian areas, thereby slowing the accumulation of GHGs in the atmosphere. Carbon sequestration through the enhancement of natural systems provides many quality-of-life and resiliency co-benefits in addition to emissions reductions. For example, expanding the urban forest can help mitigate the urban heat island effect, improve air quality, provide traffic calming, and reduce energy use.

Equity Considerations

Historic patterns have resulted in an inequitable distribution of tree canopy between high-resource communities and disadvantaged communities. Increasing tree canopy in disadvantaged communities creates benefits such as cooling, air quality improvements, and increased public safety. Together these factors also support active transportation by making it more comfortable to walk and, wait for the bus or bike to a destination. This especially helps households without vehicles, youth, and older adults who can be more severely impacted by heat while travelling.

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[44] CA Natural Resources Agency. 2022. Natural and Working Lands Climate Smart Strategy. https://resources.ca.gov/-/media/CNRA-Website/Files/Initiatives/Expanding-Nature-Based-Solutions/CNRA-Report-2022---Final_Accessible.pdf

Performance and Equity Metrics

- Increase in tree canopy cover percentage in publicly accessible landscaped areas, rights-of-way, and private development
- Canopy coverage increase in disadvantaged communities
- Number of street trees
- Square feet of pavement removed and converted to landscaping/trees
- Reduction in isolated tree communities

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$$	Air quality, public health, groundwater filtration, biodiversity, reduce urban heat island effect	Public Works, Parks and Recreation, and Community Development

Cornerstone Actions

- **UF-1: Petaluma Urban Forestry Management Plan.** By 2026, develop and adopt a Petaluma Urban Forestry Management Plan in partnership with community organizations.
    a. Conduct an inventory of existing trees in Petaluma.
    b. Establish a citywide minimum tree canopy cover goal.
    c. Establish minimum tree canopy cover goals for specific land use types and scales:
        I. Landscaped spaces
        II. Streets / ROW
        III. New development (building parcel) – commercial and residential
    d. Establish a new tree planting goal by 2030.
    e. Identify which DACs to prioritize tree planting efforts.
    f. Develop street / public ROW tree and vegetation design standards.
    g. Develop and promote water-efficient tree irrigation system standards.
    h. Adopt code amendments and update permitting requirements to be consistent with established tree canopy goals for land within the City's jurisdiction.
    i. Establish and fund a citywide street tree maintenance and tree planting program.
    j. Adopt a monitoring system to track tree canopy cover over time.

Additional Implementation Actions

- **UF-2: Community-based tree planting.** (Ongoing) Collaborate with ReLeaf Petaluma to support their 10,000 trees program, including potential fee reductions or water bill credits, if feasible.
    a. Continue hosting an Arbor Day public event or event series to educate Petalumans about tree care, native species, tree benefits, etc.

b. Starting in 2024, partner with community organizations in Petaluma, such as ReLeaf, to coordinate tree planting on land use types where the City does not have jurisdiction (i.e. private property and schools).
c. By 2026, work with Petaluma schools, ReLeaf Petaluma, Cool Petaluma and/or Daily Acts community volunteers to collect place-based data (i.e. observational studies of the shade and trees in public places).
d. By 2026, conduct a map-based survey asking Petalumans what locations they think need more trees.

- **UF-3: Revised Tree Ordinance.** By 2026, adopt a revised Tree Ordinance that prioritizes tree preservation.
- **UF-4: Street trees.**
    a. By 2026, revise tree pruning and clarify and reinforce removal criteria for street trees to minimize the loss of street trees, increases street tree planting opportunities, and improve maintenance of existing trees for long term health of urban canopy.
    b. By 2026, adopt an updated List of Approved Street Trees that prioritizes climate and ecosystem appropriate trees and plants. Consider integrating the ReLeaf Petaluma Plant Palette recommendations.
    c. By 2028, establish a pilot program for water harvesting on streets using curb cutting or other techniques.
- **UF-5: Baseline carbon sequestration.** By 2027, determine baseline data on existing carbon sequestration including Petaluma's share of legacy emissions and consumption emissions.
- **UF-6: Incentives for impervious surface reduction.** By 2027, establish an incentive program to reduce impervious surfaces on private property.
    a. Incentives for low water use, nature-scaping, and large tree planting
    b. Model landscapes to demonstrate principles.

Examples of Funding Opportunities
- CalFire Urban and Community Forestry Grant Program
- CNRA Environmental Enhancement and Mitigation Program
- Bank of America Community Resilience Grant
- CA Transportation Commission ATP (must demonstrate that greening benefits active transportation)
- ReLeaf grants (to community groups only)
- CalEPA Environmental Justice Small Grants Program (non-profits and federally recognized tribes only)

Open Space Management Strategy

Intent: Natural open spaces, landscaped spaces, agricultural areas, and other green spaces are managed in a way that supports biodiversity habitat connectivity and increases carbon sequestration and public access to nature.

Parks, agricultural lands, natural open spaces, and landscaped spaces support biodiversity and serve the community by providing public access, active transportation corridors, recreational, and cultural programs. These may include undeveloped natural areas, community parks, trails, recreation areas, streetscapes, urban forests, and more. These areas provide multiple benefits that support the city towards a more resilient and sustainable future through reducing the urban heat island, improving stormwater runoff, and supporting biodiverse native ecosystems and local community health.

Rebuilding rather than degrading soil organic matter of various land systems (wetland, forest, cropland etc.), can increase soil permeability, aid water-holding capacity while reducing runoff and decrease the expense of dredging the Petaluma River. Additionally, with the state facing future water supply uncertainty, it is imperative that natural open spaces have adequate soil health and ecosystem-appropriate plants to stay alive during harsh conditions.

Equity Considerations

Residents in disadvantaged communities tend to have less access to quality open space. Studies have found a link between lack of access to open space in minority and low-income communities and increased rates of negative health outcomes (chronic disease, respiratory illness, lower life expectancy).[45]

In Petaluma, most neighborhoods are within a 10-minute walk of a park, which is considered high park access. No low-income and/or disadvantaged communities are more than a 20-minute walk to a park.[46] Even so, protecting, expanding, and improving the quality of open space can provide increased opportunities for outdoor exercise, socializing, and other healthy activities. Greenspace can also create a cooling effect, which can make temperatures more comfortable in disadvantaged communities where high amounts of impervious surfaces and lower tree canopy coverage are more common.

Performance and Equity Metrics

- Acres of Petaluma River restored
- Change in biodiversity score from baseline biodiversity assessment
- Tons/cubic yards of compost applied per year
- Population within 10-minute walk of open space

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[45] Yañezm E., Aboelata, M, & Bains, J. (2020). Park Equity, Life Expectancy, and Power Building Research Synopsis. Prevention Institute. https://preventioninstitute.org/sites/default/files/uploads/PI_Park_Equity_Research-Summary_092420_FINAL%20%281%29.pdf

[46] Raimi + Associates. (2021). Existing Conditions Analysis: Health & Environmental Justice.

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$-$$$$	Resilience, air quality, public health, biodiversity	Parks and Recreation, Public Works, Community Development

Cornerstone Actions

- **OSM-1. Local and regional sequestration projects.** By 2026, develop a policy that prioritizes local and regional carbon sequestration partnerships, projects, and sources in the city.
- **OSM-2: Carbon gardening campaign.** By 2026, create or support the creation of a carbon gardening campaign in school yards, community centers, resilience hubs, and neighborhoods that is widely engaging and highlights its multiple benefits: sequestration, consumption, food, biodiversity, water, health, cost savings, economic recovery and growth, resiliency, climate justice and equity.
- **OSM-3: Integrated Pest Management Plan for HOAs.** By 2026, require new developments to create an Integrated Pest Management Plan and provide templates for HOAs and the public.
- **OSM-4: Natural Open Space Management framework.** By 2027, develop and adopt a Natural Open Space Management framework as part of a comprehensive update to the Petaluma River Plan with policies to enhance wildlife corridors and increase carbon sequestration, biodiversity, and public access for different typologies of natural open space.
    - a. Riparian Area / Tidal Marsh: Establish a target length of riverbanks to restore, re-creating a healthy and accessible waterway and pedestrian-oriented zone along the banks. Address upper watershed impacts, improve water quality and quantity, control erosion, and stabilize banks. Restore floodplains and historic floodplain ecosystem services in the Petaluma valley and hills.
        - i. Facilitate the removal of existing and transfer of future development away from the wetlands and tidal marsh by expanding the scope of the repetitive loss property acquisition program. Add criteria to the program to consider properties identified within flood zones per the City's updated flood hazard maps with future sea level rise and sites with high ecological resilience value.
        - ii. Amend the Implementing Zoning Ordinance to include landscape design, hardscape, soil, and stormwater management standards for building setbacks and any areas of public access to improve riparian habitat and allow room for nature-based responses to high-intensity storm surges and sea level rise.
    - b. Private Property
        - i. Encourage backyard edible gardens and the implementation of regenerative agriculture practices.
        - ii. Create landscape design, hardscape, soil, and stormwater management standards.
        - iii. Adopt a drought tolerant, ecosystem-appropriate plant palette including native plants and long-lived native bunch grasses in landscapes to increase soil development and carbon sequestration.

  c. Schools

    i. Assess the amount and quality of schools' natural open spaces and landscape areas. Identify schools in DACs that should be prioritized for greening projects.

    ii. Partner with the school district to advocate for CA DGS to establish landscape design, hardscape, soil, and stormwater management standards, and plant palettes that prioritize carbon sequestration.

  d. Golf courses

    i. Create landscape design, hardscape, soil, stormwater management standards, and plant palettes that prioritize carbon sequestration.

    ii. Encourage local golf courses to adopt and implement practices necessary to become a certified as an Audubon Cooperative Sanctuary Program for Golf

    iii. Update Conditional Use Permit conditions for new Golf Course/Country Club uses to comply with new requirements and include updated standards in lease renewals where possible.

  e. City parks, sites, and Landscape Assessment Districts – see the Municipal Action Plan.

    i. Inventory and map wildlife areas & populations.

    ii. Protect and restore existing undeveloped areas (e.g., by creating a community land trust).

Additional Implementation Actions

- OSM-5: By 2025, identify priority natural open space areas and develop a program with a code of care of natural open space.

  a. (Ongoing) Maintain the 200' setback from the centerline of the Petaluma River in the General Plan.

  b. (Ongoing) Explore opportunities for property acquisition and relocation sites for businesses in the floodplain and for repetitive loss areas of the 100-year floodplain consistent with the LHMP.

  c. By 2026, work with local and regional environmental partners to create a biodiversity assessment and accountability tool, for example, a "Biodiversity Scorecard" or other means, to measure progress restoring and enhancing wildlife populations and native plant habitat for the city.

  d. Map current wildlife habitat connectivity within the city and develop a strategy to improve.

  e. By 2027, update ministerial and SPAR landscape plan requirements to reflect new Natural Open Space Management framework.

  f. Starting in 2028, explore opportunities to partner with or establish a local land trust to acquire properties or easements along the Petaluma River banks to restore and include them as projects in the CIP.

  g. Promote a community compost and mulch pick-up program for regional compost.

  h. By 2026, promote CA Audubon Bird-friendly Communities resources and National Wildlife Federation Certified Wildlife Habitat Garden program.

  i. By 2026, promote resources from Sonoma County Master Gardeners on the City website and social media.

j. By 2026, partner with local community gardens to host open houses / garden demonstration events.   k. By 2026, partner with local food and urban agriculture organizations such as Petaluma Bounty to promote gardening and establish a community seed library.   l. By 2026, establish a booth at farmers markets that contain educational material about local community gardens and backyard gardening.   m. By 2026, host yearly events in partnership with local landscaping/agricultural supply businesses with free or discounted seeds, fruit and vegetable starts, fruit trees, and compost.   n. By 2026, support Zero Waste Sonoma's efforts to establish local composting and mulch facilities.   o. By 2027, partner with Friends of the Petaluma River and/or the Petaluma River Park Foundation on river education efforts and property acquisitions.   p. By 2027, partner with Petaluma Wetlands Alliance, Point Blue Conservation Science, and local schools and universities to create the biodiversity index, conduct education in schools, and participate in other community outreach efforts.
Examples of Funding Opportunities   - California Coastal Commission (land acquisition)   - Sonoma County Ag + Open Space Special District Matching Grant Program   - CA Wildlife Conservation Board grants   ○ Riparian Habitat Conservation Program   ○ Habitat Enhancement and Restoration   ○ Climate Adaptation and Resiliency   - CNRA Environmental Enhancement and Mitigation Program   - CA DWR Urban Stream Restoration Grants   - CA Transportation Commission ATP (must demonstrate that greening benefits active transportation)   - Philanthropy

Climate Smart Working Lands Strategy

Intent: Local working lands become a sink for carbon sequestration

Agriculture is an important part of Petaluma's heritage. Today, there are about 200 acres of agricultural land in the city. Some of this land is suitable for City-facilitated demonstration or pilot program partnerships. With the implementation of regenerative practices, agricultural lands can help sequester carbon in addition to being the source of healthy local food. Practices such as compost application and cover cropping can benefit the farm by keeping weeds down and attracting pollinators.

Equity Considerations

Small agricultural operations typically have lean profit margins compared to large-scale farming. All programs should prioritize accessibility for small farmers, farmers just starting out in the industry, and BIPOC farmers.

