SAN LEANDRO 2021 CLIMATE ACTION PLAN

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Prepared by~~for~~:

City of San Leandro
835 East 14th Street
San Leandro, California 94577
www.sanleandro.org

In collaboration with~~Prepared by~~:

PlaceWorks
2040 Bancroft Way, Suite 400
Berkeley, California 94704
www.placeworks.com

ACKNOWLEDGEMENTS

San Leandro Green Team

Anjana Mepani, Senior Planner

Catrina Christian, Emergency Services Specialist

Debbie Pollart, Public Works Director

Ely Hwang, Recreation and Human Services Manager

Hayes Morehouse, Water Pollution Control Plant Administrative Analyst II

Heather Johnson, Senior Library Assistant

Hoi-Fei Mok, PhD, Sustainability Manager

Jeanette Dong, Recreation and Human Services Director

Keith Cooke, Engineering and Transportation Director

Nick Thom, City Engineer

Patricia Mallari, Librarian

Ramya Sankar, Innovation Technology Analyst

Sally Perez, Purchasing Technician

Scott Koll, Financial Services Manager

Tonya Richardson, Recycling Program

Tony Batalla, Information Services Director

Fran Robustelli, City Manager

Council Members

Mayor Pauline Russo Cutter

Councilmember Deborah Cox, District 1

Councilmember Bryan Azevedo, District 2

Vice Mayor Victor Aguilar, Jr., District 3

Councilmember Fred Simon, District 4

Councilmember Corina Lopez, District 5

Councilmember Pete Ballew, District 6

Planning Commission

Kenneth Pon, At Large

Tony Breslin, District 1

Luis Mendoza, District 2

Rick C Solis, District 3

Anthony Tejada, District 4

Michael Santos, District 5

Dylan M Boldt, District 6

~~Kenneth Pon, At Large~~

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Abbreviations and Acronyms

ABAG: Association of Bay Area Governments

BAAQMD: Bay Area Air Quality Management District

BART: Bay Area Rapid Transit

BayCAN: Bay Climate Adaptation Network

BCDC: Bay Conservation and Development Commission

CAP: climate action plan

CARB: California Air Resources Board

CBO: community-based organization

CEC: California Energy Commission

CEQA: California Environmental Quality Act

EBCE: East Bay Community Energy

EBMUD: East Bay Municipal Utility District

EV: Electric vehicle

GHG: greenhouse gas

MTC: Metropolitan Transportation Commission

$MTCO_2e$: metric tons of CO2-equivalent emissions

PSPS: public safety power shutoff

RPS: Renewable Portfolio Standard

SCS: sustainable communities strategy

SLR: sea-level rise

TDM: Transportation demand management

TNC: Transportation Network Companies

TOD: Transit-Oriented Development

USDN: Urban Sustainability Directors Network

WELO: Water-Efficient Landscaping Ordinance

WPCP: Water Pollution Control Plant

Glossary

Adaptation: Making changes in response to current or future conditions (such as the increased frequency and intensity of climate-related hazards), usually to reduce harm and to take advantage of new opportunities.[1, 2]

Adaptive Capacity: The "combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities."[3]

Climate Change: A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer.

Climate Justice: The concept that no group of people should disproportionately bear the burden of climate impacts or the costs of mitigation and adaptation.[4]

Community Asset: A valued feature of a community that may be harmed by climate change. Community assets may include buildings, infrastructure, community services, ecosystems, and economic drivers.

Disadvantaged Communities: Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation, or with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment. Criteria are determined by California legislation.[5,6]

Equality: The state in which each individual or group of people is given the same resources or opportunities.[7]

Equity: The state in which each individual or group is allocated the resources needed to reach an equal outcome.[8]

Exposure: The presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.[9]

Extreme Event: When a weather or climate variable exceeds the upper or lower thresholds of its observed range.[10, 11]

Frontline Communities: Term used by communities to self-identify as places that experience the impacts of issues such as environmental pollution, climate change, and the economic crisis first and most severely. These communities are most often communities of color and low income.[12]

Hazard: An event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural losses, damage to the environment, interruption of business, or other types of harm or loss.[13]

Hazard Mitigation: Sustained action taken to reduce or eliminate the long-term risk to human life and property through actions that reduce hazard, exposure, and vulnerability.[14]

Impact: The effects (especially the negative effects) of a hazard or other conditions associated with climate change.

Just transition: A sustainable and equitable economic transition to carbon neutrality, shifting economic activities to sustainable models in a way that prioritizes job quality, equity, and economic opportunity for affected and disadvantaged communities. [15]

Reach code: A local municipal code that exceeds the state building code. A reach code must be at least as stringent as the statewide code, cost-effective, approved by the California Energy Commission, and updated and re-approved with each state Energy Code update.

Resilience: The capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience. Community resilience is the ability of communities to withstand, recover, and learn from past disasters to strengthen future response and recovery efforts.

Risk: The potential for damage or loss created by the interaction of hazards with assets such as buildings, infrastructure, or natural and cultural resources.

Sensitivity: The level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.[16]

Social Vulnerability: The susceptibility of a given population to harm from exposure to a hazard, directly affecting its ability to prepare for, respond to, and recover.[17, 18]

Susceptibility: A person or population's potential for vulnerability due to demographic, socioeconomic, and geolocation characteristics.

Vulnerability: Climate vulnerability describes the degree to which natural, built, and human systems are susceptible "…to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt."[19]

Vulnerability Assessment: An analysis of how a changing climate may harm a community and which elements—people, buildings and structures, resources, and other assets—are most vulnerable to its effects based on an assessment of exposure, sensitivity, the potential impact(s), and the community's adaptive capacity.

Vulnerable Communities: Vulnerable communities experience heightened risk and increased sensitivity to climate change and have less capacity and fewer resources to

cope with, adapt to, or recover from climate impacts. These disproportionate effects are caused by physical (built and environmental), social, political, and/or economic factor(s), which are exacerbated by climate impacts.[20]

Vulnerable Populations: Vulnerable populations include, but are not limited to, women; racial or ethnic groups; low-income individuals and families; individuals who are incarcerated or have been incarcerated; individuals with disabilities; individuals with mental health conditions; children; youth and young adults; seniors; immigrants and refugees; individuals who are limited English proficient (LEP); and lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQQ) communities, or combinations of these populations.[21, 22]

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Executive Summary

PLAN DEVELOPMENT AND GUIDING PRINCIPLES

The 2021 Climate Action Plan (CAP) is San Leandro's comprehensive strategy to reduce greenhouse gas (GHG) emissions and to adapt to changing climate conditions. The CAP allows City of San Leandro (City) decision-makers, staff, and the community to understand the sources and magnitude of local GHG emissions and the impacts of climate change on the community, reduce GHG emissions, prioritize steps to achieve GHG emission-reduction targets, and increase resilience.

The 2021 CAP is an update to the 2009 CAP, providing updated information, an expanded set of GHG reduction strategies, climate adaptation strategies, and a planning horizon out to 2050. The CAP contains an inventory of the City of San Leandro's GHG emissions from the transportation, energy, off-road equipment, waste, and water and wastewater sectors, as well as from Bay Area Rapid Transit (BART) operations; an assessment of the populations and community assets most vulnerable to climate change; and goals, strategies, and actions to address climate change adaptation and GHG emissions. The 2021 CAP also presents a work plan and monitoring program for the City to track progress over time.

San Leandro community members are committed to principles of justice and equity, and the 2021 CAP must reflect this. To that end, the City prioritized an engagement effort and plan preparation process that was fair, inclusive, community-driven, and cognizant of the structural injustices faced by many members of the San Leandro community over time. Community-driven planning efforts aim to challenge the imbalance of power inherent in traditional planning practices by following the lead of frontline communities, who identify their own desires, needs, and potential policy solutions, as opposed to being told which problems their communities face by City officials or outside policymakers. Under a community-driven planning paradigm, frontline communities work together with government agencies to develop creative solutions that address the issues of greatest concern to frontline communities and reflect community expertise and lived experience.

This CAP acknowledges the need for San Leandro to work toward a just transition and address the root causes of the climate crisis. A just transition refers to the transition away from the extractive profit-driven economy and culture to one that is ecologically sustainable, just, and equitable for all members of society. Central tenants of a just transition include utilization of renewable energy, creation of sustainable green jobs, and distribution of resources and climate action benefits to people based on the greatest unmet need.

The City assessed the strategies proposed in this CAP for their equity impact both in the short-term and long-term, using best practice guidance from leading climate policy

organizations. City staff and community partners working on CAP implementation will use these assessments to determine priority needs and methods for moving forward.

GREENHOUSE GAS INVENTORY AND FORECAST

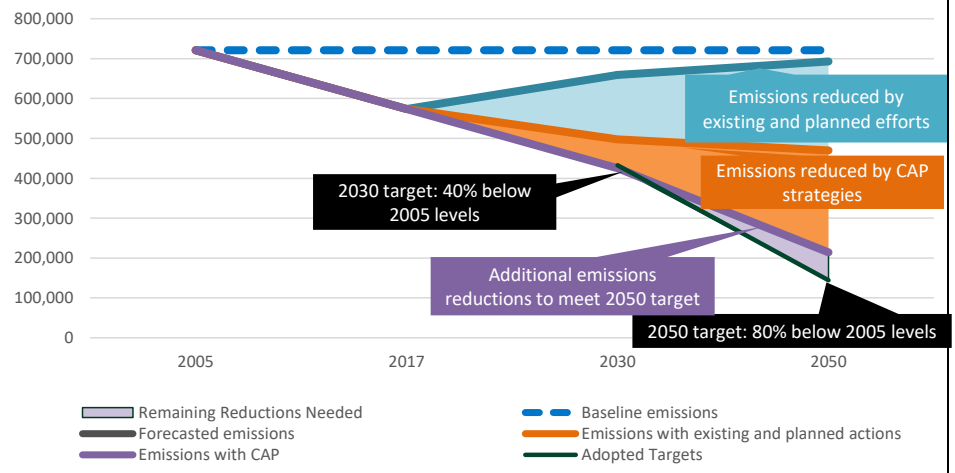
A GHG inventory is a summary of the GHG emissions generated by activities that take place within a community. The GHG emissions inventory and the GHG forecast lay the groundwork for the 2021 CAP, which seeks to align the City's GHG reduction efforts with State-recommended targets. The City is committed to achieving emissions reductions of 40 percent below 2005 levels by 2030 and 80 percent below 2005 levels by 2050.