Performance and Equity Measures

- Area of active agricultural land
- Number of on-farm carbon sequestration projects completed
- Change in landscape and soil carbon

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$	Resilience, air quality, public health, biodiversity	Community Development Department

Implementation Actions
- **CSWL-1: Local sequester program partnership.** Starting in 2027, partner with Sonoma County Agricultural Preservation and Open Space District, and Resource Conservation Districts to conduct focus groups with local farmers and agricultural landowners to participate in and deploy capital generated by a Sonoma County Sequester Local program.
- **CSWL-2: Local Agricultural/Working Lands strategy.** By 2028, develop a Local Agricultural/Working Lands strategy that is consistent with the Sonoma County Ag + Open Space Vital Lands Initiative and considers a suite of options such as:
    a. Support Sonoma County Ag + Open Space and other nonprofits' efforts to protect agricultural land through conservation easements and other financial incentives.
    b. Explore the feasibility of creating a city-wide Purchase of Agricultural Conservation Easement (PACE) program.

      c.   Explore the feasibility of creating a City funding program to incentivize and support farmers who implement healthy soils/climate smart practices. Prioritize BIPOC farmers, small farmers, and new farmers.

      d.   Secure access to compost and other materials (i.e., cover crop seeds) for farmers.

           i.   Align local regulations to statewide streamlining permitting efforts for on-farm composting.

           ii.   Explore bulk purchasing to sell to farmers at reduced rates.

      e.   Establish partnerships and connections between farmers and resources.

           iii.   Connect farmers to technical assistance from the County Farm Bureau, Ag, Weights & Measures, and UC Cooperative Extension program.

           iv.   Encourage farmers to apply for CFDA Healthy Soils grants and connect them to technical assistance resources.

           v.   Connect farmers and landowners with Sonoma Land Trust and Sonoma County Ag + Open Space to pursue the establishment of conservation easements or facilitate sale or donation of land if desired.

           vi.   Utilize Daily Acts to promote land stewardship efforts and opportunities.

- **CSWL-3: Farm carbon sequestration pilot.** By 2028, conduct an on-farm carbon sequestration pilot / demonstration project.
- **CSWL-4: Sequestration tracking tool.** By 2028, develop or utilize an existing tool to track the number of sequestration projects and changes in landscape and soil carbon.
- **CSWL-5: Zero Foodprint partnership.** Partner with Zero Foodprint to help fund the spread of compost on working lands.

Examples of Funding Opportunities

- SGC SALC Planning Grants
- Sonoma County Agricultural Preservation and Open Space District Matching Grant Program
- SGC SALC Agricultural Conservation Easement Grants
- DOC California Farmland Conservancy Program
- Explore establishing lighting and landscape assessment districts (LLADs)
- Zero Foodprint

City Landscape Management Strategy

Intent: The City increases landscape carbon sequestration and soil quality at City parks and other open spaces.

The City of Petaluma Parks and Recreation Department maintains hundreds of acres of open space, playing fields, landscape assessment districts, and facilities. Implementing regenerative land management practices like compost application and replacing turf grass with native grasses sequesters carbon in the soil and vegetation. They can also improve the ecological health of the open space due to enhanced biodiversity and better soil health/water retention.

This strategy also includes actions to increase community gardens on City land. Even at a small scale, regenerative agriculture practices sequester carbon and have other co-benefits like reducing the need for pesticides and attracting pollinators.

Equity Considerations

Actions to increase carbon sequestration create positive community benefits such as more access to quality green space and better air and water quality. This is especially beneficial in DACs which historically have less greenspace, reduced tree canopy, lower air quality, and lack of access to healthy food.

Performance and Equity Metrics

- Acres of land with compost application
- Acre feet of water (potable and/or recycled) used on landscaping per year
- Acres of new community gardens, including those within disadvantaged communities
- Number of landscaping upgrades completed
- Number of onsite water reuse systems installed

GHG Reduction Potential	Cost	Co-Benefits	Responsible Departments
Medium	$-$$	Resilience, groundwater recharge, ecosystem health	Parks and Recreation, Public Works

Cornerstone Actions
- **CLM-1: City Integrated Pest Management Plan.** By 2025, implement the updated Integrated Pest Management Plan to eliminate the use of toxic and polluting herbicides, pesticides, and fertilizers on City-owned property.
- **CLM-2: Comprehensive Land Management Plan.** By 2026, adopt a comprehensive Land Management Plan and maintenance procedures for City properties that center regenerative practices.

a. Engage with ecologists and soil scientists in the development of the Land Management Plan and regenerative maintenance procedures.
b. Establish a threshold and implementation measures to increase soil organic matter on City Parks and other open spaces at City facilities by a certain percentage determined feasible by soil scientists and other experts.
   i. Estimate baseline landscape carbon sequestered at City Parks and other open spaces at City facilities.
   ii. Identify open spaces in the City's portfolio that are suitable for compost application.
   iii. Identify sources of compost: identify existing suppliers, explore opportunities to produce compost as part of City operations (i.e. composting the digestate left over from the anaerobic digestion process at ECWRF), and establishing Community Compost Hubs.[47]
   iv. Create landscape design, hardscape, soil, and stormwater management standards that promote sequestration.
   v. Adopt a drought-tolerant, fire resistant, ecosystem appropriate plant palette that prioritizes sequestration (i.e. native grasses, shrubs and woody vegetation).
   vi. Continue employing livestock to conduct holistic grazing.
c. Reduce water use on City facility landscaping, parks, and natural open spaces.
   i. Identify opportunities to install rainwater capture systems (i.e., rain barrels, cisterns, etc.).
   ii. Explore options to increase the use of recycled water for landscape irrigation.
d. Increase community gardens/urban farm parks.
   i. Identify vacant or underutilized City-owned land that can be converted to community gardens.
   ii. Develop community gardens throughout the city, especially near existing and future low- and moderate-income residences.
   iii. Consider any required zoning amendments needed to allow community gardens, community food waste drop-offs, and/or community composting sites.
   iv. Continuously monitor opportunities to purchase private lands to add to the City's parks or other open space to increase sequestration and may have the co-benefit of increasing habitat connectivity.
   v. Consider including an Adopt-A-Park program for ongoing management.
- **CLM-3: Natural systems policy.** By 2026, develop a natural systems policy that prioritizes nature-based systems and natural systems in capital improvements, planning, and programs.

Additional Implementation Actions
- **CLM-4: Landscaping water audits.** (On going) Audit water consumption at municipal facilities and parks to identify opportunities to reduce water usage.
- **CLM-5: Compost application and monitoring.**

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[47] See LA Compost Community Compost Hubs and farmer's market compost drop-off as example programs
https://www.lacompost.org/start-composting

	a. By 2027, conduct a decompaction and compost application demonstration project on City-owned land and track changes in soil carbon and amount of water retained. b. By 2027, establish a monitoring system to track compost and mulch application and soil organic material measurements over time. c. Include educational signage at sites with compost application and recycled water in use to teach the public about the possibilities and benefits of compost application, healthy soils, and water recycling d. Hold workshops and on-site demonstrations to educate community members about regenerative practices implemented on City lands such as no/less till, cover-cropping, and compost application. • **CLM-6: Model landscape gardens.** By 2028, develop one or more "model landscape" gardens on City parks or other City open spaces that illustrate the principles of the Land Management Plan for the community. • **CLM-7: Plant walks.** Partner with ReLeaf Petaluma, Cool Petaluma, or other organizations to host neighborhood "plant walks" to educate community members on native plants.
Examples of Funding Opportunities	
• DWR Urban Stream Restoration Program • WCB Climate Adaptation and Resiliency grant	

Chapter 6: Blueprint Implementation

This chapter outlines how the City can implement the Blueprint. It provides information about potential funding and financing mechanisms and a framework for the City to implement, monitor, evaluate, and update the Blueprint.

Funding and Financing Strategy

Some Blueprint actions will pay for themselves, but many will result in new costs or will require upfront funding which disadvantaged communities may not be able to afford. Sustainable funding sources must be developed to fund participation in measures needed most by disadvantaged communities. For action to be effective, to the extent the information available, decision-makers, including the City Council and individual households, must evaluate and balance the cost of implementation with potential cost savings and the avoided costs of inaction.

A combination of funding sources will be necessary to fund the programs called for in the GHG reduction measures and actions. The funding and financing strategy identifies major categories of private and public funding sources and their application to the types of programs, policies, and capital improvements called for in the Blueprint. As described in this chapter and Chapter 5: GHG Emissions Reductions Measures, these fall into the following main categories:

- Building energy efficiency and decarbonization
- Clean energy generation
- VMT reduction
- Vehicle electrification
- Water efficiency
- Waste diversion and source reduction
- Sequestration
- City staffing
- City facilities and assets

Table 5. Summary of Funding Sources

Source	Category	Building Energy Efficiency and Decarbonization	Clean Energy Generation	VMT Reduction	Vehicle Electrification	Water Efficiency	Waste Diversion and Reduction	Sequestration	City Staffing	City Facilities and Assets
General Fund	City Resource	X	X	X	X	X	X	X	X	X
Capital Projects Fund	City Resource		X	X	X	X				X
Taxes, including Measure U	City Resource	X	X	X	X	X	X	X	X	X
Bonds	City Resource		X	X	X	X	X	X		
Internal Service Funds	City Resource								X	X
Utility Funds	City Resource					X				
Assessment District[1]	District-Based	X	X	X	X	X	X	X	X	X
Utility Rebates, Grants, and Incentive Programs	Grants and Incentives	X	X			X				X
Federal, State, Regional, and County Grants and Partnerships	Grants and Incentives	X	X	X	X		X	X		
Development Impact Fees, In-Lieu Fees, and Related City Funds	Developer Contribution			X				X		
Philanthropy	Private Donation						X	X		

1. See notes on SB 852 regarding Climate Resilience District

Below is a list of potential funding sources as well as available incentive programs to help reduce the cost of implementing Blueprint actions:

- **City's General Fund:** This is the primary source of funding for City operations and can be used for any public purpose. It is allocated as part of the overall City budget, approved by City Council. The large number of competing priorities for General Fund dollars requires that the City seek out other sources of funding wherever possible to increase the likelihood of successful implementation for each action. In Petaluma, the Measure U Sales and Use Tax (approved by voters in 2020) contributes to the General Fund but is used for deficit elimination, workforce stabilization, infrastructure, and community priority initiatives.
- **Bonds:** Local governments can sell bonds to investors that raise capital for a specific objective. Bonds must be approved by voter and may have additional oversight or administration requirements.
- **Taxes:** Taxes generate revenue to support local, regional, and state operations. Taxes can be used either for general purposes (e.g., any city service as needed) or specific purposes (e.g., climate change mitigation) but require voter approval. Examples of taxes include:
    - Sales Tax, Measure U
    - Utility User Tax
    - Real Estate Transfer Tax
    - Parcel Tax
- **Utility Funds:** provide for the comprehensive and integrated management of Petaluma's water resources, storm water and the collection and treatment of wastewater.
- **Assessment Districts:** An assessment district enables the City to collect special assessments from property owners for specified improvements, such as improvements to roads or flood control facilities. SB 852 recently created the Climate Resilience Districts Act which also authorizes "counties or special districts, either alone or in combination, establish climate resilience financing districts to undertake projects and programs to address climate change including wildfire, sea level rise, extreme heat and cold, drought, flooding, and related matters."[48]
- **Climate Resilience Districts:** A type of enhanced infrastructure financing district that are limited to funding projects that address sea level rise, extreme heat, extreme cold, and the risk of wildfire, drought, and the risk of flooding.
- **State, Federal, Regional, and County Grants:** Grants are usually given without expectation of repayment, but often require either matching funds from the City and/or staff time to administer the grants. Grants often fund new and innovative programs. However, grants are also competitive and are not guaranteed source of funding. The following agencies offer climate related grants:
    - Inflation Reduction Act
    - Department of Energy
    - California Energy Commission
    - PG&E
    - Bay Area Air Quality Management District
    - Electrify America
    - FTA Planning Grants
    - CARB
    - CalFire
    - FEMA
    - CDFA Healthy Soils Initiative
    - CalRecycle

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[48] https://sd03.senate.ca.gov/news/20220909-governor-signs-sen-dodd%E2%80%99s-climate-resilience-bill

- **Incentives and Rebates**: Incentives and rebates are usually monetary motivators that can help cover the cost of implementing specific programs or equipment. Many utilities have incentive programs to help spur investment, pay for equipment, and expand various markets for newer technologies. Existing programs include:
  - SCP Residential and Commercial Rebates
  - BayREN Home+ Rebates
  - California Water Service rebates
  - CA Clean Vehicle Rebate Project
  - Single-family Solar Affordable Solar Housing (SASH) Program
  - Multifamily Affordable Solar Housing (MASH) Program
  - Residential and Commercial Federal ITC for solar photovoltaics
  - New local incentives programs as needed

Appendix A

Glossary of Terms

Active transportation: This is a non-motorized form of transportation, primarily made up of walking and bicycling.

Activity-based emissions: GHG emissions that are quantified based on activity data (e.g., energy usage) in conjunction with an emission factor (e.g., $MTCO_2e/kWh$).

Adjusted business-as-usual (ABAU) forecast: The influence of federal, statewide, and regional policies (e.g., Pavley Clean Car Standards) will have on the City's projected emissions.

Business-as-usual (BAU) forecast: A GHG emissions scenario that is based on the assumption that no mitigation policies or measures will be implemented beyond those that are already in progress that can serve to highlight the level of emissions that would occur without further policy effort.

CALGreen: The California Green Building Standards Code, Title 24, Part 11, of the California Code of Regulations. It encourages sustainable construction practices in building planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality.

Carbon dioxide equivalent (CO_2e): A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP), or potency. Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2E)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by

the associated GWP. For example, the GWP for methane is 24.5. This means that one million metric tons of methane is equivalent to 24.5 million metric tons of carbon dioxide.[1]

Carbon neutrality: The balance between carbon emissions and carbon absorption from the atmosphere.

Carbon sequestration: The process of capturing and storing carbon dioxide from the atmosphere.

Climate change: Climate change refers to changes in the average and/or the variability of temperature, rainfall, and extreme weather that persist for an extended period

Climate hazard: Short or long-term climate events that have the potential to cause damage or harm to humans and natural systems. These include meteorological, climatological, hydrological, geophysical or biological events.