The 2021 CAP contains GHG inventories for the years 2005 (updated from the inventory included in the 2009 CAP to take into account the latest science in GHG accounting and emissions factors), 2010, 2015, and 2017. These inventories assess emissions produced by the transportation, energy, waste, off-road, and water and wastewater sectors, as well as emissions associated with BART operations and emissions reductions attributable to biomass sequestration.

GHG emissions have declined steadily from 2005 levels. In the base year of 2005, the City of San Leandro emitted approximately 720,990 $MTCO_2e$. Transportation was the largest contributor to community emissions, emitting approximately 50 percent of the city's total. In 2017, GHG emissions totaled 573,580 $MTCO_2e$, a decrease of 20 percent from 2005. Transportation remained the largest source of GHG emissions, accounting for approximately 60 percent of the community's total.

A GHG emissions forecast uses estimates of future community population and job growth to predict how emissions would grow over time if no action is taken at the federal, state, or local or regional level to reduce them. The CAP update includes a GHG forecast for the calendar years 2020, 2030, and 2050, relying on growth assumptions from the California Department of Finance and Association of Bay Area Governments (ABAG). Relative to 2017 emissions, San Leandro's GHG emissions are expected to increase by approximately 21 percent by 2050 if no action is taken to reduce emissions, as shown in **Figure ES-1**.

Figure ES-1 San Leandro GHG Emissions with Reduction Strategies, 2020 to 2050 (Absolute) ($MTCO_2e$)



CLIMATE CHANGE VULNERABILITY ASSESSMENT

A vulnerability assessment is an analysis of how climate change is likely to affect a community. The vulnerability assessment in this CAP looks at the anticipated hazards and other public safety concerns that may be created or exacerbated by climate change and how these conditions have the potential to harm people, buildings and infrastructure, ecosystems, and other assets in San Leandro.

San Leandro, like most communities in California, is expected to experience multiple direct impacts due to climate change, including Bayshore flooding, drought, extreme heat, inland flooding, landslide and debris flow, sea-level rise (SLR), severe storms, and wildfire. These climate change effects are projected to have myriad intersecting and compounding impacts on San Leandro's communities, ecosystems, infrastructures, and services. Potentially vulnerable communities include those with low incomes; those with unstable or deficient housing; those unfamiliar with or unable to access community and government services and resources; those with limited mobility; and those who are physiologically more sensitive to changing climate conditions, such as children, the elderly, and people with certain medical conditions.

Locations within San Leandro that are particularly vulnerable to the effects of climate change include steep slopes and adjacent areas, riparian habitats, and low-lying parts of the city, particularly those located near the water. Steep slopes are susceptible to

landslides, riparian habitats are vulnerable to drought and water quality degradation, and both riparian habitats and low-lying areas are vulnerable to flooding and SLR. Components of the built environment and associated services that are especially susceptible to climate change include electrical infrastructure and services, transportation infrastructure, the San Leandro Water Treatment Plant, and low-lying sewer lift stations and sewer infrastructure.

GREENHOUSE GAS REDUCTION AND CLIMATE ADAPTION STRATEGIES

To evaluate the City's current progress toward meeting its emissions reductions targets, this CAP acknowledges the City's existing climate policies and programs, planned future actions, and actions already and soon-to-be implemented at the state level and estimates GHG emissions reductions associated with the implementation of these actions. With the implementation of existing State and local programs, the City of San Leandro's GHG emissions are projected to fall to 497,750 $MTCO_2e$ by 2030 and 469,790 $MTCO_2e$ by 2050.

While implementation of existing State and local actions will help the City meets its GHG reduction targets, these actions are insufficient on their own. The CAP identifies future strategies that will allow the City to achieve its reduction targets. Each GHG reduction strategy falls into 1 of 12 broad categories addressing building electrification, energy efficiency, renewable energy, transportation, waste reduction and management, water efficiency, and equity and just transition. In conjunction with existing local and state programs, these strategies provide a flexible path to resiliency, sustainability, and justice while reducing the city's GHG emissions to 425,330 $MTCO_2e$ by 2030 (41 percent below 2005 levels) and 214,170 $MTCO_2e$ by 2050 (70 percent below 2005 levels).

This CAP also provides a suite of climate change adaptation strategies. These strategies aspire to foster climate change adaptation by reducing the severity of the climate change impacts on the community and by supporting the community's ability to respond to and recover from climate change–related disruption. Climate change adaptation strategies are organized into six overarching goals that address overall community hazardous conditions preparation and response, public health and safety, resilient development, resilient infrastructure, biological and cultural resources, and future CAP updates.

PLAN IMPLEMENTATION

Implementing the CAP will require City leadership to put the strategies identified in the CAP into effect and report progress. To ensure that the implementation process is efficient and transparent, this CAP includes a work plan that identifies responsible departments, time frames, and relative costs associated with each measure. Implementation strategies include monitoring and reporting progress towards CAP emissions targets, continuing partnerships with relevant agencies and community groups, securing funding to implement the CAP, updating the baseline emissions inventory and CAP every five years, and maintaining and updating the CAP to allow for greater resilience.

1. Introduction

ABOUT THIS PLAN

The 2021 Climate Action Plan (CAP) is San Leandro's comprehensive strategy to reduce greenhouse gas (GHG) emissions and to adapt to changing climate conditions. This CAP demonstrates the leadership of community members and the City on sustainability and climate action. San Leandro's General Plan directs the preparation, ongoing implementation, and update of the CAP, providing the framework for San Leandro to reduce its community-wide GHG emissions in a manner consistent with State reduction targets for 2020 and 2030 and the longer-term goal for 2050. This document outlines both the City's successes to date in promoting environmental responsibility and provides a blueprint for continued sustainability.

The CAP is prepared consistent with the California Environmental Quality Act (CEQA) Guidelines for Plans for the Reduction of Greenhouse Gas Emissions (California Code of Regulations Section 15183.5). This allows the 2021 CAP to support and possibly streamline environmental review of GHG emissions related to future development projects within the city.

The 2021 CAP is a direct update to the 2009 CAP. This chapter includes an updated regulatory framework, community profile, and guiding principles for the City's climate action planning and a summary of this update process. Subsequent chapters ~~The 2021 CAP~~ analyze~~s~~ San Leandro's progress to date in meeting its adopted GHG reduction targets and contains new information to achieve more significant and longer-term GHG reductions. It also presents a work plan and monitoring program for the City to track progress and effectiveness of implementation over time.

The CAP allows City decision-makers and the community to understand the sources and magnitude of local GHG emissions (Chapter 2), the community's vulnerability to changing climate conditions (Chapter 3), establish goals to reduce GHG emissions, and prioritize steps to achieve GHG emission reduction targets and

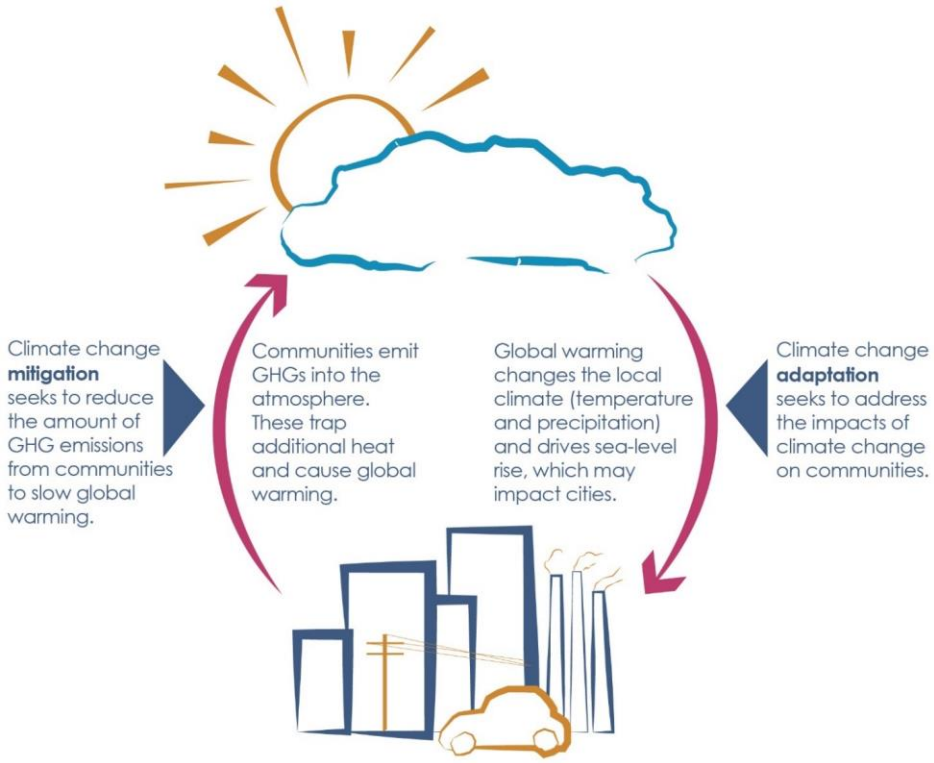
Climate Mitigation and Adaptation

Addressing the challenges posed by climate change requires two separate but related approaches, as illustrated in Figure 1. The first is GHG reduction, also called climate change mitigation or GHG mitigation, which focuses on reducing emissions of GHGs that are responsible for climate change. The second, climate adaptation, recognizes that some degree of climate change is inevitable and focuses on reducing the potential harm caused by these changes.

Some strategies may address only one of these approaches, while others provide both GHG mitigation and climate adaptation benefits. This updated CAP is a holistic plan that will help San Leandro reduce its GHG emissions while simultaneously adapting to changing climate conditions.

increase resilience (Chapters 4 and 5). The CAP updates and expands the City's goals, strategies, and actions to address climate adaptation and GHG emissions from the transportation, energy, off-road equipment, waste, and water and wastewater sectors, as well as BART operations. It also revises San Leandro's implementation program and framework to monitor and report progress (Chapter 6).

Figure 1 Climate Change Mitigation and Adaptation



Climate change mitigation and climate change adaptation are the two separate but related issues of comprehensive climate action planning. Image from the California Adaptation Planning Guide.

HOW TO USE THIS PLAN

The 2021 CAP provides a set of strategies for reducing San Leandro's GHG emissions and improving community resilience to hazardous conditions, along with the technical foundations behind these strategies and recommendations for how to implement them. It lays out an approach for how the City of San Leandro can improve climate adaptation, meet its 2030 GHG reduction target, and set a path for long-term GHG reductions out to 2050.

The 2021 CAP is not a prescriptive plan with a rigid path, but instead is a document that demonstrates a potential path for achieving these goals. As the City and community partners implement this plan, some strategies may turn out to be infeasible or less effective. In other cases, new opportunities may arise that provide additional GHG reduction and climate adaptation benefits that are not currently accounted for in this plan. The 2021 CAP does not limit efforts that go beyond the scope of the strategies it contains and may be thought of as a "floor" for climate action planning in San Leandro rather than a ceiling.

The 2021 CAP is also not meant to be San Leandro's final word on climate action planning. Although this plan discusses GHG emissions out to 2050 and climate adaptation out to 2100, this plan is not meant to remain unchanged until these years. City staff will regularly report on implementation of the 2021 CAP to community members and City officials and will modify CAP implementation based on learned successes and opportunities for improvement, community support, available resources, and other factors. City staff will also update the 2021 CAP and the technical background information included in this plan on a regular basis to ensure it remains up to date and reflects current activities. Chapter 6 contains details on the 2021 CAP implementation approach.

WHAT IS CLIMATE CHANGE?

Making meaningful, impactful decisions about reducing GHG emissions and allowing for climate adaptation requires an understanding of the science of climate change. While there are regularly new discoveries and advances in this field, the basics of climate change are a matter of global scientific consensus.

There are several gases, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), in Earth's atmosphere that allow light to pass through but trap some of the heat radiating off of Earth's surface rather than allowing it to escape into space. The gases function like the panes of glass in a greenhouse, helping to keep the temperature within the greenhouse at comfortable levels. As a result, these gases are called GHGs and this mechanism is called the greenhouse effect. However, for approximately the past 200 years, human activities have been increasing the concentrations of GHGs in the atmosphere, mostly through the burning of fossil fuels such as coal, petroleum, and natural

gas. As the levels of GHGs in the atmosphere increase, more heat is trapped, increasing the temperature of the Earth's surface at an unprecedented rate. Since Earth's climate system is driven by the movement of heat in the atmosphere and in the oceans, more heat creates shifts in the global climate system, which we call climate change. The effects of climate change vary in different geographic locations, but often include significant changes to temperatures, precipitation patterns, and storm activity. Chapter 3 discusses the climate change effects in San Leandro.

CLIMATE ACTION PLANNING IN SAN LEANDRO

The City of San Leandro prepared its first CAP in 2009 following completion of multiple GHG emission inventories. The City completed its first milestone in 2005, an emissions inventory for both community-wide emissions and from municipal operations. In ~~July 2006~~2007, the City adopted its first GHG reduction target to reduce community-wide emissions by 25 percent below 2005 levels by 2020.

In 2007, the City joined 1,000 other U.S. cities in signing the U.S. Mayor's Climate Protection Commitment and joined the Alameda County Climate Protection Project sponsored by StopWaste. This included assembly of a Climate Protection Task Force that brings all City departments together to develop climate solutions. Specific climate actions taken at that time included the nationally recognized smart growth land use plans, such as the Downtown Transit-Oriented Development Strategy, a Green Building Ordinance for municipal buildings, a Construction and Demolition Debris Recycling Ordinance, increased recycling and composting programs for residents, and installation of LED traffic signals.

In 2008, ICLEI USA prepared a second community-wide GHG emissions inventory, providing an opportunity to assess change since the 2005 baseline. The 2008 effort included an inventory and a business-as-usual forecast of GHG emissions for the year 2020, which enabled the City to estimate the amount of emissions reductions needed to meet its goal and to provide a foundation for preparation of the City's first CAP, which the City adopted in 2009.

Since adoption of the 2009 CAP, the City created and has designated the Sustainability Office to oversee implementation of the CAP and coordinate the City's sustainability efforts. In 2017, the City joined the Global Covenant of Mayors, a global coalition of mayors and city officials with a mission to reduce local GHG emissions that involves a written commitment from the mayor or other city official to reduce annual GHG emissions, set a GHG reduction target, and adopt an updated CAP that addresses how the city will meet its GHG reduction targets and sets a framework for climate adaptation.

More recent local efforts include adoption of the 2018 Bay Fair Transit-Oriented Development Strategy, membership in East Bay Community Energy, and energy and water

efficiency retrofits to City facilities. The City also serves as a member of the East Bay Green Corridor.

In 2018, the San Leandro City Council approved an update to the 2009 CAP to align with the State targets and goals. The City Council recognized San Leandro's role as an early adopter of climate action planning but identified a need for the City to conduct a more rigorous analysis of proposed GHG reduction activities and to plan for longer-term climate mitigation. As part of its authorization of the CAP update, the City Council ~~also~~ approved a resolution to adopt GHG emissions reduction goals to reduce emissions to 40 percent below 2005 levels by ~~adopted~~ 2030 and 80 percent below 2005 levels by 2050. ~~GHG reduction targets to direct the update.~~ The City Council also called for combining GHG reduction efforts with climate adaptation planning, helping San Leandro to address the challenges posed by climate change in a more comprehensive manner.

In December 2019, the City Council approved Resolution Number 2019-200, a resolution endorsing the declaration of a climate emergency and requesting regional collaboration on an immediate just transition and emergency mobilization effort to restore a safe climate. Through this resolution, the City Council declared that a climate emergency threatens the city, region, state, nation, and planet and committed to seek a just transition and climate emergency mobilization effort to address climate change with appropriate financial and regulatory assistance from the County of Alameda and state and federal authorities. Through these efforts, the City would reduce community-wide GHG emissions as quickly as feasible towards the aspirational goal of zero net emissions, support safety drawing down carbon from the atmosphere, and accelerating adaptation and resilience strategies in preparation for intensifying climate impacts.

This CAP preserves the structure and format of the 2009 document while providing updated information, an expanded set of GHG reduction strategies, recommended climate adaptation strategies, and a longer-term planning horizon. As a result, the 2021 CAP provides a revised framework for addressing GHG emissions in the community, including an updated consolidated framework for the review and analysis of GHG emissions from new development activities.

Community Profile

Since its incorporation in 1872, San Leandro has experienced several waves of transformative change. In the early 20th century, the community evolved from a small town into a bustling agricultural center. After World War II, the agricultural center was transformed into a booming suburb. With each wave of development and change, the City experienced social, economic, and physical transformation. Its neighborhoods, industrial areas, Downtown, and shopping areas have evolved and adapted as times have changed.

San Leandro is in the heart of the San Francisco Bay Area, the fourth-largest metropolitan area in the country and home to 7.5 million residents. The City is in the "East Bay" subarea, which consists of 33 cities in Alameda and Contra Costa counties. Though the area is sometimes perceived as suburban San Francisco, it is a diverse metropolitan area in its own right. In 2016, the East Bay was home to 1.1 million jobs and 2.7 million residents. San Leandro is the sixth-largest city in Alameda County in population, following Oakland, Fremont, Hayward, Berkeley, and Livermore. It is the ninth largest in terms of population density.

The San Francisco Bay Area sets the pace for technology, research, and innovation on a global scale. San Leandro sits at the heart of this region. It is a city with beautiful scenery and mild weather, diverse housing choices, and an engaged populace that is committed to sustaining an excellent quality of life.

San Leandro's vibrant community.

San Leandro is well connected to the region's transportation system, with three freeways (I-880, I--580, and I-238) passing through the City, and Metropolitan Oakland International Airport just a few miles away. The City is served by two BART stations, two active railroad lines, and an extensive network of bus and shuttle routes. These transportation advantages have helped define San Leandro's economic base and were a key factor in its development during the second half of the 20th century.

Over the past 30 years, San Leandro has developed a reputation as a diverse, innovative, business-friendly city. Much of the City's identity dates from the mid-20th century when the community was at the leading edge of the Bay Area's development. Many of the City's residents arrived during this era. While some of these residents continue to make San Leandro their home today, tens of thousands of new residents have arrived in the last few decades. Much of the City's growth was fueled by an increase in people of color and young families, who transformed many of the City's shopping areas and cultural institutions and increased school enrollment. This influx of new residents has brought new energy to the City and enriched its perspectives on issues such as growth, transportation, and the environment. The City has found strength in its growing diversity and is emerging as a center for creative problem-solving and new ideas.

The City's industrial areas have also evolved. In 2011, San Leandro launched a public-private partnership to develop an 11-mile fiber optics loop (Lit San Leandro). This investment has put the City on the leading edge of the Bay Area economy and has repositioned the City's businesses to be more technology and innovation focused. At the same time, San Leandro has promoted higher-density development around its two BART stations, creating a development pattern that is oriented toward walking, bicycling, and transit use rather than driving.

As of 2019, San Leandro was home to 90,025 people, an increase of 13 percent since 2000 and 6 percent since 2010. This is a slightly slower growth rate than Alameda County as a whole, which grew by 15 percent since 2000 and 10 percent since 2010.

Most of San Leandro's growth since the year 2000 has been the result of increasing household size rather than new construction. The average number of persons in a San Leandro household grew from 2.6 in 2000 to 2.7 in 2010, continuing a trend underway since 1990, when average household size was just 2.33. Average household size has approximately leveled off since 2010, but population growth continues to outpace the establishment of new households. Since 2010, San Leandro has added approximately 5,000 new residents but only 700 new households.

San Leandro has become much more ethnically diverse over the past two decades. The percentage of non-Hispanic White residents in the City declined from 79 percent of the City's population in 1980 to 21 percent in 2019. Based on the 2019 American Community Survey, San Leandro's population is 34 percent Asian, 28 percent Hispanic (14 percent Hispanic white and 13 percent Hispanic nonwhite), 21 percent non-Hispanic White, 12 percent African American, and 7 percent other races or multiracial. Approximately 57 percent of San Leandro residents primarily speak a language other than English at home.

The City experienced remarkable growth in its youth population during the 1990s, with a 36 percent increase during the decade. The rate slowed to about 9 percent in 2000 to 2010. Nineteen percent of San Leandro residents are 18 years or younger. In 1990, nearly one in five San Leandro residents was over 65. That percentage began to decline in the 1990s, and the percentage of seniors now stands at 15.1 percent of the population. The median age in the City is 40.7, up from 37.5 in 2010 and 37.7 in 2000.

In recent years, the fastest growing segment of the population has been the 45 to 64 cohort, which comprised 25 percent of the population in 2010 and 30 percent in 2019. A substantial increase in the senior population is anticipated as the "baby boomer" generation advances. The "millennial" generation is somewhat underrepresented in San Leandro, with persons aged 25 to 39 comprising 22 percent of the population, compared to 24 percent in Alameda County.