Co-benefit: Non-greenhouse gas-related benefits of climate actions. Measuring co-benefits examines how climate action is interrelated with and delivers outcomes for provision of basic services, health, prosperity and other sustainable development agendas

Community solar: A solar power project where the energy and benefits of that project go towards multiple energy customers (e.g., individuals, businesses, nonprofits).

Complete neighborhood: A neighborhood where residents can reach community amenities (e.g., grocery stores and retail), public facilities (e.g.,

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[1] U.S. Environmental Protection Agency. Climate Change. https://www.epa.gov/climatechange/glossary.html

parks and community centers) and services (e.g., health care and affordable childcare) within a 15-minute walk

Complete streets policies: Policies that address the safe accommodation of all users, including bicyclists, pedestrians, motorists, freight, public transit vehicles and riders, children, the elderly, and the disabled.

Consumption-based emissions: GHG emissions that account for the direct and indirect emissions resulting from the full lifecycle of a good or service. This includes those from production, pre-purchase transportation, wholesale and retail, use, and post-consumer disposal.[2]

Decarbonization: Process of reducing embodied or operational GHG emissions. Typically refers to a reduction of the carbon emissions associated with energy consumption, industry and transportation. The intention to decarbonize the electric power grid is often referred to as Grid Decarbonization.

Disadvantaged community (DAC): According to California's Health and Safety Code (Section 39711), a disadvantaged community is defined as "a low-income area that is disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation." For the purposes of the Petaluma General Plan Update, "disadvantaged communities" are referred to as "Equity Priority Areas."

Ecosystem services: The benefits that people and society derive from natural ecosystems, such as carbon sequestration, pollination, and stormwater filtration.

Electrification: The process of transitioning away from technologies that use fossil fuels to

technologies that use electricity. Electrification of systems paired with a power grid with 100% renewable energy sources can significantly reduce GHG emissions.

Embodied carbon: (See Consumption-based emissions).

Emissions inventory: A quantified list of a city's GHG emissions and sources.

Energy conservation: Using less energy. Ways to reduce energy waste include turning off lights, heating, and motors when not needed

Energy efficiency: Doing the same or more work with less energy. Ways to increase energy efficiency include replacing incandescent light bulbs with compact fluorescent light bulbs or buying an Energy Star appliance to use less energy for the same or greater output.

Equity: The absence of avoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically or geographically. As opposed to the concept of equality where everyone is given equal access, equity provides proportional access to redress historical and current disparities and ensure the same level of opportunity for all.

Greenhouse gases (GHG): Gases within the atmosphere that accelerate the warming of the Earth and are released from human activities that burn fossil fuels or from historic carbon sinks, such as melting permafrost.

Greywater: The water generated from buildings that is not contaminated (e.g., sinks, dishwashers).

Greywater systems: This system collects domestic, uncontaminated wastewater and

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[2] Urban Sustainability Directors Network. Sustainable Consumption Toolkit. https://sustainableconsumption.usdn.org/initiatives-list/estimating-consumption-related-emissions

reuses it for irrigation or toilet flushing. Sources of greywater include sinks, showers, washing machines, and dishwashers.

Landscaped spaces: Includes planting areas, turf areas, streetscape and landscape zones, and other features on a site. These areas are managed space.

Micromobility: Small, fully motorized or motor-assisted devices such as e-scooters and e-bikes. Includes privately owned and shared-use station-based or dockless fleets.

Mobility hub: A place that connects different travel options including public transit, micromobility, rideshare, and walking.

Mode shift: The transition from using one habitual form of travel, or mode, to another. Transportation modes include mass transit, non-motorized transit and automobiles.

Mode share: A number or percentage of users or trips, using a particular type of transportation such as driving a single-occupancy vehicle, carpooling, riding public transit, walking or cycling.

Natural open space: Areas of open space in a natural state with a minimum amount of maintenance.

Pacific Gas and Electric (PG&E): Investor-owned utility that provides natural gas and electric service to Central and Northern California. PG&E is also responsible for maintaining the electrical grid infrastructure.

Reach code: A local building energy code that sets targets beyond the state requirements for energy use or energy efficiency.

Rideshare: Multiple passengers travelling in a private vehicle. Includes carpooling and vanpooling, as well as apps that match travelers for individual trips.

Shared parking: A type of parking management where parking spaces or facilities are shared by more than one user. Parking can be shared by adjacent property owners (on-site) or a district (off-site).

Sonoma Clean Power (SCP): Community Choice Aggregator that provides electric generation service to cities and unincorporated areas in Mendocino and Sonoma County. SCP electricity is from cleaner sources with lower greenhouse gas emissions than PG&E.

Transportation Demand Management (TDM): Strategies to change travel behavior in order to reduce traffic congestion, increase safety and mobility and conserve energy and reduce greenhouse gas emissions. Strategies may include ridesharing, telecommuting, park-and-ride programs and alternative work schedules.

Transit-oriented communities (TOC): Communities that enable people to access and use transit more often for more types of trips by centering housing, jobs, services and shopping around public transit.

Vehicle miles traveled (VMT): A measurement of miles traveled by vehicles within a specified area for a specified time period.

Unbundled parking: The practice of selling or leasing parking spaces separately from the purchase or lease of the commercial or residential use.

Zero-emission vehicle (ZEV): Vehicles that produce no tailpipe emissions. Generally, ZEVs feature electric powertrains either from a battery or a hydrogen fuel cell. ZEVs may still be responsible for some greenhouse gas emissions, if the GHG content from the electricity generation comes from fossil fuel sources.

Appendix B

Equitable Implementation Tool

It is a City priority to implement climate-related actions and policies that promote racial and social justice in communities disparately impacted by climate change. Equity Priority Areas (see Figure 7) are expected to receive a disproportionately higher impact from climate change and have fewer resources available with which to address those impacted. Integration of these communities' feedback and participation in the City's climate action programs is crucial.

When should you use the Equitable Implementation Tool?

As early in the planning or program development process as possible. When racial and social equity is not addressed until the last minute, the use of the Equity Assessment Tool is less likely to be effective. In contrast, if this tool is used early on, then individual decisions can be aligned with organizational equity goals and desired outcomes. Moreover, by using the tool more than once government staff can ensure equity is incorporated through all phases of the planning process.

What is Equity?

Equity is both the process and the outcome Petaluma seeks to achieve. It is an inclusive approach to transform structures towards access, justice, self-determination, redistribution, and sharing of power and resources. Equitable implementation can take place in various ways:

Procedural Equity:

- Transparent, fair and inclusive process
- Ensure all are treated openly and fairly
- Increase civic engagement opportunities

Distributional Equity:

- Fairly distribute resources, benefits, and burdens
- Prioritize resources for communities that experience greatest inequities and unmet needs

Structural Equity:

- Make a commitment to correct past harms and prevent future unintended consequences
- Address underlying structural and institutional systems that are the root causes of social and racial inequities

The different dimensions of equity should be considered throughout every phase of decision-making (policy, plan, practice) using the checklists in the following sections.

Initiation

Defining Outcomes

The overarching question to consider in this phase is: **What are the desired outcomes for the program under consideration?**

Sub-questions to consider in this first phase include:

- What are the desired outcomes for community members? What are the desired outcomes (re: quantity, quality, or effectiveness) for the City, department, or program?
- What populations or types of people will be affected if your program is approved? Are there different populations or types of people who will be affected if your program is not approved?
- If your program is explicitly intended to promote equity (or reduce an existing inequity), what are the intended changes to how government systems function?
- How will your program change internal organizational norms around racial equity? What actions will your program take to normalize and operationalize racial equity?
- How will your program involve other government departments and agencies in development, implementation, and evaluation?

Community Engagement

The overarching questions to consider in this phase are: **How have Equity Priority Areas been engaged? Are there opportunities to expand engagement?**

Sub-questions to consider in this phase include:

- Who are the most affected community members who are concerned with or have experience related to your program? How have you involved these community members in the development of this program, in a meaningful and culturally appropriate manner?
- Which best practices for meaningful engagement will your program incorporate? (see the Spectrum of Public Participation or The Spectrum of Community Engagement to Ownership)
- How will your program clearly define the role of public input in the process? Will your program share any decision-making power, as feasible, with historically disenfranchised communities?
- What does data and your conversations with stakeholders tell you about existing racial inequities that influence people's lives and should be taken into consideration?

Program Development

Data Analysis

The overarching questions to consider in this phase are: **What's the data? What does the data tell us?**

Sub-questions to consider in this phase include:

- What does population level data tell you about existing racial and social inequities? What does it tell you about root causes or factors influencing inequities?
- Will your program have impacts in specific geographic areas (neighborhoods, areas, or regions)? What are the racial demographics of those living in the area? Equity Priority Areas?
- What performance level data do you have available for your program?
- Are there data gaps? What additional data would be helpful in analyzing your program? If so, how can you obtain better data?

Action Development

The overarching questions to consider in this phase are: **Who will benefit from or be burdened by your program? What strategies for advancing racial equity or mitigating unintended consequences will be incorporated into your program?**

Sub-questions to consider in this phase include:

- Given what you have learned from the data and stakeholder involvement, how will your program increase or decrease racial equity? Who would benefit from or be burdened by your program?
- What has the engagement process told you about the benefits or burdens for different groups?
- What has the engagement process told you about the factors that produce or perpetuate racial inequity related to this program?
- How will your program ensure that historically disenfranchised communities receive a fair share of resources and benefits? Will your program have dedicated set-asides for historically disenfranchised communities?
- Are the benefits of your program broadly accessible to households, especially communities of color, low-income populations, tribal and indigenous communities, and immigrant communities?
- What are some potential unintended consequences? What are the ways in which your program could be modified to enhance positive impacts or mitigate negative impacts, especially for historically disenfranchised communities?
- What mechanisms will you use to assure your program provides historically disenfranchised communities with local capacity building and economic opportunity (e.g., local hire, youth job training, local vendor contracting)?
- What are ways in which existing partnerships could be strengthened to maximize impact in the community?
- How will your program help build trust and long-term relationships between government and historically disenfranchised communities? How will you partner with stakeholders for long-term positive change?
- Are the impacts aligned with the outcomes defined in Phase 1?

Implementation

Capacity

The overarching question to consider in this phase is: **What is your plan for implementation?**

Sub-questions to consider in this phase are:

- Is your program adequately resourced with personnel?
- Is your program adequately resourced with mechanisms to ensure successful implementation and enforcement? What trainings or additional systems need to be developed?
- Is your program adequately resourced to ensure on-going data collection, public reporting, and community engagement?
- How will your program continue to engage with historically disenfranchised communities during the implementation phase?

Funding

The overarching questions to consider in this phase are: **How is the program funded? How will you ensure the program distributes benefits/funding in a way that advances equity?**

Sub-questions to consider in this phase are:

- Is the program adequately resourced with funding?
- Are greater amounts of program funding being allocated to groups of people who are most impacted by climate change and/or face barriers to implementing new practices, including in Equity Priority Areas?

Accessibility

The overarching question to consider in this phase are: **Are all barriers to accessing the program removed?**

Sub-questions to consider in this phase are:

- Are program materials accessible to residents with lower literacy levels?
- Are program materials accessible to residents who speak Spanish and other languages?
- Are program materials accessible to residents without Internet access?
- Are undue barriers (i.e. required document submittals) removed to accommodate residents of all immigration statuses?

Refer to the Petaluma General Plan Health and Environmental Justice Element for more details on accessible City services, resources, and processes.

Learning and Evaluation

The overarching question to consider in this final phase is: **How will you ensure accountability, communicate, and evaluate results?**

Sub-questions to consider in this final phase include:

- How will your program measure, evaluate, and report on the distribution of resources, benefits, and burdens to historically disenfranchised communities?
- How will your program measure, evaluate, and report on the impacts to racial inequities?
- Is your program achieving the anticipated outcomes? Is your program having impact in the community?
- What are your messages and communication strategies that will help advance racial equity?
- How will you continue to partner and deepen relationships with communities to make sure your work to advance racial equity is working and sustainable for the long haul?
- What measures are in place to assure accountability and transparency, especially in communicating results to historically disenfranchised communities?

2018 Community Greenhouse Gas Inventory

Petaluma Blueprint for Climate Action

October 2021

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Greenhouse Gas Emissions Inventory

Petaluma's Climate Emergency Framework articulates a vision to make Petaluma a leader in climate mitigation and sequestration to ensure a stable climate for current and future generations. The City endeavors to reach carbon neutrality no later than 2030. These commitments demonstrate local, regional, and national leadership to creating innovative and strategic pathways to carbon neutrality, a resilient community, and a just transition.

This Community-Wide Greenhouse Gas (GHG) Inventory provides an update on emissions occurring in Petaluma in 2018.[1] It includes emissions by sector (energy, on-road and off-road transportation, solid waste, and water and wastewater) that were emitted in 2010 and 2018. This report presents a summary of the 2010 GHG emissions and details the 2018 data year community GHG inventory completed in 2020 by the Sonoma County Regional Climate Protection Authority (RCPA). It also provides an emissions forecast to 2050.

Key Findings

- **Overall greenhouse gas emissions are rising but emissions per service population are declining.** Community-wide, Petaluma emitted 472,422 metric tons of carbon dioxide equivalent (MTCO$_2$e) in 2018, up 3% from the 2010 greenhouse gas emissions estimate of 460,355 MTCO$_2$e. Despite a 3% increase in overall emissions, annual per service population emissions decreased from 2010 to 2018 by 3% from 5.3 MTCO$_2$e in 2010 to 5.2 MTCO$_2$e in 2018.
- **Transportation continues to be the largest sector of emissions**. Greenhouse gas emissions from on-road transportation were the largest sector, accounting for 67% of all community emissions in 2018. Emissions grew by over 52,000 MTCO$_2$e between 2010-2018, however the increase was largely caused by the change in employment-related land use data from the 2010 transportation model.
- **Emissions from energy use in buildings declined**. Nonresidential and residential energy use made up the second largest sector, accounting for 24% of all community emissions in 2018. Between 2010 and 2018, emissions fell by almost 51,000 MTCO$_2$e, largely due to establishment of Sonoma Clean Power.
- **Solid waste emissions increased**. Landfill emissions increased between 2010 and 2018 by almost 11,000 MTCO$_2$e accounting for 7% of all community emissions in 2018. Landfill waste emissions increased significantly due in part to the Redwood Landfill processing methane less efficiently.