Median household income has increased steadily since 2000, from $51,081 in 2000 to $62,609 in 2010 and $78,003 in 2019. The discrepancy in median income between San Leandro and Alameda County has widened in the past decade. In Alameda County, median income was $69,384 in 2010 and $99,406 in 2019. As of 2019, approximately 7 percent of San Leandro families were in poverty. The cost of housing can be particularly vexing for lower-income families, with 36 percent of families paying more than 30 percent of their income on housing.

San Leandro is more affordable than other East Bay communities but has experienced dramatic swings in housing costs in the last 15 years. Between 2001 and 2010 median home value nearly doubled, from $330,000 to $509,400. While the rise of housing prices has slowed since then, between 2010 and 2019 median home value increased to $606,800. Likewise, the median rent for a one-bedroom apartment rose from $1,000/month in October 2011 to $2,100 in October 2015, then declined to approximately $1,351 in 2019. Roughly 55 percent of the dwellings in San Leandro are occupied by owners and about 44 percent are occupied by renters.

San Leandro has a diverse economy, with a substantial number of jobs in manufacturing, wholesaling, retail, office, hospitality, health care, construction, and personal and professional service sectors. During the postwar area, the City invested in infrastructure to support significant industrial growth. Tax revenues from this strong industrial base enabled the City to maintain a relatively low tax rate and provide a high level of municipal services.

The City has long recognized that its economic health was linked to a favorable balance between the number of jobs and housing units in the community. In 2017, there were about 0.53 jobs for each employed resident in the city, indicating that most San Leandro residents work in other cities. Looking to the future, the City strives to reduce "external" work trips and create a community where residents can find jobs within the City, and employees can find housing without long commutes.

San Leandro's rich alluvial soils and temperate climate support a wide variety of plants and animals. Wetlands in the southwest part of the City provide habitat for the Salt Marsh Harvest Mouse and other special-status species. San Leandro Creek remains one of the few waterways in the urbanized East Bay that retains its natural character along most of its course. Elsewhere in the City, street trees, parks, large yards, and other open spaces provide both aesthetic and environmental benefits. Just beyond the eastern city limits, thousands of acres of grasslands, woodlands, and coastal scrub are protected in regional park and watershed lands. These open spaces have great environmental importance and scenic value and are a significant amenity for San Leandro residents.

San Leandro is enriched by its active ~~and~~ downtown and easy access to coastal amenities.

The City's environment is vulnerable to the impacts of urban development, particularly air and water pollution. Air quality in the region has improved significantly in the last 30 years, but transportation emissions still result in ozone and particulate levels that exceed State and federal standards. Burning of fossil fuels—whether through motor vehicles, industry, or energy generation—also generates GHGs, which contribute to global climate change.

During the next 100 years, the western shore of San Leandro will be affected by rising sea level, with increased frequency of flooding and higher water levels in wetlands and tidal areas. The City will need to adapt to this reality, making its shoreline more resilient and regulating the character of construction in vulnerable areas. Climate change may also result in more severe storms, changes in habitat, reduced potable water supply, and greater temperature extremes.

GUIDING PRINCIPLES

The City of San Leandro prepared this CAP in accordance with a set of principles that are globally applicable to climate action planning work. These principles include a comprehensive and integrated approach that is ambitious while also being relevant and actionable, an engagement effort that is fair and inclusive, and analyses and reports that are evidence-based, transparent, and verifiable. Beyond these principles, this CAP is centered around the principle of equity, which is central to the community members of San Leandro.

Statement of Land Acknowledgement

We acknowledge that this work occurs in ~~Huchiun~~ Jalquin/Irgin,[23]~~,~~ on unceded Lisjan territory, the ancestral homelands of the Chochenyo-speaking Ohlone people. The Confederated Villages of Lisjan is one of the many Ohlone tribes that lived for hundreds of years on the land now known as the East Bay of the San Francisco Bay Area. The Lisjan are made up of the seven tribes who were forcibly removed from their lands: Lisjan (Ohlone), Karkin (Ohlone), Bay Miwok, Plains Miwok, Wappo, Delta Yokut, and Napian (Patwin). Their territory includes Alameda, Contra Costa, Solano, Napa, and San Joaquin counties, and they are directly tied to the "Indian Town" census of the 1920s and the Verona Band.

As part of centering equity and justice in climate action, we are uplifting Indigenous wisdom and connection to the land. It is important not only to acknowledge the history of violence against Indigenous people, and their resilience to survive these acts, but also to recognize that Ohlone people are alive and flourishing members of the San Leandro and broader Bay Area communities today. We uplift Indigenous cultural practices and traditions as critical solutions to the climate crisis. In moving forward together with Indigenous people, we hope to begin rematriating the land and healing our communities.

Why the City Centers Equity and Justice

Climate change is a complex threat that aggravates the existing social inequities within society today. Systemic racism and classism result in increased vulnerability to climate hazards and decreased capability to adapt for people of color, immigrants, refugees, and lower-income residents, often referred to as frontline communities. Many of these inequities are a direct result of government policy and decision making. It is necessary to address the systemic changes and broadly lead with racial and social justice. Local governments can best support communities by ensuring an equitable, community-driven planning process that empowers those most impacted to take part in decision making, fairly distributing benefits and burdens of climate action, and addressing these systemic factors for long-term social change. As described later, the City of San Leandro Sustainability Office started sowing these seeds through strong relationships and partnership building in the community to ensure that all voices are heard, and benefits get to people who need them most.

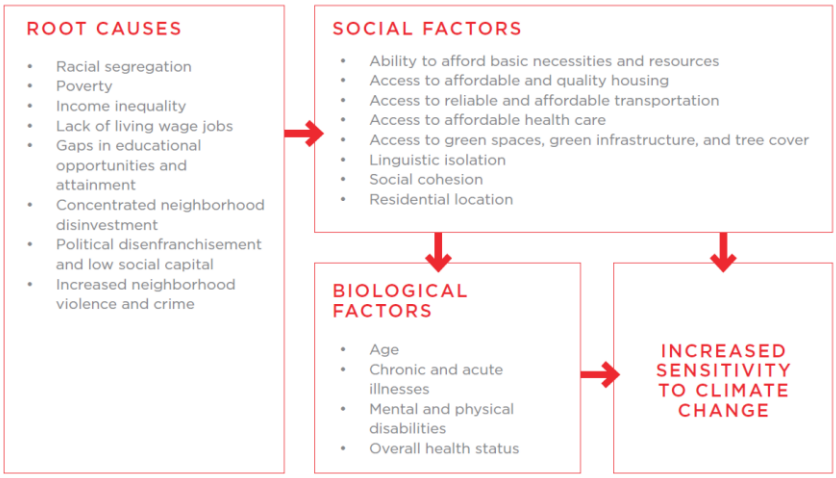
Social Inequities and Climate Vulnerability

Race is a major determinant of life quality and outcomes, and in the United States, it is tied to income and wealth. Since race impacts resource access and health conditions, it is a reliable predictor for climate vulnerability and risk. Historically and currently, institutions and structural systems drive and perpetuate inequitable distribution of resources, access to opportunities, and poor life outcomes that many frontline communities face. Examples include San Leandro's history as a sundown town,[24] redlining,[25]exclusionary housing policies, forced removal of Indigenous communities, and Jim Crow segregation. Not only did these policies exacerbate the wealth and income gap between white families and families of color, they also resulted in a greater number of lower-income and communities of color living in areas at greater risk of climate impacts such as flooding, urban heat islands, and poor air quality. Furthermore, the lack of financial resources and existing infrastructure such as affordable public transit or green spaces may increase challenges for frontline communities to respond to or cope with climate events, as shown in **Figure 2**. This puts frontline communities in a bind—the communities most vulnerable to climate change are least likely to have resources to adapt to climate change.

In addition to these patterns, recent increases in immigrant populations in San Leandro without significant increase in language access support points to gaps in people's ability to voice their concerns and get needs met.[26] Many in the Asian and Latinx communities distrust government institutions based on cultural trauma and past experiences in their ancestral lands. Such distrust can make it difficult for communities to access certain resources and information.

Many of these systemic issues are larger than any one person or the City of San Leandro and by the nature of root causes, do not have quick fixes or simple solutions. National and State legislation, such as the Fair Housing Act and requirements for an environmental justice element in General Plans are starting points. The City has begun the process of examining its policies and developing an equity plan with a team of consultants, internal staff, and community members to address these root causes that result in heightened vulnerability to climate impacts. In addition, the City has some programming and policies focused on reaching frontline communities, such as resilience hubs, transit-oriented affordable housing development, and multilingual translation during public meetings and outreach campaigns. As the CAP implementation progresses with equity at its center, more policies and practices will be developed to help the City address these gaps. The equity frameworks described below provide a roadmap for how the City and communities can work together to identify the problem areas and come up with solutions.

Figure 2 Root Causes and Factors Affecting Sensitivity to Climate Change.



Reference: Urban Sustainability Directors' Network Guide to Equitable Community-Driven Climate Preparedness Planning, May 2017.

Equity vs. Equality

"Equity and equality are often used interchangeably, but equity and equality do not mean the same thing. Equality is about sameness—meaning that everyone receives the same thing regardless of any other factors. However, equality is only useful if everyone starts from the same place, which is often not the case. Lower-income populations and communities of color often have less access to healthy and energy-efficient housing, transit, or safe bicycling and walking routes. Equity, on the other hand, is about fairness, which is about ensuring that people have access to the same opportunities and have what they need to thrive and succeed. Equity is needed before equality can be reached. This understanding recognizes that people may have different starting points and may need different types and levels of support to flourish."

Reference: Urban Sustainability Directors' Network Guide to Equitable Community-Driven Climate Preparedness Planning, May 2017

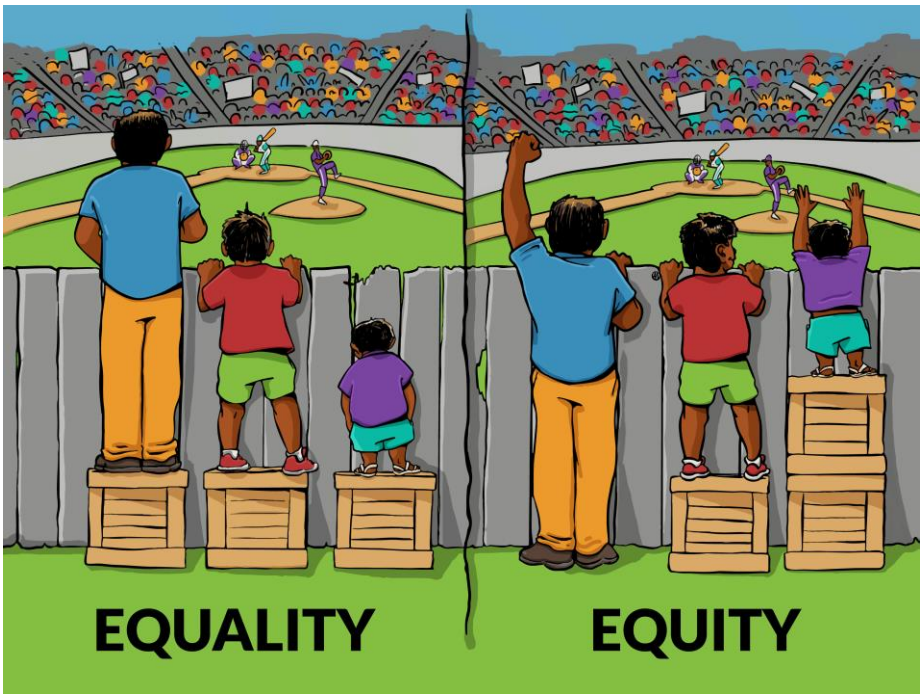


Image from Interaction Institute for Social Change | Artist: Angus Maguire

Equitable Climate Community-Driven Planning

Community-driven planning prioritizes the inclusion of frontline communities in the decisions that impact them, alongside city government and technical experts. This is seen as the first step in addressing inequities by having frontline communities identify their problems and needs, rather than being told what the problem is, and working together with help from government agencies to develop creative solutions. This ensures that issues of greatest concern to frontline communities are elevated through the process and that the analysis reflects community expertise and lived experiences. By having the community develop their vision for what they would like to see, it helps build capacity and power within the people to implement these solutions. Once community needs are identified and put into the planning process, the government then needs to ensure there is sufficient funding and other resources for implementation. More details about this best practice can be found in the National Association of Climate Resilience Planners' "Guide to Community Driven Planning."

Working toward community-driven planning takes time and involves a cyclical process of trust and relationship-building with the public, as illustrated in **Figure 43**. This relationship-building is part of accountability and healing from historical mistrust between community and government, and vital to getting buy-in for new developments and partnerships. Such work starts by strengthening the infrastructure for communities to self-organize and build a base of grassroots supporters invested in the cause of climate action, which increases their capacity for civic engagement and cross-sector coalition development. At the same time, local governments must increase access to engagement opportunities so that it is not limited to people with the time and resources to attend public meetings. This includes providing food and childcare during the meeting, choosing meeting locations near public transit or during existing community events, and seeking multi-lingual interpretation. The City planned the first in-person CAP community workshop with these considerations in mind and offered childcare; dinner; a bicycle, pedestrian, and transit-accessible location; and interpretation in Chinese and Spanish. It is also important for City staff and partners to find ways to reach out to groups and individuals who do not typically participate in planning processes and incorporate innovative techniques for engagement.

Figure 43 Engine of Climate Resilience Planning

Reference: The Guide to Community Driven Planning from the National Association of Climate Resilience Planners and Movement Strategy Center, 2017.

Equitable Climate Solutions and Just Transition

The development of equitable climate solutions must address both short-term and long-term needs. Short-term strategies that prepare communities and reduce hazard vulnerability are more effective when coupled with long-term actions that address institutional and structural inequities that are sources of increased climate risk in frontline communities. Addressing social inequities helps to develop community resilience to climate change.

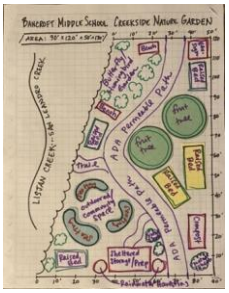
In the long term, San Leandro must work toward a just transition and root causes of the climate crisis. The just transition comes from the labor and environmental justice movement and refers to the transition away from the extractive profit-driven economy and culture to one that is ecologically sustainable, just, and equitable for all members of society. A central theme is moving away from fossil fuels to renewable energy and the need to create sustainable green jobs for workers, particularly those in the fossil fuel industry. Distribution of resources and climate action benefits to people based on the greatest unmet need is critical to ensuring all people can equitably participate in the new regenerative economy.

The City assessed the strategies proposed in this Climate Action Plan for their equity impact both in the short-term and long-term, using best practice guidance from leading climate policy organizations. City staff and community partners working on the project implementation will use these assessments to determine priority needs and methods for moving forward.

Case Study: Planning for a Garden

In November 2020, the City of San Leandro held a virtual design charrette series for a proposed community garden and outdoor education lab space at Bancroft Middle School, which is adjacent to San Leandro Creek. The lab space will improve accessibility and hands-on educational opportunities for students and community members looking to learn about watershed ecology, gardening, and Indigenous history, as well as provide a space for creek groups to host educational public tours for residents. The on-site community garden will expand access to local food production.

The workshops were held in partnership with the San Leandro Unified School District; Friends of the San Leandro Creek; Sogorea Te' Land Trust, a local Native American land rematriation group; StopWaste; Madison Park Academy, a middle school in Oakland; and the David R. Brower-Ronald V. Dellums Institute for Sustainable Policy Studies and Action. These intergenerational events brought together youth leaders, parents, and elders from the neighborhood, and allowed for cross-pollination of ideas. The design charrette was a catalyst for community collaboration, serving as an energizing first step in a formal and community-driven design process.



The City of San Leandro has continued to work with the project partners to develop the proposed community garden, associated school curriculum, and public education around ecology and sustainability. StopWaste's Earth Day 2021 kickoff event featured San Leandro youth leaders who participated in the workshop series and showcased some of the waste and permaculture science curriculum inspired by this work.

Opportunities with Climate Action

While the challenge of climate change is daunting, there is a huge capacity for City policies to influence GHG emissions, particularly considering that the majority of the world's population resides in urban areas. Major areas of action include green buildings, renewable energy, transportation, and waste management. Simply recording building energy performance against national energy rating standards can result in average annual energy savings of 2.4 percent. Cities can help negotiate renewable power purchasing agreements with local utilities as well as offer incentives for installing solar panels and wind turbines in the residential and commercial sectors. Similarly, cities' decisions to switch to electric public vehicles and buses, offer more electric charging stations, conduct smart transportation planning, and provide greater access to mass transit can alleviate GHG emissions from private driving in the transportation sector. Increasing waste diversion and reducing consumption also contribute significantly to emission reductions.

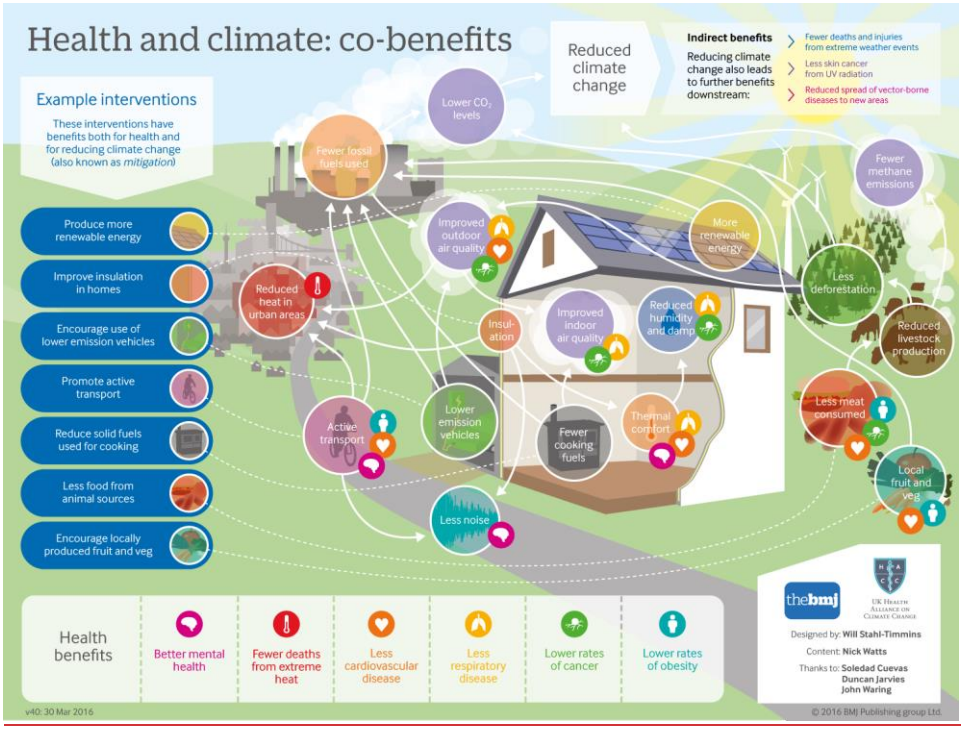
There are numerous benefits to taking action now on this. By implementing such climate action strategies, we not only help reduce global GHG emissions and slow climate changes, but on the local scale we also see:

- Better air quality and improved human health.
- Reduced urban heat island.
- More green space and conservation of natural lands.
- New jobs and greater reinvestment in the local economy.
- Lower energy and water bills.
- Shorter commute times between home, work, and school and more opportunities for people to walk, bike, or take public transit.
- More resilient and connected neighborhoods and communities.
- Less damage to social and environmental systems from drought, floods and fire, and fewer disruptions in services.
- Improved energy, water, and food security.

It is particularly important to note the strong connection between health benefits and climate action, detailed in **Figure 4**.

Figure 4 Health and Climate: Co-benefits

Mitigating and adapting to climate change can create numerous benefits for community health. Additionally, many measures for improving community health, such as promoting active transportation, also have positive effects on the environment. Image from the BMJ.



San Leandro Arch.

CLIMATE ACTION REGULATORY FRAMEWORK

State of California

California law first directly addressed climate change in 1988, when Assembly Bill (AB) 4420 directed the State to prepare a GHG inventory and study the impacts of climate change. Since then, California has adopted several laws to assess climate change, analyze GHG emissions and their effects, reduce emissions, and prepare for the impacts of climate change. Many of these laws and associated regulations affect local governments, although only some create specific requirements for individual communities.

Executive Order S-03-05 and Assembly Bill 32 – California Global Warming Solutions Act of 2006

In 2005, former Governor Schwarzenegger issued Executive Order S-03-05, which established the first statewide GHG reduction goals for California: reduce emissions to 2000 levels by 2010, reduce emissions to 1990 levels by 2020, and reduce emissions 80 percent below 1990 levels by 2050.