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[1] Emissions from the City of Petaluma's municipal operations are included in the community-wide inventory. A separate Municipal Operations Inventory will be prepared for 2019 emissions by sector, including building energy use, employee commute, and fleet vehicles.

- **Projected emissions are expected to fall but not enough to meet local targets without additional measures**. Total GHG emissions, adjusted for State policy, are projected to decrease 8% from 2018 to 2050 and per service population emissions are projected to decrease 28%.
- **Consumption-based emissions totaled approximately 1.2 million MTCO₂e in 2015, about 146%** higher emissions than the traditional activity-based approach for Petaluma in the same year. This is largely due to higher emissions from air travel and the inclusion of emissions from food, goods, and services.

Petaluma's Greenhouse Gas Emissions Target

Petaluma calculates its greenhouse gas emissions because addressing the impacts of climate change is a core value of the City and community. This emissions inventory provides an overview of Petaluma's current emissions and helps guide greenhouse gas reduction and carbon sequestration policy. Using a coordinated approach, Petaluma and the community can help make residents, businesses, and properties more resilient to the impacts of climate change.

In January 2021, the Petaluma City Council adopted the Climate Emergency Framework. Using a science-based approach, this Framework recommended achieving a target of **carbon neutrality by 2030**. To meet the greenhouse gas emission target, the Framework laid out the following actions:

- Substantially reduce direct emissions from all sectors of the economy;
- Reduce emissions resulting from the purchase of goods and services; and
- Sequester, or draw down, emissions through land and vegetation management practices.

Community-Wide Greenhouse Gas Inventory

This community-wide GHG emissions inventory for Petaluma captures the primary sources of emissions that can be reduced through local and regional government actions. This includes energy use in homes, businesses, vehicles, off-road equipment; emissions from treating and delivering water; and emissions from materials that are thrown away. The activity data is collected from service providers, local utilities, and regional and state agencies.[2] Petaluma uses the inventory to better understand emission sources and trends and track progress towards meeting the carbon neutrality target. Reporting this progress is an important action for Petaluma to ensure accountability.

2010 Community GHG Inventory

The City of Petaluma total 2010 GHG emissions were estimated to be 460,355 $MTCO_2e$. The inventory included building energy use, transportation (on-road and off-road[3]), solid waste, and water. Of the five sectors, on-road transportation accounted for the largest amount of GHG emissions with an estimated emissions of 261,790 $MTCO_2e$, or 57% of total emissions. The second largest was energy with estimated emissions of 165,349 $MTCO_2e$, or 36% of total emissions. The remaining 7% of emissions were made up by solid waste, off-road transportation, and water and wastewater.

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[2] For information on the specific data sources used for each sector, see Appendix A: Detailed 2018 Community-Wide Sector Inventory.

[3] The off-road transportation sector includes lawn and garden, recreational, construction, and industrial equipment.

Table 1: Total Annual Community GHG Emissions (2010)

Community Sector	Subsector	Subsector MTCO$_2$e	Sector MTCO$_2$e	Percent of Total
Transportation	On-Road Transportation	261,790	261,790	57%
Energy	N/A	165,349	165,349	36%
Solid Waste	Residential	9,430	22,262	5%
	Commercial	12,832		
Transportation	Off-Road Transportation	9,960	9,960	2%
Water and Wastewater	Water Use	471	994	0.2%
	Wastewater Treatment	523		
Total		**460,355**		**100%**

Source: RCPA 2018 Sonoma County Greenhouse Gas Inventory and Raimi + Associates 2021.[4]

2018 Community GHG Inventory

The City of Petaluma total 2018 GHG emissions were estimated to be 472,422 MTCO$_2$e, an increase of 12,067 MTCO$_2$e from the 2010 inventory as shown in Table 2. Of the five sectors, on-road transportation accounted for the largest amount of GHG emissions with estimated emissions of 314,493 MTCO$_2$e, or 67% of total emissions. The second largest sector was residential energy use with estimated emissions of 60,409 MTCO$_2$e, or 13% of total emissions. The remaining 20% of emissions were made up by nonresidential energy, solid waste, off-road transportation, and water and wastewater.

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[4] The 2010 emissions presented in Table 1 differ from those presented by the County in the 2015 and 2018 Sonoma County Greenhouse Gas Inventory reports. This is the result of new data and updated accounting best practices for solid waste and off-road transportation emissions. First, solid waste emissions were attributed to the City of Petaluma and the data was updated to reflect the 100-year global warming potential (GWP) value for methane. Second, based on newly obtained data for off-road transportation, emissions from this sector also increased because it includes emissions from additional subsectors consistent with the most recent 2018 Petaluma inventory. As a result of these adjustments, the 2010 community base year GHG inventory increased by 6%.

Table 2: Total Annual Community GHG Emissions (2018)

Community Sector	Subsector	Subsector MTCO$_2$e	Sector MTCO$_2$e	Percent of Total
Transportation	On-Road Transportation	314,493	314,493	67%
Energy	Residential	60,409	114,475	24%
	Nonresidential	54,065		
Solid Waste	Residential	12,669	33,137	7%
	Commercial	20,468		
Transportation	Off-Road Transportation	9,727	9,727	2%
Water and Wastewater	Water Use	73	590	0.1%
	Wastewater Treatment	517		
Total		**472,422**		**100%**

Source: RCPA 2018 Sonoma County Greenhouse Gas Inventory and Raimi + Associates.

Emissions Trends 2010 to 2018

Between 2010 to 2018, Petaluma's emissions increased by 3%, but emissions per service population decreased during the same period. Overall emissions grew by over 12,000 MTCO$_2$e. The service population, which is the sum of population and jobs in the City, also grew from 86,184 in 2010 to 91,577 in 2018. With this, the emissions per service population saw a decrease of 3% from 5.3 MTCO$_2$e to 5.2 MTCO$_2$e per service population.

Table 3: Petaluma Total Annual Community GHG Emissions in 2010 and 2018 (in MTCO$_2$e)

Community Sector	2010	2018	2010 Per Service Population	2018 Per Service Population	Service Population Percent Change
On-Road Transportation	261,790	314,493	3.0	3.4	13%
Energy	165,349	114,475	1.9	1.6	-35%
Solid Waste	22,262	33,137	0.3	0.4	40%
Off-Road Transportation	9,960	9,727	0.1	0.1	-8%
Water and Wastewater	994	590	0.01	0.01	-44%
Total	**460,355**	**472,422**	**5.3**	**5.2**	**-3%**

Source: RCPA 2018 Sonoma County Greenhouse Gas Inventory and Raimi + Associates 2021.

Emissions growth was largely propelled by on-road transportation (+13%) and solid waste (+40%).

- **On-road transportation**: The large increase in vehicle miles traveled (VMT) can be attributed to a recalibration of employment-related land use data used to model transportation. This illustrates how impactful land use is on VMT and greenhouse gas emissions.
- **Solid waste**: The City experienced an increase in waste being sent to the landfill. Landfill waste emissions increased significantly due in part to the Redwood Landfill processing methane less efficiently.[5]

Emissions reductions were largely in the energy (-35%) and water (-44%) sectors.

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[5] Regional Climate Protection Authority. 2018. Greenhouse Gas Inventory Report: Sonoma County Update 2015. Retrieved from https://rcpa.ca.gov/wp-content/uploads/2018/08/Sonoma-County-GHG-Inventory-Update-2015-070618.pdf

- **Energy**: While population and jobs grew, building emissions decreased significantly through establishment of Sonoma Clean Power and increased renewable energy for electricity generation. As a member agency of Sonoma Clean Power, Petaluma has helped to provide residential and commercial customers options for clean power through Clean Start and Evergreen programs.
- **Water and wastewater**: Between 2010 and 2018, water sector emissions declined by 44%, reflecting cleaner energy used to convey water. [6]

These drivers of change are reflected in Figures 1 and 2, the proportion of emissions by sector. Between 2010 and 2018, the proportion of the City's community-wide emissions for on-road transportation grew from 57% to 67% and for solid waste grew from 5% to 7%. Whereas, the proportion of emissions from building energy declined from 36% to 24%.

Figure 1: Petaluma Total Annual Community GHG Emissions in 2010

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[6] City of Petaluma. 2021. 2020 Urban Water Management Plan. Retrieved from: https://docs.google.com/viewerng/viewer?url=https://storage.googleapis.com/proudcity/petalumaca/uploads/2021/06/R-702-City-of-Petaluma-Final-2020-UWMP-2.pdf
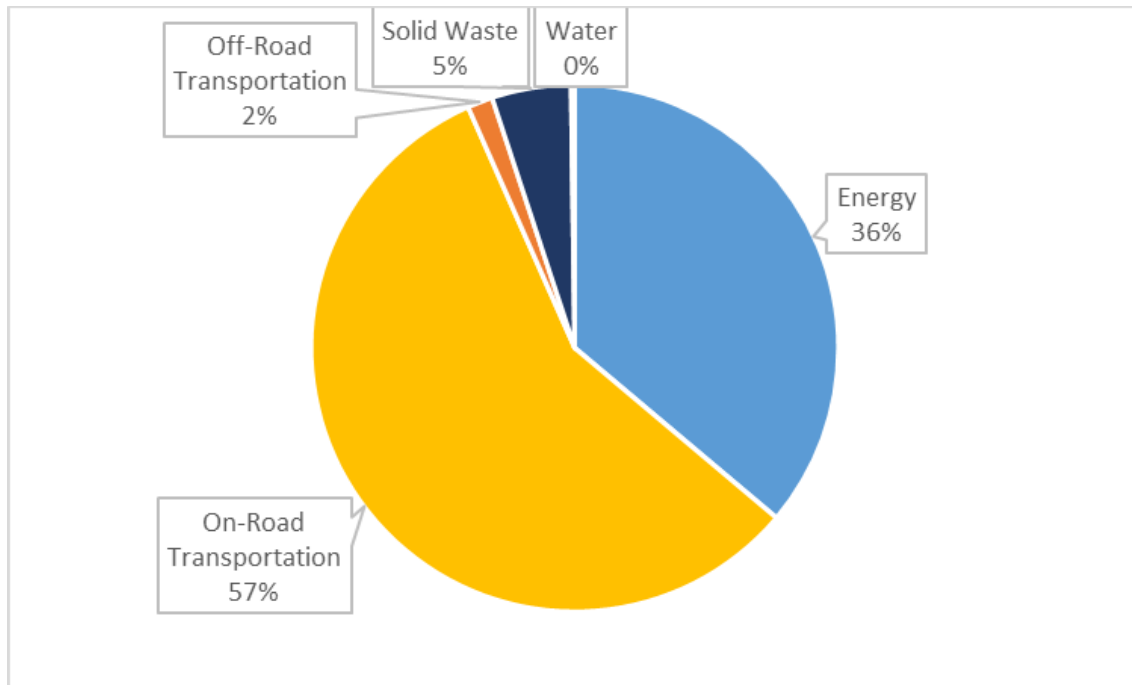
Figure 2: Petaluma Total Annual Community GHG Emissions in 2018
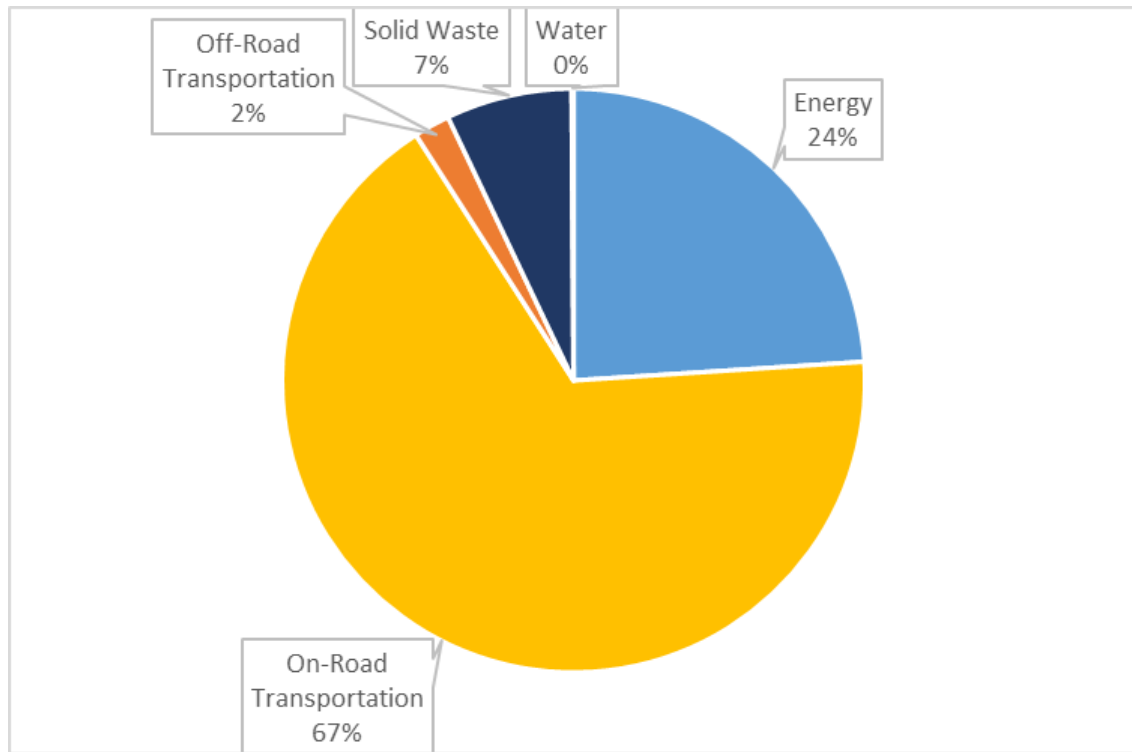
Community GHG Forecast

A forecast of the City's emissions was developed using demographic and socio-economic forecasts to understand how emissions would change over time. This includes two forecasts:

- A **"Business as Usual" (BAU)** GHG emissions forecast considers how Petaluma's emissions would change over time if <u>no action</u> were taken to reduce emissions by the State or at the local level.
- An **Adjusted Business as Usual (ABAU)** forecast shows how Petaluma's emissions are anticipated to change accounting for the impacts of <u>adopted State policies</u> without local action.