AB 32, the California Global Warming Solutions Act, was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce GHG emissions to 1990 levels by 2020, codified in Executive Order S-03-05. AB 32 also directed CARB to identify early action items that could be quickly implemented, to develop a scoping plan to identify the most technologically feasible and cost-effective strategies to achieve the 2020 target, and to create and adopt regulations requiring major emitters to report and verify their emissions.

The Climate Change Scoping Plan (adopted in 2008 and updated in 2014 and 2017) employs a variety of GHG reduction strategies that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program. The plan identifies local governments as strategic partners to achieving the State goal and translates the reduction goal to a 15 percent reduction of "existing" emissions by 2020. Although "existing emission levels" is not formally defined by the Scoping Plan, agencies throughout California have often interpreted it as referring to emissions occurring between 2005 and 2008. San Leandro's GHG reduction strategies have used 2005 emissions as the "existing" level to inform the 2020 target. The Scoping Plan recommends that local governments adopt per-capita targets for post-2020 GHG reduction efforts. It proposes a 2030 target of emissions equivalent to 6.0 metric tons of CO_2 ($MTCO_2e$) per person, and a 2050 target of 2.0 $MTCO_2e$ per person.

Senate Bill 375 – Sustainable Communities and Climate Protection Act of 2008

Senate Bill (SB) 375 builds off AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires metropolitan planning organizations to create a sustainable communities strategy (SCS) in their regional transportation plans for reducing urban sprawl. Each SCS will demonstrate strategies the region will use to achieve the GHG emissions reduction target set by CARB for 2020 and 2035. In 2013, the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) adopted Plan Bay Area, consisting of both the region's first SCS and the 2040 Regional Transportation Plan. In 2017, MTC and ABAG adopted an updated version of Plan Bay Area. A second update is in progress and is scheduled for adoption in 2021.

Executive Order B-30-15 and Senate Bill 32

In 2015, former governor Jerry Brown signed Executive Order B-30-15, which directed State agencies to take several steps to reduce statewide GHG emissions and adapt to changing climate conditions. One section of this executive order set a GHG reduction goal for the State of 40 percent below 1990 levels by 2030. In 2016, SB 32 was passed, codifying this GHG reduction goal into law as an official State target.

Executive Order B-55-18

In 2018, Governor Brown issued Executive Order B-55-18, which established an additional statewide goal of achieving carbon neutrality (no net GHG emissions) by 2045. Under this goal, any GHGs that are emitted by California must be fully offset by other activities by 2045. While this goal does not yet have the force of law, it does indicate the direction that the State is moving in and may be a reference point for future legislative action.

Other state-level climate actions measures include Title 24 energy efficiency standards for new and significantly renovated buildings, the Renewable Portfolio Standard, Clean Car

Standards, Low Carbon Fuel Standard, and Innovative Clean Transit Regulations, described in detail in Chapter 4.

A San Leandro streetscape.

California Environmental Quality Act

CEQA requires that many proposed development projects conduct an environmental review to identify how the project may impact the environment. SB 97 directed the Governor's Office of Planning and Research to amend the State CEQA Guidelines to address GHG emissions, requiring proposed projects to analyze their GHG emissions and contribution to climate change. The Office of Planning and Research adopted the CEQA Guidelines in December 2009, and they went into effect March 18, 2010. The guidelines include provisions for local governments to use adopted plans for the reduction of GHG emissions to address the cumulative impacts of individual future projects on GHG emissions (see State CEQA Guidelines Section 15183.5(b)(1)).

Consistent with the State CEQA Guidelines, lead agencies may use adopted GHG reduction plans to assess the cumulative impacts of discretionary projects on climate change. In addition, the CEQA Guidelines provide a mechanism to streamline development review of future projects.

Specifically, lead agencies may use adopted plans consistent with State CEQA Guidelines Section 15183.5 to analyze and mitigate the significant effects of GHGs under CEQA at a programmatic level by adopting a plan for the reduction of GHG emissions. Later, as individual projects are proposed, project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review in their cumulative impact analysis. Project-specific environmental documents prepared for projects consistent with the General Plan and the CAP may rely on the programmatic analysis of GHGs in this document.

A project-specific environmental document that relies on this CAP for its cumulative impacts analysis must identify specific GHG reduction strategies applicable to the project and demonstrate the project's incorporation of the strategies. Project applicants and City staff will identify specific strategies applicable to each project during project review. If applicable strategies are not otherwise binding and enforceable, they must be incorporated as mitigation strategies for the project. If substantial evidence indicates that the GHG emissions of a proposed project may be cumulatively considerable,

notwithstanding the project's compliance with specific strategies in this CAP, an Environmental Impact Report (EIR) must be prepared for the project.

This 2021 CAP meets the CEQA Guidelines and commitments, as follows:

- Quantifies emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- Establishes a level, based on substantial evidence, below which the contribution of emissions from activities covered by the plan would not be cumulatively considerable. This CAP identifies three ~~targets~~GHG reduction goals, consistent with State guidance and provides substantial evidence for achievement of the 2020 and 2030 reduction goals consistent with adopted State targets and a pathway to continue and accelerate reductions beyond 2030 toward the City's aspirational 2050 goal.~~:~~
  ~~— Reduce emissions to 25 percent below 2005 levels by 2020~~
  ~~— Reduce emissions to 40 percent below 2005 levels by 2030~~
  ~~— Reduce emissions to 80 percent below 2005 levels by 2050~~
- Identifies and analyzes the emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specifies strategies or a group of strategies, including performance standards that, if implemented on a project-by-project basis, substantial evidence demonstrates they would collectively achieve the specified emissions level.
- Establishes a mechanism to monitor the Plan's progress toward achieving specific levels and to require amendment if the plan is not achieving those levels.
- Includes an environmental review of the CAP in the form of an Addendum to the General Plan Environmental Impact Report.

Bay Area Air Quality Management District

The Bay Area Quality Management District (BAAQMD) is the air district with jurisdiction over San Leandro and is responsible for planning air quality management within the Bay Area.

Released in 2017, the latest update to BAAQMD's Clean Air Plan provides a regional strategy to protect public health and the climate via continued progress toward all State and federal air quality standards, and to eliminate health risk disparities from exposure to air pollution among Bay Area communities. The Clean Air Plan defines a vision for transitioning the region to the post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050 and provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets.

The 2017 Plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as particulate matter, ozone, and toxic air contaminants; to reduce emissions of methane and other GHGs that are potent climate pollutants in the near-term; and to decrease emissions of carbon dioxide by reducing fossil fuel combustion.

BAAQMD's Climate Protection Planning Program is a comprehensive planning effort to reduce the air district's GHG emissions to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. In 2018, the Climate Protection Grant Program awarded $4.5 million to 17 projects at 15 regional public agencies in two programs areas: reducing GHGs from existing and fostering innovative strategies to long-term GHG reduction. Grants were awarded to Alameda County Waste Management Authority and East Bay Clean Energy, among others.

City General Plan

San Leandro adopted a comprehensive update to its General Plan in 2017. The General Plan is a comprehensive blueprint that lays out the community's approach to growth and development activities through the year 2035. The General Plan also serves as a framework for the CAP, providing overarching direction for the City to address climate change. This overarching direction includes:

- Goal OSC-8: Promote the efficient use of energy and the increased use of renewable energy by San Leandro residents and businesses.
- Policy EH-6.11: Prepare for the weather-related impacts of climate change, such as more frequent extreme weather events, temperature extremes, and prolonged drought.
- Policy T-5.8: Plan for a substantial increase in the number of electric vehicles and other low-emissions or zero-emission vehicles on city streets.

The CAP acts to implement the General Plan, providing specific policies and actions to achieve comprehensive GHG reduction and climate adaptation activities in San Leandro in a manner consistent with the General Plan's overall path for the community.

CLIMATE ACTION PREPARATION PROCESS

Staff from the City of San Leandro Sustainability Office led preparation of this 2021 CAP update. Members of the San Leandro Green Team, a group of staff from several City departments who meet regularly to discuss and work on sustainability issues, provided critical review and feedback of work during the process. The consulting firm PlaceWorks provided technical support for the CAP update. The first phase of the CAP update process involved preparing the technical analyses that form the foundation of the CAP, including the GHG inventory and forecast and the vulnerability assessment. The project team used these analyses to identify and assess a range of GHG reduction and climate adaptation strategies that respond to the specific conditions and issues of concern in San Leandro. Following this, the project team prepared the CAP update document.

The public input process, which ran throughout the CAP update process, is intended to ensure that community stakeholders have a voice in developing the CAP. The City of San Leandro has conducted significant public outreach to educate community groups on climate protection issues, as well as to gather comments from the public.

Community Outreach

Following best practices around climate equity laid out by the National Association for Climate Resilience Planners and other leading climate justice organizations, the San Leandro Sustainability Office centered relationship-building and listening in the community outreach for the CAP update. The community and stakeholder engagement process for the 2021 CAP included in-person and virtual conversations, meetings, gatherings, games, presentations, community workshops, and online surveys and activities. The purpose of the community and stakeholder engagement for the CAP was to understand community needs and capacity, identify vulnerabilities and inequities, and build a leadership development infrastructure for community champions to collaborate with City staff on projects and planning. Since climate impacts everyone, and particularly those already impacted by systemic factors such as racism or poverty, a broad and diverse audience was sought.

Over 90 community members attended the CAP update kick-off meeting in February of 2020.

San Leandro residents play the climate board game, Game of Extremes, in January 2020.

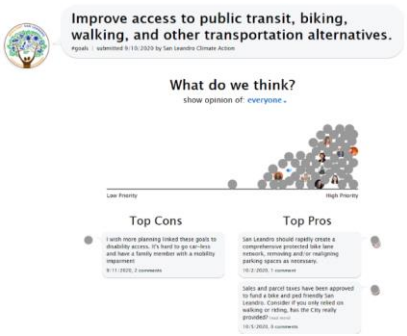
From September 2019 to December 2020, the Sustainability Office participated in nearly 150 in-person and virtual small group meetings, one-on-one meetings, and presentations to community groups to introduce the City's Sustainability Office, climate action program, and the CAP update. The bulk of these were held in the first six months. Audiences included parent associations, labor alliances, faith groups, elementary and high school students, service clubs, indigenous leaders, climate and bicycling organizations, disability advocates, businesses, and more. For organizations with closer partnerships with the Sustainability Office, checking in over the course of the year helped strengthen the relationship and understand how best to collaborate.

Prior to the first community workshop, the City's Sustainability Office invited San Leandro community members to participate in an online survey and a climate board game. The City hosted an online survey from November to December 2019 and received responses from 195 participants. Respondents identified many climate priorities and concerns. In response to questions about the PG&E public safety power shutoffs (PSPS) and wildfire smoke, there were significant comments around smoke health impacts, anxiety and uncertainty about anticipated outage events, disruptions to daily life, concerns for elders and caretaking, and mental health impacts. Survey respondents identified cleaner air, healthier homes and lifestyles, protection of water and food resources, and prevention of future extreme events as top climate benefits, indicating a solid communication strategy around public health for future messaging. Finally, respondents requested more community education sessions, encouragement around smaller actions for cultural shifts, strong community partnerships, community volunteer opportunities, climate-related infrastructure and incentives, and timely City communications. The results of the online survey are summarized in Appendix A.

The climate board game, *Game of Extremes*, was developed by the Urban Sustainability Directors Network to educate community members about the climate adaptation planning process in an interactive, hands-on way. The Sustainability Office successfully facilitated the climate board game for 5th graders at Monroe Elementary and the Environmental Science classes at San Leandro High School in December 2019. In addition, the Sustainability Office organized a session for the public in January 2020, and 18 community members attended.

The City hosted the first community workshop to officially kick off the CAP in person on February 20, 2020, with over 90 community members in attendance. Staff from the Sustainability Office and PlaceWorks, the City's technical consultant on the CAP update, gave a presentation overview of the CAP update process, what had been achieved thus far, and what was expected for the following months. Community members then broke into discussions at their tables, facilitated by Green Team members, about their primary concerns and suggestions around major climate sectors. Chinese and Spanish

interpretation, childcare, and dinner were provided for accessibility. Community members provided a wide range of feedback on the meaning of community resilience, big ideas to reduce GHG emissions, and specific thoughts on several topics related to GHG emissions and climate adaptation. Common statements included upgrading existing buildings to be more energy efficient, providing greater access to public transit and other ways to reduce automobile dependency, and achieving a more equitable community.



The Consider.It platform invited community members to prioritize potential GHG reduction strategies and weigh in on the advantages and disadvantages of each.

With the COVID-19 pandemic hitting the US in March 2020, the City adjusted the CAP outreach timeline and approach. Rather than holding the second public workshop as planned in early summer, PlaceWorks and the Sustainability Office instead worked closely with the Green Team to refine the draft CAP strategies. The City uploaded the draft strategies onto an online platform, Consider.It, for the public to vote and comment on in September 2020. All of the strategies were translated into Spanish and Chinese on separate forums for accessibility. Targeted outreach was conducted to business leaders, regional agencies, and community champions. About 100 users responded across all of the forums.

The Sustainability Office continued to hold small group presentations and discussions leading up to the second public workshop, including a focus group for black, Indigenous, and youth of color, a small group session for Chinese monolingual speakers, and one-on-one meetings with developers and businesses.

The City hosted the second public workshop virtually in October 2020 using the Zoom online platform. Community partners and Green Team staff facilitated breakout rooms for specific discussions by stakeholder group. Spanish interpretation was provided. With the CAP draft policies available, the focus of the workshop was on implementation and how the community could collaborate to work on climate action together. Breakout groups were divided into faith groups, schools/youth, neighborhoods, businesses, families, and Spanish speakers and facilitated by representatives from the Interfaith Homeless Network, the San Leandro Unified School District Board, San Leandro High Eco Club, Mission Bay Mobile Home Community, Building Futures for Women and Children, San Leandro Chamber of Commerce, Community Impact Lab, and PlaceWorks, respectively. About 60 people attended the virtual workshop.

At the second workshop, community members were asked in English and Spanish to provide words that matched their vision of a climate-resilient San Leandro. The larger the word in the above word cloud, the more community members identified that word as part of their vision.

Staff Engagement

In addition to community groups, the Sustainability Office also convened with internal City staff as part of the interdepartmental Green Team, the staff group that would be responsible for implementing the completed CAP. Throughout the update process, the Green Team met bimonthly for updates and feedback on the CAP, training on specific climate topics, and cross-department sharing.

With the incorporation of community feedback into the CAP draft strategies, the Sustainability Office reviewed the strategies with the Green Team to identify their recommendations of top priorities for implementation in 2021. Anticipating the CAP adoption and transition into implementation in 2021, these recommended priorities are proposed as the staff workplan for the first year of implementation.

Chapter 2 of this document describes the results of the GHG inventories carried out for the City of San Leandro for the years of 2005 and 2017, as well as estimates for the City's GHG emissions in 2020, 2030, and 2050. This work provides a foundation that allows the community to see how its emissions have changed over time and chart progress toward State and local emissions reductions targets, informing emissions reductions strategies.

Case Study: Resilience Green Business Program

San Leandro is a member of Alameda County's Green Business Program, a county-wide program which verifies that businesses meet higher standards of environmental performance. More than 400 Alameda County businesses and public agencies have been certified as green businesses. One such business is Scandic Springs, Inc., a custom metal stamping and spring coiling manufacturer that prides itself on sustainability.

As a testament to San Leandro's manufacturing history, Scandic Springs, Inc. is approaching 50 years within San Leandro's manufacturing community. Drawn to San Leandro for its proximity to the talented workforce and key customers, Scandic Springs, Inc.'s president Hale Foote has made sustainability a cornerstone of his business. "It is good business practice, and it is good for the environment. It means operating my business in a way that consumes the least resources necessary, making products that have a neutral or beneficial effect on the environment (such as parts for EV cars, LED lighting, solar panel mounting, and more)."

One of the most visible changes Foote has made to the business is to install a solar roof, which resulted in immediate savings. But the combination of other initiatives, like recycling and motor controls, also added up to significant financial savings as well. Some of these include:

- Installing a 93-kW photovoltaic system which supplies almost all the of the businesses' electrical needs.
- Installing a closed-loop filtration system for the waterjet.
- Conducting wastewater treatment with an evaporator, the small residue of which is sent to an authorized treatment center.
- Recycling all scrap metal, sorted by alloy (8,000 pounds per month).
- Using lubricants and cleaning agents that are approved for on-site neutralization and disposal.
- Installing skylights throughout the facility to lower lighting costs.
- Retrofitting most motors with variable frequency drives for lower power consumption; and
- Providing flexible work hours to allow employees to avoid rush hour traffic, saving fuel, time, and money.

In addition to environmental sustainability, Scandic Springs, Inc. promotes well-being and sustainable jobs for their employees. They have internal and external apprenticeship programs to increase skills and offer a 100% tuition reimbursement program for employees looking to take college-level classes. For other businesses looking to become greener, Foote recommends: "Look at the economic benefits to operating in an environmentally conscious way. It is less expensive to run your business with a view towards sustainability, when you factor in all short- and long-term costs."

Scandic Springs, Inc.'s solar panel array.

2. GHG Inventory and Forecast

BACKGROUND

A GHG inventory is a summary of the GHG emissions generated by activities that take place within a community. In some instances, the emissions may be emitted within the jurisdiction, such as emissions from a car being driven within the community's boundaries. In other cases, the emissions may occur elsewhere but are included in the inventory because the activity responsible for generating the emissions took place within the jurisdiction, such as a community member using electricity generated by a power plant in another part of California. Inventories help elected officials, City staff, and members of the public to understand what activities generate GHG emissions.

The GHG emissions inventory and forecast lay the groundwork for the 2021 CAP, which seeks to align the City's GHG reduction efforts with State-recommended targets. The City is committed to achieving emissions reductions of 40 percent below 2005 levels by 2030 and 80 percent below 2005 levels by 2050.

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. The inventory assesses the GHG emissions from activities within San Leandro or associated with the activities of San Leandro community members, not the GHGs that are emitted within the city limits. For example, although the electricity used by San Leandro's residents and businesses is mostly produced elsewhere, the GHG emissions associated with it appear in San Leandro's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take ownership of the impacts associated with its resource use and behavior, regardless of whether the emissions occur within the geographical limits of the community.

GHG INVENTORY

Protocols and Guidance

The GHG inventory reflects the GHG emissions associated with everyday activities in the community of San Leandro, such as the electricity used in homes, miles traveled in vehicles, and waste sent to landfills. The results of the inventory are used to set reduction targets and calculate projections of future GHG emissions.

GHG accounting represents an emerging field of science that continually benefits from refinements in best practice and emergence of new information. Organizations in California and throughout the United States have established protocols to assist and guide communities in assessing GHG emissions from government operations and community activities. While these protocols are not regulatory, they identify relevant sources or activities, recommend methods to estimate GHG emissions from each source, and provide

consistency in the identification, assessment, and presentation of emission results across multiple jurisdictions.

In California, and as recommended by the Governor's Office of Planning and Research, many communities use the 2012 US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, commonly referred to as the US Community Protocol, to identify and assess community activities. The Protocol provides guidance on how to measure and report community-wide GHG emissions, including identification of relevant sources or activities methods to estimate GHG emissions from each source, and consistency in the identification, assessment, and presentation of emissions results across multiple jurisdictions.

The City's community-wide GHG inventory was prepared using protocols and best practices identified within the US Community Protocol, supported by methods in the Local Government Operations Protocol (LGOP) v. 1.1, where appropriate. As part of the GHG emissions accounting process, the City updated the 2005 GHG inventory to reflect current best practices.

RESULTS

The community-wide inventories include the following sectors:

- **Energy:** Electricity and natural gas used in residential and non-residential settings (e.g., industrial, commercial), including direct access electricity.
- **Transportation:** On-road vehicle trips on local roads and state highways from both passenger and commercial vehicles.
- **BART:** Emissions generated from BART trips.
- **Off-Road**: The use of portable equipment and vehicles that do not travel on roads (e.g., construction or lawn and garden equipment).
- **Waste:** Material produced by the community that is deposited in landfills and that decomposes and produces methane.
- **Water and Wastewater:** Energy used to treat and pump water used and wastewater created, along with emissions from the processing of wastewater.
- **Biomass Sequestration:** GHG emissions absorbed by natural lands and trees in San Leandro. Since emissions are removed from the atmosphere, the values of this sector are negative. This is an informational item and is not included in the community totals.

The CAP presents some GHG emissions in both absolute (total) and per-capita (emissions per resident) levels.