Both forecasts use a consistent set of demographic and economic projections derived from the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC).[7] These projections assume that population, housing, employment, and transportation activity will continue to grow through 2040. ABAG/MTC projections have been extrapolated to 2050 to align with the State's GHG reduction targets. Table 4 shows the assumed demographic changes.[8]

Table 4: Petaluma Demographic Projections (2010-2050)

	2010	2018	2020	2025	2030	2040	2045	2050
Population	56,689	60,635	60,830	63,455	64,795	65,970	67,390	68,810
Jobs	29,495	30,942	33,440	34,330	35,460	36,795	39,840	42,885
Housing Units	22,382	23,172	23,745	24,315	24,385	24,760	25,110	25,460
Service Population	86,184	91,577	94,270	97,785	100,255	102,765	107,230	111,695

Source: ABAG/MTC Projections 2040; extrapolated to 2050 by Raimi + Associates.

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[7] Association of Bay Area Governments and the Metropolitan Transportation Commission. Plan Bay Area 2040 Growth Projections. Retrieved from: http://projections.planbayarea.org/

[8] The ABAG/MTC projections are used for the purposes of preparing the BAU and ABAU forecasts. The General Plan Update process may refine these growth projections for Petaluma based on the Alternatives and Plan Development phases of work. If so, these demographic and socio-economic projections will be updated for consistency later in the process, along with the BAU and ABAU GHG forecasts.

Business as Usual GHG Forecast

BAU forecast emissions are expected to rise from 472,442 MTCO$_2$e in 2018 to 613,288 MTCO$_2$e in 2050, a 30% increase. Table 5 shows the forecasted BAU emission levels for each sector in future years and the forecasted annual emissions per capita and per service population.

Table 5: Forecasted Business as Usual Total Annual Community GHG Emissions in 2020-2050 (in MTCO$_2$e)

Sector	2010	2018	2020	2025	2030	2035	2040	2045	2050
On-Road Transportation	261,790	314,493	323,742	335,813	344,295	352,915	368,249	383,582	398,916
Energy	165,349	114,475	126,980	130,189	132,469	135,965	142,552	149,139	155,726
Solid Waste	22,262	33,137	34,112	35,383	36,277	37,185	38,801	40,417	42,032
Off-Road Transportation	7,112	9,727	10,370	10,756	11,028	11,304	11,795	12,286	12,778
Water	994	590	588	608	622	636	661	687	712
Total	**457,507**	**472,422**	**496,533**	**513,353**	**525,433**	**538,975**	**563,746**	**588,517**	**613,288**
Per capita	*8.1*	*7.8*	*8.2*	*8.1*	*8.1*	*8.2*	*8.4*	*8.6*	*8.7*
Per Service Population	*5.3*	*5.2*	*5.3*	*5.2*	*5.2*	*5.2*	*5.3*	*5.3*	*5.3*

Source: RCPA 2018 Sonoma County Greenhouse Gas Inventory and Raimi + Associates 2021.

Adjusted Business as Usual GHG Forecast

The Adjusted Business as Usual (ABAU) forecast shows how Petaluma's emissions are anticipated to change accounting for the impacts of adopted State policies if no action is taken at the local level. There are four major policies that the State has adopted to reduce GHG emissions at the local level:

1. **Renewables Portfolio Standard (RPS):** This law requires that electrical utilities provide an increased amount of electricity from eligible renewable sources. SB 100 requires that 33% of electricity sold by utilities in 2020 be renewable, 60% be renewable in 2030, and 100% be carbon-free in 2045. While Sonoma Clean Power provides a significant amount of the community's electricity, the forecast assumes the same portion of electricity will provided by PG&E as in 2018 (12.5% for residential, 7.1% for nonresidential).
2. **Title 24:** Title 24 is the set of regulations that specifies how new buildings must be constructed, including specifying minimum energy efficiency standards. These standards are updated triennially to be more stringent. California has set a goal for zero-net energy for new construction by 2030.
3. **Pavley Clean Car Standards:** These standards require that vehicles sold in California meet minimum fuel efficiency requirements, and that fuel sold in the state emits less GHGs during production and use.
4. **SB 1383 Regulations:** This law requires organic waste disposal to be reduced by 50% by 2020 and 75% by 2025 in California. To achieve these targets, starting in 2022 jurisdictions must

provide organic waste collection services to all residents and businesses and recycle the materials.[9]

Under the ABAU forecast, emissions are expected to fall from 472,422 MTCO$_2$e in 2018 to 432,379 MTCO$_2$e in 2050, a decrease of 8%. Table 6 shows the forecasted ABAU emission levels for each sector in future years and the forecasted annual emissions per capita and per service population. The ABAU forecast illustrates the importance of supporting the State's climate targets to reduce emissions statewide and the need to kickstart local actions.

Table 6: Forecasted Adjusted Business as Usual Total Annual Community GHG Emissions in 2020-2050 (in MTCO$_2$e)

Sector	2010	2018	2020	2025	2030	2035	2040	2045	2050
On-Road Transportation	261,790	314,493	330,638	292,040	264,133	252,916	256,843	265,534	255,454
Energy	165,349	114,475	125,855	127,866	126,709	124,811	124,977	108,824	113,197
Solid Waste	22,262	33,137	34,112	24,154	24,846	25,607	27,170	28,732	30,294
Off-Road Transportation [10]	7,112	9,727	10,370	10,756	11,028	11,304	11,795	12,286	12,778
Water	994	590	588	608	622	636	661	631	656
Total	**457,507**	**472,422**	**501,563**	**455,425**	**427,339**	**415,275**	**421,446**	**416,007**	**432,379**
Per capita	*8.1*	*7.8*	*8.2*	*7.2*	*6.6*	*6.3*	*6.3*	*6.0*	*6.2*
Per Service Population	*5.3*	*5.2*	*5.3*	*4.7*	*4.3*	*4.0*	*3.9*	*3.7*	*3.7*

Source: RCPA 2018 Sonoma County Greenhouse Gas Inventory and Raimi + Associates 2021.

Local GHG Reduction Measures

Though local measures are not included in the BAU and ABAU forecasts, the City of Petaluma has goals and programs in some of the sectors that go beyond the State's. The impact of these local measures will be further analyzed in the Climate Action and Adaptation Plan.

1. Carbon Neutral by 2030 Target: A target adopting 2030 as the City's target date for carbon neutrality was adopted by the City Council as an action of the Climate Emergency Framework.
2. All-Electric Construction Code: In May 2021 City Council adopted an "All-Electric Construction in New Constructed Buildings" ordinance. The ordinance requires all new residential and commercial buildings use electricity-based systems rather than natural gas.
3. Zero Waste Resolution: In July 2019, the City passed a Zero Waste Resolution that set the goal to reduce waste generation per person by 90% compared to 2003 levels by 2030.

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[9] CalRecycle. California's Short-Lived Climate Pollutant Reduction Strategy. Retrieved from: https://www.calrecycle.ca.gov/organics/slcp
[10] This forecast applies the 2018 Off-Road Transportation MTCO$_2$e per service population as a constant multiplied by the service population estimates for 2020-2050.

2015 Consumption-Based Greenhouse Emissions

Petaluma's Climate Emergency Framework calls for the reduction of indirect emissions in addition to elimination of direct emissions to meet State, County, and City climate goals. A consumption-based GHG inventory captures the community's indirect emissions in addition to the direct emissions discussed in the previous sections of this report. This method of GHG accounting measures the consumption of goods and services by city residents instead of the activities that create emissions within the city. Emissions are reported by consumption category rather than emission source category.

Measuring consumption captures both the direct and lifestyle emissions of the goods and services Petaluma residents use (transportation, housing, food, goods, services, and composting). Emissions are created at all lifecycle stages of those categories: from their raw materials, manufacturing, distribution, retail, and disposal. The consumption-based GHG inventory allocates those emissions to the final consumers instead of the sources that produced them. It excludes emissions from visitor activities and the goods and services produced in Petaluma but exported for consumption outside the city.

The methodology incorporates local consumption and emissions data wherever possible. In other cases, consumption is approximated using econometric analysis of national and statewide transportation and household consumption survey from a study conducted by UC Berkeley and the Bay Area Air Quality Management District in 2015. Due to the many assumptions made in the methodology, the results are only able to provide an indicative approximation of the emissions associated with Petaluma's consumption activities.

This method results in a total of 1.2 million $MTCO_2e$, about 146% higher emissions than the traditional activity-based approach for Petaluma in 2015 and 150% higher than the activity-based emissions in 2018. This is largely due to higher emissions from transportation and the inclusion of emissions from food, goods, and services. Transportation remains the largest source of emissions (35%), followed by food (19%), services (17%), goods (17%), and housing (which includes electricity consumption) (14%). Composting reduces 1% of total GHG emissions. Figure 3 illustrates the average amount of consumption-based, or indirect, emissions by sector for an average Petaluma household in 2015. In total, the average Petaluma household's consumption-based emissions were 44.1 $MTCO_2e$ in 2015.[11]

Petaluma's average household consumption-based emissions were higher than Sonoma County's but consistent with the San Francisco Bay Area as a whole. Sonoma County's average household emissions were 40.4 $MTCO_2e$, 8% less than Petaluma's. The San Francisco Bay Area's emissions were an average of 44.3 $MTCO_2e$ per household, only 0.4% greater than Petaluma's. Despite the differences in GHG emissions per household, the composition of Petaluma, Sonoma County, and the San Francisco Bay Area's consumption-based emissions by sector are nearly identical.[12]

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[11] UC Berkeley and the Bay Area Air Quality Management District. Consumption-Based Greenhouse Gas Inventories. Retrieved from: https://coolclimate.org/inventory
[12] UC Berkeley and the Bay Area Air Quality Management District. Consumption-Based Greenhouse Gas Inventories. Retrieved from: https://coolclimate.org/inventory

Figure 3: 2015 Consumption Based GHG Emissions per Petaluma Household
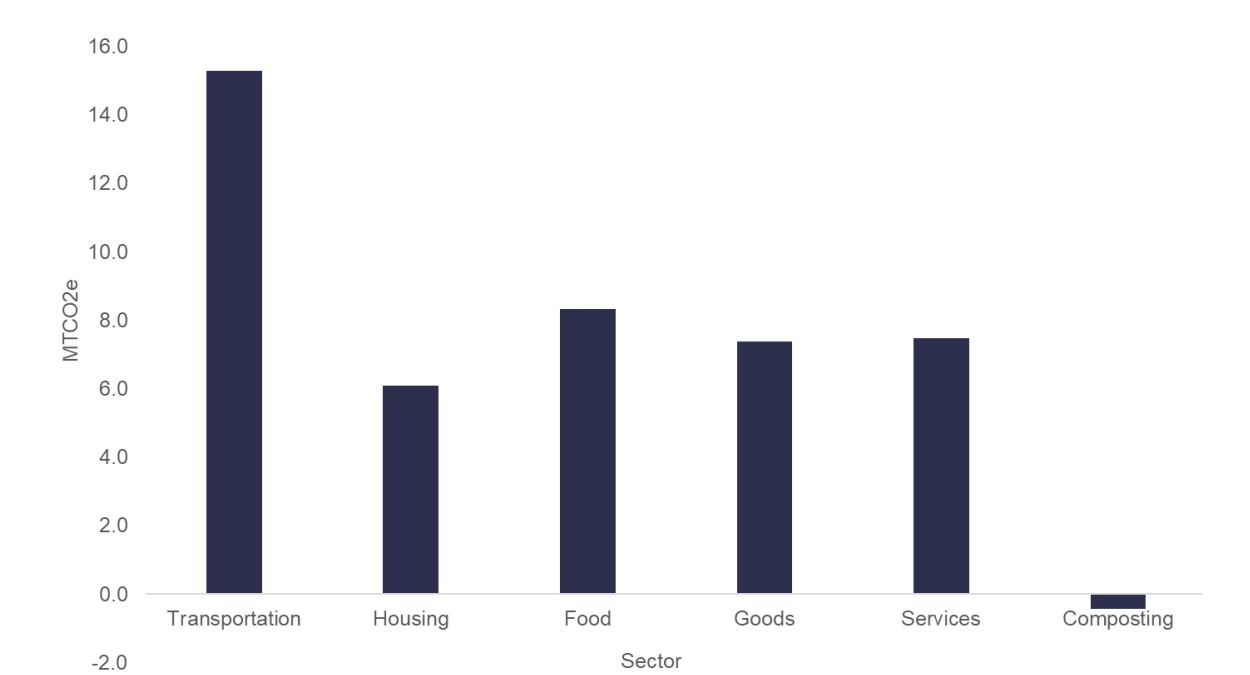
Source: 2015. UC Berkeley and the Bay Area Air Quality Management District. Consumption-Based Greenhouse Gas Inventories.[13]

This graphic shows that while reduction of direct emissions on a jurisdiction level is important, personal choices at a household level are also a key component in achieving carbon neutrality. There are emissions embedded into the services and products received. The path to carbon neutrality must travel through the impacts of business decisions and household choices, and consumers must become educated on those impacts.

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[13] UC Berkeley and the Bay Area Air Quality Management District. Consumption-Based Greenhouse Gas Inventories. Retrieved from: https://coolclimate.org/inventory

Appendix A: Detailed 2018 Community-Wide Sector Inventory

Appendix A provides a detailed inventory of emissions and activity data by sector.

Community Energy

This section presents GHG emissions for the energy sector, specifically emissions generated from residential and nonresidential energy use that occurred within City limits. This section provides electricity and natural gas activity data and emissions estimates in both residential and nonresidential settings for the year 2018.

Electricity

Pacific Gas and Electric (PG&E) and Sonoma Clean Power (SCP) provide electric service to the community and offer community electricity data to local agencies. SCP is a community choice energy provider that offers 93% carbon-free electricity (CleanStart) and 100% renewably-sourced electricity (EverGreen). There are also some Petaluma residents with direct access accounts, meaning they buy power directly from suppliers.

To calculate GHG emissions, an emissions factor is applied to the activity data. Electricity suppliers provided carbon dioxide (CO_2) emissions factors. The electricity generation process also releases small amounts of methane (CH_4) and nitrous oxide (N_2O). Their emissions factors are provided by the EPA's Emissions & Generation Resource Integrated Database (eGRID) and Comprehensive Air Quality Model CAMX. CO_2 is the most commonly referenced GHG, however, numerous gasses have greenhouse characteristics. CH_4 and N_2O are commonly accounted for in GHG inventories. These gasses have a greater global warming potential; CH_4 traps approximately 28 times as much heat as CO_2 over a 100-year period and N_2O traps approximately 265 times as much heat. To account for these differences, a factor is applied to the gasses emissions to calculate a CO_2 equivalence (CO_2e). The emissions factors differ by electricity provider due to their energy portfolio. Table A-1 provides the GHG emissions from electricity use in the city by residential and nonresidential subsectors in 2018. Table A-2 provides the electricity emissions factors from the suppliers that serve Petaluma.

Table A-1: Total Annual Community Electricity Usage and GHG Emissions (2018)

Subsector	Usage (kWh)	Emissions (MTCO$_2$e)
Residential	115,635,936	6,232
Nonresidential	225,115,544	17,945
Total	**340,751,480**	**24,177**

Source: Usage data from PG&E and SCP. Emissions from RCPA 2018 Sonoma County Greenhouse Gas Inventory.

Table A-2. Electricity Emissions Factor by Supplier (2018)

Electricity Supplier	Emissions Factor (MTCO$_2$e/kWh)
PG&E	0.00033348
Direct Access	0.0002404
Sonoma Clean Power Clean Start	0.00004573
Sonoma Clean Power Ever Green	0.00002178

Source: PG&E and SCP

Natural Gas

PG&E provides natural gas utility services to Petaluma. Table A-3 provides the natural gas activity data in therms and the emissions estimates for 2018 separated by residential and nonresidential uses. Nonresidential use combines commercial and industrial use. As with electricity, GHG emissions are estimated from activity data by applying an emission factor. However, unlike electricity, the carbon intensity of the combustion of natural gas does not vary annually and it does not vary between residential and nonresidential. These estimates are using the most current emissions coefficient for natural gas from the provider.

Table A-3: Total Annual Community Natural Gas Usage and GHG Emissions (2018)

Subsector	Usage (therms)	Emissions (MTCO$_2$e)
Residential	10,074,751	54,177
Nonresidential	6,716,871	36,120
Total	**16,791,622**	**90,297**

Source: Usage data from PG&E. Emissions from RCPA 2018 Sonoma County Greenhouse Gas Inventory.

Total Energy GHG Emissions

Table A-4 shows the total energy related GHG emissions decreased by 31% from 2010 to 2018. In particular, this overall reduction in energy GHG emissions reflects the transition to the SCP.

Table A-4: Total Annual Community GHG Emissions from Energy Use in 2010 and 2018

	2010	2018	% Change
GHG Emissions (MTCO$_2$e)	165,259	114,475	-31%

On-Road Transportation

This section presents the GHG emissions for the transportation sector, specifically from all on-road trips (including cars, trucks, buses, etc.) that have occurred within City limits. This section provides activity data and emissions estimates for baseline year 2010 and 2018. Transportation emissions were calculated using the origin-destination methodology and the data sources were the 2010 and 2015 Sonoma County Transportation Authority Travel Models and EMFAC 2017. Vehicle miles traveled estimates for both years were converted to GHG emissions using the 2017 Emissions Factor (EMFAC) model. EMFAC represents the state's current understanding of motor vehicle travel activities and associated emission levels from on-road vehicles including cars, trucks, and buses in California. Though the Sonoma-Marin Area Rail Transit (SMART) began service in August 2017, its emissions are not captured in the city's inventory due to the use of the SCTA's 2015 model.

Table A-5 shows that VMT has increased in Petaluma by 42% from 2010 to 2018 and associated GHG emissions increased by only 20%. The large jump in VMT is due to the recalibration of employment-related land use data over time used in the transportation models.

Though the VMT increase can be attributed to the modelling, the trend of smaller gains in emissions compared to VMT is a factor of State and Federal regulations including improved fuel efficiency standards and low carbon fuel standards. Emissions have also increased slower than VMT due to an increasingly efficient overall fleet of vehicles within the city (including an increased uptake of electric, hybrid, and high efficiency vehicles). In 2018, there were more electric vehicle sales in Sonoma County than any previous year.

Table A-5: Total Annual Community GHG Emissions from On-Road Transportation (2018)

Transit Type	2010			2018		
	Total VMT	$MTCO_2e$/VMT	Total Emissions	Total VMT	$MTCO_2e$/VMT	Total Emissions
Vehicles	513,485,773	0.000692	261,790	729,365,214	0.000431	314,439

Off-Road Transportation

This section presents the GHG emissions for off-road transportation activity, specifically emissions from construction, lawn and garden, recreational, and industrial equipment use within the city.

Off-road emissions data for Sonoma County was gathered from the CARB OFFROAD2007, OFFROAD2017, RV2018, and PC2014 modelling tools. Since the CARB tool models emissions for the entire county, city specific emissions data was proportioned using demographic and housing data. Data from the tool was compiled and summed according to emissions type. Emissions were then converted into carbon dioxide equivalents. From 2010 to 2018, the city experienced the largest increases in emissions from the Airport Ground Support Equipment and Construction and Mining Equipment subsectors. The largest decreases were from the Recreational Equipment and Oil Drilling subsectors.

Table A-6: Total Annual Off-Road GHG Emissions by Subsector for 2010 and 2018

Subsector	GHG Emissions (MTCO$_2$e)		
	2010	2018	% Change
Recreational Equipment	1,036.65	766.93	-26%
Construction and Mining Equipment	2,920.63	3,517.75	20%
Industrial Equipment	2,307.39	2,157.34	-7%
Lawn and Garden Equipment	271.20	297.32	10%
Light Commercial Equipment	1,637.86	1,393.30	-15%
Agricultural Equipment	337.76	292.31	-13%
Airport Ground Support Equipment	13.44	17.10	27%
Transport Refrigeration Units	5.29	4.26	-19%
Oil Drilling	4.98	3.94	-21%
Entertainment Equipment	5.50	5.41	-2%
Pleasure Craft	1,419.74	1,271.45	-10%
Total	**9,960.43**	**9,727.10**	**-2%**

Source: CARB EMFAC Off-Road model

Solid Waste

Solid waste emissions include emissions associated with the decomposition of waste in landfills and compost facilities. The 2018 data for residential and commercial waste in landfills was provided by Zero Waste Sonoma (formerly Sonoma County Waste Management Agency).

Solid waste emissions are mostly methane (CH_4) from the decomposition of the materials in the landfill. Emissions are estimated from activity data (tons of waste sent to landfill) by applying an emissions factor, which is different for residential and commercial waste because their composition varies. The waste composition comes from the CalRecycle 2015 Waste Characterization Study and the emissions factors are from the WARM model.

Table A-7 indicates that total solid waste emissions increased by 49% from 2010 to 2018. Landfill waste emissions increased significantly due in part to the Redwood Landfill processing methane less efficiently.[14]

Table A-7: Total Annual Community Solid Waste Tons and GHG Emissions (2010 and 2018)

Solid Waste	2010		2018			% Change
	Tons	Emissions (MTCO$_2$e)	Tons	Emissions Factor	Emissions (MTCO$_2$e)	
Residential	-	9,430	21,485	0.5896548	12,669	34%
Commercial	-	12,832	36,105	0.5669055	20,468	60%
Total Sector	**22,262**		**57,590**	**-**	**33,137**	**49%**

Water Use and Wastewater

The water sector uses energy to collect, convey, treat, and deliver water to users, and then it uses additional energy to collect, treat, and dispose of the resulting wastewater. This energy use yields both direct and indirect greenhouse gas emissions. The City of Petaluma uses municipal water sources from Sonoma Water and recycled water from the Petaluma Wastewater Treatment Plant, which serves the City of Petaluma as well as a small portion of Unincorporated Sonoma County.

For water use, the city witnessed a significant reduction in GHG emissions from potable water use between 2010 and 2018. While the City's gross water use declined (5-year average 10,289 acre feet

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[14] Regional Climate Protection Authority. 2018. Greenhouse Gas Inventory Report: Sonoma County Update 2015. Retrieved from https://rcpa.ca.gov/wp-content/uploads/2018/08/Sonoma-County-GHG-Inventory-Update-2015-070618.pdf

[2003-2007][15] to 9,816 acre feet in 2018), the GHG intensity of the energy used to convey water declined significantly with the use of renewable energy by the Sonoma County Water Agency. As a result, emissions from water use declined by 85%.

Table A-8: Total Annual Community Water Usage and Wastewater GHG Emissions

Water	2010		2018		% Change
	Gallons (mil)	Emissions (MTCO$_2$e)	Gallons (mil)	Emissions (MTCO$_2$e)	
Water Use	Not available	471	30,124	73	- 85%
Wastewater	1,852	523	1,708	517	-1%
Total Sector		**994**	**31,832**	**590**	**-41%**

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[15] City of Petaluma. 2021. 2020 Urban Water Management Plan. Retrieved from: https://docs.google.com/viewerng/viewer?url=https://storage.googleapis.com/proudcity/petalumaca/uploads/2021/06/R-702-City-of-Petaluma-Final-2020-UWMP-2.pdf.

2019 Municipal Greenhouse Gas Inventory

Petaluma Climate Action and Adaptation Plan

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Municipal Greenhouse Gas Emissions Inventory

Petaluma's Climate Emergency Framework articulates a vision to make Petaluma a leader in climate mitigation and sequestration to ensure a stable climate for current and future generations. The City endeavors to reach carbon neutrality no later than 2030. These commitments demonstrate local, regional, and national leadership to creating innovative and strategic pathways to carbon neutrality, a resilient community, and a just transition.

Emissions inventories help government leaders understand the sources and magnitude of greenhouse gas (GHG) emissions that are generated from various activities associated with City operations. Emissions accounting standards and protocols are used to compile, synthesize, analyze, and report emissions data at the City operations scale.

This Municipal Greenhouse Gas Inventory provides a summary of emissions produced by City of Petaluma operations in 2019. As the first municipal GHG inventory conducted for the City operations, this document provides a baseline of emissions that the City can use to track progress towards its climate commitments. The preparation of this inventory also helped identify where the City can improve its data collection to more accurately estimate municipal GHG emissions in the future.

The 2019 inventory primarily follows the Local Government Operations Protocol (LGOP) developed by the California Air Resources Board, California Climate Action Registry, ICLEI, and the Climate Registry. Calendar year 2019 was chosen as it was the most recent calendar year with complete data available.

Key Findings

- **Total estimated greenhouse gas emissions from City operations were 3,653 MTCO$_2$e in 2019**.
- **Fleet vehicles were the City's largest source of emissions**. Greenhouse gas emissions from fleet vehicles were the largest sector, accounting for 31% of the emissions from City operations in 2019.
- **Employee travel was the City's second largest source of emissions**. Employee travel accounted for 27% of the emissions from City operations in 2019.
- **Electricity emissions from Buildings and Facilities, Streetlights and Traffic Signals, and Airport Facilities are zero because the City's provider is Sonoma Clean Power EverGreen**.
- **Improving City data collection procedures will result in more accurate inventorying of greenhouse gas emissions in the future.** The City should establish new data tracking protocols to more accurately inventory emissions from fleet vehicles, solid waste, water, and wastewater sectors, as well as fugitive emissions.

Sources of Municipal GHG Emissions

This municipal inventory uses the ICLEI Local Government Operations Protocol (LGOP) to estimate the emissions produced by operations the City owns or controls. Using the City's operational control boundaries for the inventory represents the emission sources for which Petaluma has direct control over. This means that Petaluma can exert influence over operations to achieve further reductions in emissions. Emissions sources includes direct emissions from the combustion of fuels and indirect emissions from the purchase of electricity as described in Table 1. Table 1 also lists sources of emissions for which data is currently unavailable.

Table 1: Sources of Emissions

Sector	Description	Inclusion in Inventory
Buildings and Other Facilities	City buildings and facilities use electricity and natural gas.	Included
Streetlights and Traffic Signals	The City maintains over 5,100 streetlights, each using electricity.	Included
Wastewater Facilities	The City owns and operates the Ellis Creek Water Recycling Facility.	Included
Airport Facilities	The City owns and operates the Petaluma Municipal Airport.	Included
Vehicle Fleet	Petaluma owns vehicles for water maintenance, firefighting, and other services.	Included
Transit Fleet	The City operates Petaluma Transit.	Included
Employee Travel	The City had 319 employees in 2019, and this accounts for emissions from the fuel employees consumed travelling to and from work.	Included
Water Delivery Facilities	City facilities use potable water which is conveyed using electricity.	Not included. Water use data not available
Solid Waste	The City does not have its own landfill, but City facilities and operations generate waste that is hauled by Recology.	Not included. Solid waste generation data not available
Other Process and Fugitive Emissions	Fugitive emissions are generated from the use of refrigerants in building HVAC equipment and refrigeration in the fleet air conditioning.	Not included. Refrigerant data not available
Port Facilities	No sources	Not included
Power Generation Facilities	No sources	Not included

2019 Emissions Inventory Results Summary

The City emitted an estimated 3,653 MTCO$_2$e from its operations in 2019, representing less than 1% of communitywide emissions.[1] These emissions were produced by buildings and facilities, employee commute, fleet vehicles, transit fleet vehicles, and wastewater sectors. This inventory also includes the streetlights / traffic signals and airport facilities, but those sectors did not have any recorded emissions. These facilities and infrastructure use carbon-free electricity and did not report any natural gas consumption.

Of the sectors inventoried, the vehicle fleet comprised the largest portion (31%) of the total municipal operations emissions in 2019. Employee travel was the second largest source, accounting for 27% of emissions.

Table 2: Emissions by Sector

Sector	Emissions (MTCO$_2$e)	Percent of Total
Buildings and Facilities	701	19%
Streetlights and Traffic Signals	0	0%
Airport Facilities	0	0%
Employee Travel	982	27%
Vehicle Fleet	1,143	31%
Transit Fleet	662	18%
Wastewater	165	5%
Total	**3,653**	**100%**
Sources: City of Petaluma, 2021; Raimi + Associates, 2021.		

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[1] The Petaluma Community GHG Inventory estimated 2018 emissions.

Figure 1: 2019 Emissions by Sector
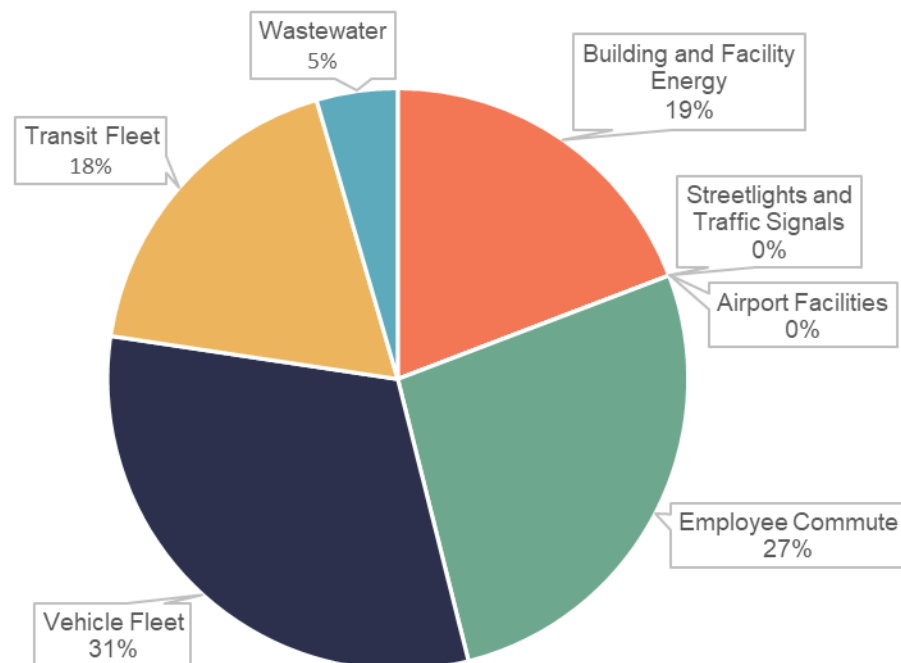
2019 Emissions Inventory by Sector

Buildings and Facilities

The buildings and facilities sector accounts for the emissions from energy consumption. Total 2019 emissions from buildings and facilities were estimated at 701 MTCO$_2$e, or 19% of the City's operations emissions in 2019. Since Petaluma purchases carbon-free electricity from Sonoma Clean Power, all emissions are from the use of natural gas. Table 3 shows the total annual buildings and facilities sector emissions broken down by subsector.

Table 3: Buildings and Facilities Energy Emissions by Sector

Sector	Electricity Consumption (in kWh)	Natural Gas Consumption (in Therms)	Emissions Factor	Emissions (MTCO$_2$e)
Electricity	12,970,814	N/A	0	0
Natural Gas	N/A	132,182	0.005307026	701
Total	**12,970,814**	**132,182**	**N/A**	**701**

Note: Electricity consumed by airport facilities and streetlights and signals are reported as their own sectors.
Sources: Sonoma Clean Power, 2019; Pacific Gas & Electric, 2019

Electricity

Municipal electricity consumption data was obtained from Sonoma Clean Power (SCP) in the form of total kilowatt hours (kWh) consumed by service account in 2019. The City's electricity is provided by SCP's 100% renewably sourced EverGreen program, is assumed to be carbon free.[2] Therefore, the emissions of the nearly 13 million kWh of electricity used by City operations in 2019 zero out. Table 4 indicates emissions by subsector, which are estimates based on the City's customer service classifications.

Table 4: Building and Facility Electricity Consumption by Subsector

Subsector	Electricity Consumption (in kWh)	Percent of Total
Municipal Buildings and Facilities	9,793,947	76%
Sewer, Water, and Wastewater Pumps	1,411,894	11%
Other Electrical Service*	1,207,887	9%
Parks	348,530	3%
Marina	143,544	1%
Irrigation	65,013	1%
Total	**12,970,814**	**100%**

*Other Electrical Service entries have address data but do not have a facility type associated.
Sources: Sonoma Clean Power, 2019; City of Petaluma, 2021

When broken down by facility type, Municipal Buildings and Facilities account for over two thirds of consumption (see Figure 2). These include specific buildings and facilities, including the Ellis Creek Water

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[2] The emissions factor associated with SCP EverGreen is 0.00000045 MTCO2e/kWh. Since it is from 100% renewable sources and carbon free, it is modeled as zero emission.

Recycling Facility, City Hall, the Police Station, and the Fleet Yard (see Table 5 for more details). The other sectors were small in comparison. Sewer, water, and wastewater pumps and other electrical services accounted for 11% and 9% of the consumption, respectively.

Figure 2: Buildings and Facilities Energy Use by Subsector
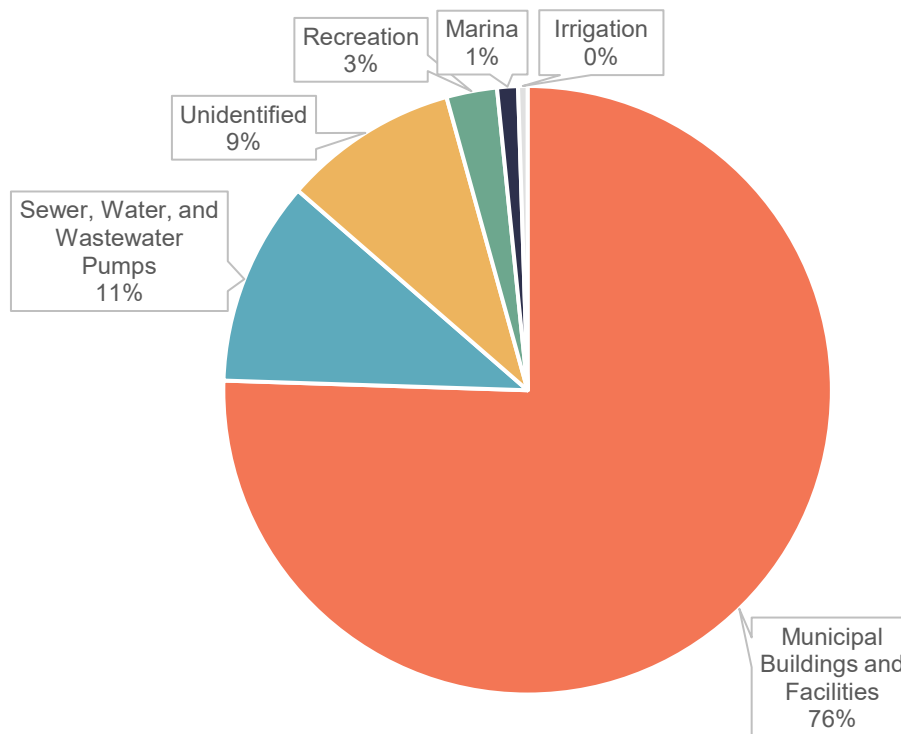
The buildings and facilities that used the most electricity are listed in Table 5. Even though the use of SCP EverGreen meant this electricity did not produce any GHG emissions, these high-using facilities are an opportunity to reduce electricity consumption and energy costs. Ellis Creek Water Recycling Facility accounts for 68% of the electricity consumed by all City buildings and facilities.

Table 5: Top 5 Consumers of Electricity in Buildings and Facilities Sector

Facility	Electricity Consumption (kWh)
Ellis Creek Water Recycling Facility	8,853,620
Sewer Pump Station – 950 Hopper St	787,237
City Hall	297,590
Police Station	236,748
Browns Ln End Electrical Service	208,602
Sources: Sonoma Clean Power, 2019.	

Natural Gas

The City's total natural gas emissions from municipal operations were 701 MTCO$_2$e in 2019, approximately 19% of total municipal emissions. The top consumer of natural gas in City operations was the Swim Center, which accounted for over half of the City's natural gas usage. Other top consumers of natural gas are listed in Table 6.

Table 6: Top 5 Consumers of Natural Gas in Buildings and Facilities Sector

Facility	Natural Gas Consumption (kWh)	Emissions (MTCO$_2$e)
Swim Center	74,467	395
Ellis Creek Water Recycling Facility	19,567	104
City Hall	12,759	68
Community Center	4,851	26
Corporation Yard	4,540	24
Sources: PG&E, 2019		

Natural gas data was obtained from Pacific Gas & Electric (PG&E) in the form of therms consumed by street address annually. The City identified the natural gas usage of municipal facilities by matching up the facility name and its address. Natural gas emissions are calculated by applying an emissions factor to the therms of natural gas used.

Streetlights and Traffic Signals

Streetlights and traffic signals consumed 1,122,596 kWh of electricity in 2019. However, they did not produce any GHG emissions because the City's electricity is supplied by SCP EverGreen. There was no natural gas usage reported for the sector. Table 7 shows energy consumption by subsector.

Table 7: Streetlight and Traffic Signal Energy Consumption

Subsector	Electricity Consumption (kWh)
Streetlights	951,358
Traffic Control and Signals	161,238
Total	**1,112,596**

Sources: Sonoma Clean Power, 2019.

Airport Facilities

Though the City used 195,484 kWh of electricity at airport facilities in 2019, they did not produce any GHG emissions because the City's electricity is supplied by SCP EverGreen. Vehicles that operate at the airport are counted in the Fleet Vehicle sector. There was no natural gas usage reported for airport facilities. Table 8 shows the electricity consumption by facility.

Table 8: Airport Facilities Electricity Consumption

Facility	Electricity Consumption (kWh)
Airport – 2200 E Wash	76,638
Hangar #2 Airport	36,185
Airport – 2200 E Wash	23,758
Pilot Building/HQ – 2210 E Washington	17,673
Hangars 9-12	19,108
Hangar 18A	11,845
Hangar 18B	4,130
Hangar B	4,120
Hangar 18C	846
Total	**195,484**

Sources: Sonoma Clean Power, 2019; City of Petaluma, 2021.

Employee Travel

Employee travel accounts for emissions from the fuel City employees consumed travelling to and from work. The amount of annual vehicle miles traveled (VMT) for all employees was extrapolated from responses to the 2019 Petaluma Employee Commute Survey, which was conducted August 2021.

Table 9 below shows the proportion of 2019 employee commute VMT by fuel type. A vast majority of employee VMT is from gasoline-powered vehicles, and a small number of employees reported using electric or hybrid vehicles. Even fewer reported using transit, walking, and/or biking. No employees reported commuting in vehicles that use biodiesel, compressed natural gas, or hydrogen fuel cell.

Table 9: 2019 Annual Employee Commute VMT by Fuel Type

Fuel Type	Annual VMT	% VMT by Fuel Type	Average Fuel Efficiency (mpg)	Emissions (MTCO$_2$e)
Diesel Light Duty Truck	63,247	2.8%	16.2	40
Electric	65,515	2.9%	N/A	0
Gasoline Passenger Vehicle	997,090	44.6%	22.5	391
Gasoline Light Duty Truck	910,559	40.7%	16.2	496
Hybrid (gasoline/electric)	54,680	2.4%	31.2	15
Hybrid Electric (plug-in)	141,110	6.31%	31.2	40
Transit + Bike/Walk	2,772	0.1%	N/A	
Total	2,234,973	100%		982

Sources: Raimi + Associates, 2021; Greenhouse Gas Protocol and World Resources Institute, n.d.

The estimated total emissions from the commutes of the City's 319 employees were estimated at 982 MTCO$_2$e, or 27% of the City's operations emissions in 2019. This analysis estimated the gallons of fuel used by each vehicle type and multiplied that by the emissions factors supplied by the 2018 EPA "Emissions Factors for Greenhouse Gas Inventories"[3] and converted by the GHG Protocol Corporate Standards.[4] This analysis assumed 219.2 commute days annually, which is an estimate that removes weekends, holidays, vacation days and other factors from the total year.

[3] US EPA. "Emission Factors for Greenhouse Gas Inventories." 9 March 2018. https://www.epa.gov/sites/default/files/2018-03/documents/emission-factors_mar_2018_0.pdf
[4] Greenhouse Gas Protocol & World Resources Institute. "GHG Emissions Calculation Tool." Table S1 – Mobile Combustion. March 2021. https://ghgprotocol.org/calculation-tools

Fleet Vehicles

The City's fleet vehicles account for 1,143 MTCO₂e, or 31% of the City's operations emissions in 2019. As a full-service city, Petaluma owns a wide variety of vehicle types used for street maintenance, fire protection, and other functions. Vehicles that are part of the City's transit agency are accounted for in the next section. Table 10 indicates the emissions from the subsectors of fuel and vehicle types. The fleet contains four electric passenger vehicles; however, they do not consume fuel so their emissions are zero in this sector.[5]

Table 10: Fleet Emissions by Subsector

Fuel and Vehicle Type	Fuel Consumption (gal)	Emissions Factor (MTCO₂e/gal)	Emissions (MTCO₂e)
Electric Vehicle*	NA	NA	NA
Motor Gasoline - Gasoline Passenger Cars	12,052	0.008812	106
Motor Gasoline - Gasoline Light-duty Trucks (Vans, Pickup Trucks, SUVs)	64,702	0.008816	570
Motor Gasoline - Gasoline Heavy-duty Vehicles	6,343	0.008819	56
Motor Gasoline - Hybrid (Gasoline) Passenger Cars	5,709	0.008825	50
Motor Gasoline - Gasoline Motorcycles	7,612	0.00897	68
Diesel Fuel - Diesel Light-duty Trucks	6,343	0.01022	65
Diesel Fuel - Diesel Medium- and Heavy-duty Vehicles	22,202	0.01022	227
Total	**124,964**	**N/A**	**1,143**

*Electricity usage for electric vehicles is included in the building and facilities sector.
Note: Fuel consumption (gal) for each fuel type was estimated by multiplying the percentage that fuel type comprises in the fleet by the total fleet fuel use.
Note: Petaluma Transit vehicles (buses and pool vehicles) were not included in this analysis
Sources: City of Petaluma, 2021; EPA, 2018; Greenhouse Gas Protocol and World Resources Institute, n.d.

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[5] Per the LGOP, emissions from the electricity used to charge fleet EVs should be reported in the Vehicle Fleet sector. However, due to lack of data, the energy is aggregated with Building and Facility energy use.

This analysis estimated the gallons of fuel used by each vehicle type and multiplied that by the emissions factors supplied by the 2018 EPA "Emissions Factors for Greenhouse Gas Inventories"[6] and converted by the GHG Protocol Corporate Standards.[7] This estimate indicates that Gasoline Light-Duty Trucks are the largest source of emissions in the fleet, followed by Diesel Medium- and Heavy-Duty Vehicles and Gasoline Passenger Cars.

Transit Vehicles

Petaluma Transit emitted an estimated 662 MTCO$_2$e, or 18% of the City's operations emissions. Petaluma Transit runs six fixed bus routes in addition to providing paratransit service and pool vehicles. The fleet consists of eleven diesel buses, three diesel-electric hybrid buses, eleven gasoline cutaway buses, and three gasoline vehicles.[8] Emissions from transit vehicles were calculated following the LGOP protocol in which the known fuel use is multiplied by the emissions factor of the respective fuel type. Table 11 shows the Petaluma Transit fleet emissions by fuel type.

Table 11: Transit Fleet Emissions by Fuel Type

Fuel Type	Fuel Consumption (gal)	Emissions Factor (MTCO$_2$e/gal)	Emissions (MTCO$_2$e)
Gasoline	12,414	0.0089	110
Diesel	54,315	0.0102	551
Total	**66,729**	**N/A**	**662**
Sources: Federal Transit Administration, 2019; US Energy Information Administration, n.d.; Greenhouse Gas Protocol and World Resources Institute, n.d.			

Wastewater

The City owns and operates the Ellis Creek Water Recycling Facility (ECWRF) that collects, treats, and then re-uses both the waste and the water that goes into the city sewer. Total estimated emissions[9] from wastewater treatment were 165 MTCO$_2$e, or 5% of the City's operations emissions.

Wastewater treatment processes create fugitive GHGs, mainly methane (CH_4) and nitrous oxide (N_2O). Though 90% of ECWRF's operations serve Petaluma and 10% serves Unincorporated Sonoma County, all of the emissions from the plant are counted as part of the City's emissions because it is under its

[6] US EPA. "Emission Factors for Greenhouse Gas Inventories." 9 March 2018. https://www.epa.gov/sites/default/files/2018-03/documents/emission-factors_mar_2018_0.pdf
[7] Greenhouse Gas Protocol & World Resources Institute. "GHG Emissions Calculation Tool." Table S1 – Mobile Combustion. March 2021. https://ghgprotocol.org/calculation-tools
[8] Hall, Jared. Personal communication. 21 September 2021.
[9] 2018 data was used to approximate ECWRF's 2019 emissions.

operational control. Table 12 indicates the emissions produced by various processes associated with wastewater recycling.

Table 12: Ellis Creek Water Recycling Facility Emissions by Type

Emission Type	Emissions (MTCO$_2$e)
Stationary Emissions from Combustion of Digester Gas	2.3
Process Methane Emissions from Wastewater Treatment Lagoons	4.7
Process Nitrous Oxide Emissions from Wastewater Treatment Plants with Nitrification or Denitrification	112.5
Fugitive Nitrous Oxide Emissions from Effluent Discharge	45.6
Total	**165**

Note: This analysis uses 2018 data due to unavailability of 2019 data. The facility's emissions should be relatively consistent from one year to the next.
Sources: City of Petaluma, 2021

Data Collection Recommendations

This municipal inventory is an important first step for the City to understand where its emissions come from and track the effectiveness of reduction measures in the future. The City collects and maintains many of the necessary data sources to calculate greenhouse gas emissions from municipal operations, Incomplete or lack of data for several sectors, however, means that the City does not have a complete picture of municipal emissions in 2019. Table 13 shows additional data sets and departmental responsibilities organized by sector.

Table 13: Future Data Collection Recommendations

Sector	Description	Department
Wastewater Facilities	Renewable natural gas from the anaerobic digestion system	Environmental Services Division
Vehicle Fleet	Fuel consumption by type, including: • Direct measurements of fuel use from vehicle fuel gauges or storage tanks • Fuel receipts • Purchase records for bulk storage fuel purchases • kWh or electricity used to charge electric vehicles Keep non-transit and transit fleet data separate	Finance or Public Works and Utilities

Reimbursed Employee Miles	Vehicle miles traveled and/or total of annual reimbursements	Finance
Water Delivery Facilities	Water use	Parks and Facilities Maintenance Division or the Finance Department
Solid Waste	Tons of waste produced by City operations	Public Works and Utilities
Other Process and Fugitive Emissions	To accurately track emissions from refrigerants: • The difference in quantity of the HFC in storage at the beginning of the year versus the end of the year at each City facility • The purchases and sales/disbursements of HFCs during the year • Type of HFC or refrigerant blend • Net increase in full charge/nameplate capacity	Parks and Facilities Maintenance Division or the Finance Department

Appendix D1: City Sustainability Plans, Policies, and Programs

This appendix reviews the City of Petaluma's existing sustainability-related plans, policies, and programs as compared to sustainability best practices. This list contains plans, policies, and programs that not only address sources of greenhouse gas (GHG) emissions, but quality of life and equity issues as well. It summarizes documents provided in the initial data transfer and identified in a review of the City's website. The best practices list was developed by reviewing the requirements of sustainability rating systems, such as STAR Communities and LEED for Cities, current trends in municipal sustainability, and the strategies of leading-edge cities.

Petaluma has already developed many of the key planning documents; however, some gaps do exist in the implementation of those programs as shown below. Based on this initial review, Petaluma could focus on enhancing sustainability in the Transportation sector, which can achieve GHG emission reductions especially given the City's participation in Sonoma Clean Power. There is also the opportunity for the City to implement more actions related to municipal operations. These strategies will be explored in the General Plan and associated climate action and adaptation plan, including the quantification of different GHG reduction measures.

Equity and Social Justice

Plan/Policy/Program Best Practices	Petaluma Policy Status
Equity and Social Justice	
Environmental Justice or Social Equity Plan	Climate Emergency Framework (2021)
Aging in Place Plan	No existing plan – Age Friendly Petaluma Initiative; Senior Advisory Committee
Community Study/Needs Assessment	No existing plan
School District wellness policy	Petaluma City Schools Wellness Policy (2006)

Mitigation and Sequestration

Plan/Policy/Program Best Practices	Petaluma Policy Status
Long-Range Planning Documents	
General Plan Circulation Element – promotes compact, mixed-use development Land Use Element – Identifies areas for mixed-use development, density, TOD, infill	General Plan Update (in process)
Sustainability Plan	Sustainability Action Plan (2015)

Climate Action Plan (CAP)	Sonoma County Regional Climate Action Plan (2016)
Greenhouse Gas (GHG) Inventory	City data included in Sonoma County GHG Inventory (2018) with baseline year 2010
Local Hazard Mitigation Plan or Resilience Plan	Local Hazard Mitigation Plan (2020)
Buildings + Energy	
Key Plan: Energy Action Plan (EAP) or CAP	Climate Emergency Framework (2021), Sustainability Plan (2015)
Key Implementation Measure: Community Choice Aggregation (CCA)	Sonoma Clean Power (SCP). EverGreen 100% renewable. CleanStart 50% renewable (93% carbon free)
Solar PV streamlined permitting	Streamlining for roof-mount solar PV ≤10kW (2020)
EV readiness policy and streamlined permitting	CALGreen Tier 1 (Single/2 Family DU - EV ready circuit; New multifamily - 15% EV charging spaces; New hotel/motel – EV charging spaces varies; New nonresidential – EV charging spaces varies) [10]
Green building requirements (beyond CALGreen)	CALGreen Tier 1 required
Energy Efficiency or electrification reach code	All-Electric Construction in Newly Constructed Buildings (Municipal Code Chapter 17.09) and local amendments to CA Building Standards Code (2021)
Energy efficiency retrofit programs	Available through SCP, PG&E
PACE or other financing mechanisms	Available through SCP, Sonoma County Energy Independence Program, and BayRen
Benchmarking ordinance	No existing ordinance – AB 802 compliant
Public benefit agreements that include sustainability measures	No existing policy
Water	
Key Plan: Water conservation ordinance	Water Shortage Contingency Plan
Model Water Efficient Landscape Ordinance (MWELO)	2016
Supply alternative sources of water (i.e. recycled)	Recycled: Ellis Creek Water Recycling Facility (non-potable): 1,756 AF (2020) for on-site uses and irrigation of city parks and agricultural land

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[10] Percentages reflect CALGreen 2019. EV charging spaces refers to spaces that are capable of supporting future EVSE

	Groundwater: <5%, for supplemental or emergency purposes only
Water Quality Reporting	Yes – City of Petaluma Public Works & Utilities
Watershed management plan	2015
Stormwater management plan - NPDES	2003
Urban Water Management Plan	2020
Low Impact Development (LID) standards	No existing policy
Green Infrastructure Plan	No existing plan
Transportation	
Key Plan: Active Transportation Plan	Bicycle and Pedestrian Plan Update (in progress)
Complete streets policy	No existing policy
Transportation Demand Management	No existing policy
SB 743 implementation	VMT Guidelines (2021)
Establish/support bike share program	BikeLink at Petaluma Downtown SMART Station
Public EV chargers	One at City Hall, one at SMART Station, and a dozen scattered at commercial and hotel locations.
Senior mobility services/ free shuttle	No existing policy
Transportation Agency	Yes - Petaluma Transit
ZEV Bus Policy	No existing policy
Waste	
Key Plan: Zero Waste Plan	No existing plan but has a zero-waste goal
C&D waste diversion requirements	Yes – 65% for new buildings, 50% for all other projects must be diverted
Mandatory recycling	Yes – Commercial, MFR, residential
Mandatory composting – including food scraps	No existing policy – AB 1826 compliant
Mandatory school recycling and composting	No existing policy
Plastic bag ban	SB 207 compliant
Polystyrene ban	Disposable Food Service Ware and Polystyrene Foam Product Waste Reduction Ordinance
Plastic straw ban	No existing policy
Open Space	
Key Plan: Urban Forestry Management Plan	No existing plan
Key Plan: Open Space or Parks Management Plan	No existing plans
Park fees (Quimby Act and AB 1600)	Park Land Acquisition Fee (2008)
Tree preservation ordinance	Zoning Code Ch. 17: Tree Preservation Mun. Code Ch. 8.28: Heritage and Landmark Trees (1991)
Privately Owned Public Open Space program	No existing program

Municipal Strategies	
Key Plan: Sustainability Program Manager	No existing position
Facilities Improvement Plan – energy efficiency, decarbonization, LEED, resiliency etc.	No existing policy – goal in 2015 Sustainability Plan
Environmentally preferable purchasing (EPP)	No existing policy
Fleet alternative fuel policy	No existing policy
Healthy food vending policy	No existing policy

Community Engagement

Plan/Policy/Program Best Practices	Petaluma Policy Status
Education + Outreach	
Green business certification program	Sonoma County Green Business Program
Utility energy and water efficiency program outreach	Yes – water savings rebates and programs
Farmers' Market & Market Match program	Yes – East Side Farmers' Market, Walnut Park Farmers' Market, and Evening Market
Local government volunteer program	No

Adaptation and Social Resilience

Plan/Policy/Program Best Practices	Petaluma Policy Status
Adaptation and Social Resilience	
Resilience or Climate Adaptation Plans	Climate Emergency Framework (2021)
CERT Program	No existing program
Resiliency Hub Policy	No existing policy
Cooling Centers Policy	No existing policy – one center in partnership with New Life Church

Other

Plan/Policy/Program Best Practices	Petaluma Policy Status
Other	
Arts strategic plan	Public Art Master Plan (2013)
Historic Preservation Plan/Ordinance	Ch. 15 Zoning Code