Baseline Year 2005

In the base year 2005, the City of San Leandro emitted approximately 720,990 $MTCO_2e$. Transportation was the largest contributor to community emissions, emitting approximately 50 percent of the City's total. Transportation was followed by non-residential energy, which was responsible for 25 percent of emissions, followed by residential energy, which constituted approximately 14 percent of emissions. Waste was the fourth-largest sector, comprising 7 percent of community-wide emissions, followed by off-road emissions (3 percent) and BART (less than 1 percent). Water and wastewater data were not available for 2005. Table 1 and **Figure 5** show the 2005 GHG emissions.

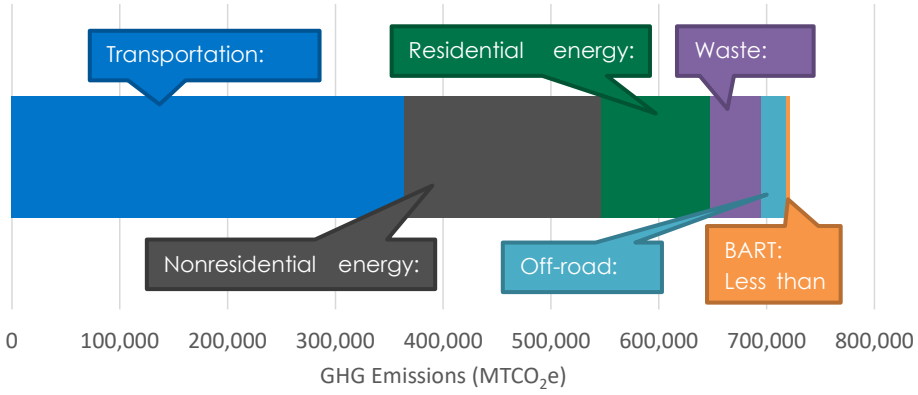
Table 1 San Leandro Community GHG Emissions, 2005

Sector	GHG Emissions ($MTCO_2e$)	Percentage
Transportation	363,550	50%
Nonresidential energy	182,950	25%
Residential energy	101,460	14%
Waste	46,910	7%
Off-road	23,190	3%
BART	2,920	Less than 1%
Water and wastewater	-	-
Total	**720,990**	**100%**
Biomass sequestration *	*-530*	-

* Informational item not included in the community total.

Due to rounding, the total value may not equal the sum of individual rows.

Figure 5 Community Emissions, 2005



Interim Emissions

In addition to the 2005 GHG inventory, the City prepared community-wide GHG emissions for the years 2010, 2015, and 2017. These interim years show changes to GHG emissions since the 2005 baseline.

GHG emissions have declined steadily from 2005 levels. In 2017, GHG emissions totaled 573,580 $MTCO_2e$, a decrease of 20 percent from 2005. GHG emissions from energy, transportation, waste, and water and wastewater declined. The decrease in non-residential energy is a combination of sources of electricity being much cleaner in 2017 than in 2005, although there was also a significant decline in non-residential natural gas use that may be a result of changing economic activities or differences in PG&E reporting. The decline in residential energy use is primarily the result of cleaner electricity sources. Emissions associated with solid waste declined due to reductions in trash being thrown out, likely due to more robust recycling and composting programs as well as increasing awareness around waste reduction. BART and off-road emissions increased, likely a result of San Leandro's growing population, higher rates of construction activities, and increased BART ridership. Table 2 shows the change in GHG emissions from 2005 to 2017, and the activity data by subsector for the four inventory years.

Table 2 San Leandro Community GHG Emissions, 2005–2017

Sector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Change in Emissions, 2005–2017
Transportation	363,550	372,220	353,130	344,290	-5%
Nonresidential energy	182,950	146,600	96,490	88,620	-52%
Residential energy	101,760	100,650	83,830	73,320	-28%
Waste	46,910	40,080	38,880	34,860	-26%
Off-road	23,190	22,860	30,940	26,970	16%
BART	2,920	3,030	3,720	3,710	27%
Water and wastewater	-	2,410	2,470	1,820	-25%*
Total	**720,990**	**687,860**	**609,460**	**573,580**	**100%**
Biomass sequestration †	-530	-530	-530	-530	0%

* From 2010 to 2017

† Informational item not included in the community-wide total.

Due to rounding, the total value may not equal the sum of individual rows.

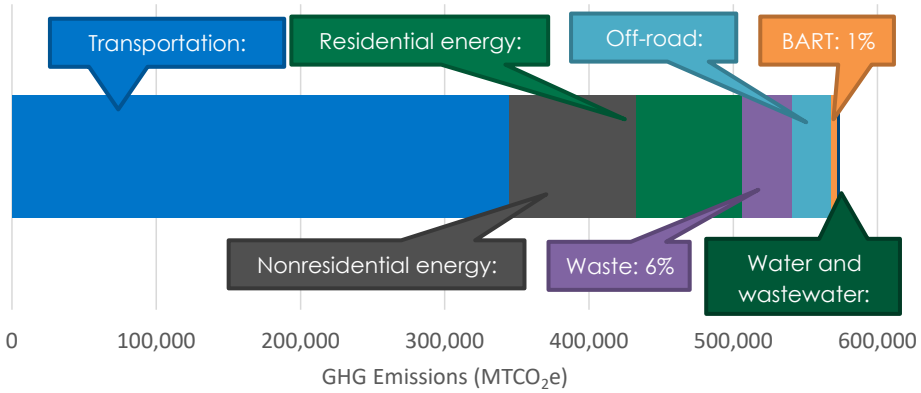
In 2017, transportation remained the largest source of GHG emissions, accounting for approximately 60 percent of the City's total. Nonresidential energy was the second-largest source of GHG emissions, equaling approximately 15 percent of the community total, followed by residential energy at 13 percent. Waste was the fourth-largest source of GHG emissions at 6 percent of the community-wide total, followed by off-road (5 percent), BART (1 percent), and water and wastewater (less than 1 percent), as shown in Table 3 and **Figure 6**.

Table 3 San Leandro Community GHG Emissions, 2017

Sector	GHG Emissions ($MTCO_2e$)	Percentage
Transportation	344,290	60%
Nonresidential energy	182,950	15%
Residential energy	101,460	13%
Waste	34,860	6%
Off-road	26,960	5%
BART	3,710	1%
Water and wastewater	1,820	Less than 1%
Total	573,580	100%
Biomass sequestration*	-530	-

* Informational item not included in the community-wide total.
Due to rounding, the total value may not equal the sum of individual rows.

Figure 6 Community GHG Emissions, 2017



Consumption-Based Inventory Emissions

The GHG inventory presented for San Leandro is a protocol-compliant, production-based inventory, which means that it assesses the GHG emissions produced by activities occurring in the community.[1] However, the inventory does not account for most of the emissions created by the consumption of material goods or use of services in San Leandro, including emissions from the manufacture and transportation of goods purchased in the community, food grown and processed in other locations, air travel by San Leandro community members, and the disposal or reprocessing of certain materials and products. For example, if a San Leandro community member purchases new clothes from a local store, the production-based inventory will include vehicle emissions for the trip to and from the store, energy use at the store and home, and any landfilled waste generated. It would not include emissions from the growing and processing of the raw materials in the clothes, the manufacturing of the clothes, transportation of the clothes to the store, or the reprocessing of any waste materials that do not end up in a landfill, unless these activities occur within the San Leandro city limits.

In contrast to a production-based inventory, a second type of GHG inventory, known as a consumption-based inventory, looks at a wider array of GHG emissions created by the goods and services used by San Leandro community members, including residents, businesses, and employees. A consumption-based inventory assesses emissions associated with the manufacture, transportation, and disposal of these goods and services regardless of where they occur. Such inventories can provide a more complete picture of the GHG emissions associated with the lifestyle and consumer behavior of San Leandro community members.

A consumption-based inventory is more complex to prepare than a production-based one. There are no established protocols and methods for consumption-based inventories, and California does not yet have a statewide consumption-based inventory or any guidance for preparing one. Due to these limitations, the project team did not prepare one as part of this 2021 CAP. In 2015, BAAQMD worked with the Cool Climate Network at the University of California, Berkeley, to prepare a consumption-based inventory for all Bay Area jurisdictions. [27] This inventory includes GHG emissions from the following sources:

- **Travel**: GHG emissions from fuel use by on-road vehicles, vehicle manufacturing and repairs, public transportation, and air travel.
- **Housing**: GHG emissions from electricity and natural gas use in homes, as well as other fuels associated with home heating (such as kerosene or fuel oil), electricity emissions

[1] Strictly speaking, the GHG inventory in this 2021 CAP is a hybrid of two different inventory methods, production-based and activity-based, but for simplicity's sake, it is referred to as a production-based inventory.

from water and wastewater activities, and waste emissions. This category also includes emissions from the manufacture, transportation, and construction and demolition of materials used to construct houses.

- **Food**: GHG emissions from the growth, processing/manufacturing, and transportation of food products.
- **Goods**: GHG emissions from the manufacture, transportation, and disposal of consumer products, such as home furnishings, appliances and electronics, clothing, and healthcare and personal items.
- **Services**: GHG emissions from personal and business services, including entertainment and recreation, communication, education, healthcare, and maintenance and repair activities.

Some of these GHG emission sources are also included in the production-based inventory prepared as part of the 2021 CAP, while others are covered either by the production-based or consumption-based inventory but not both. **Table 4** compares the sources of GHG emissions in the 2021 CAP production-based inventory and the BAAQMD/Cool Climate Network consumption-based inventory.

Table 4 Comparison of Sources in Production-Based and Consumption-Based GHG Emission Inventories

Source of Emissions	Production-based 2021 CAP Inventory	BAAQMD/Cool Climate Network Consumption-Based Inventory
Generation of electricity used	Included	Included
Combustion of natural gas used	Included	Included
Combustion of other home heating fuels used	Not included	Included
Fuel use from on-road vehicles	Included	Included
Fuel use from public transportation	Included	Included
Electricity use from BART	Included	Included
Vehicle manufacturing and repairs	Partially included *	Included
Air travel	Not included	Included
Fuel use from off-road equipment, including construction and landscaping equipment	Included	Not included
Generation of electricity used for water processing and transportation	Included	Included
Generation of electricity used for wastewater processing and transportation	Included	Unknown †
Direct wastewater process emissions	Included	Not included
Landfilling of solid waste	Included	Included
Reprocessing of recyclables	Partially included *	Included
Compost processing	Partially included *	Included
Manufacturing of home construction materials	Partially included *	Included
Food growth, processing, production, and transportation	Partially included *	Included
Carbon sequestration in forests and street trees	Included	Not included
Other embedded emissions in goods and services	Not included	Included

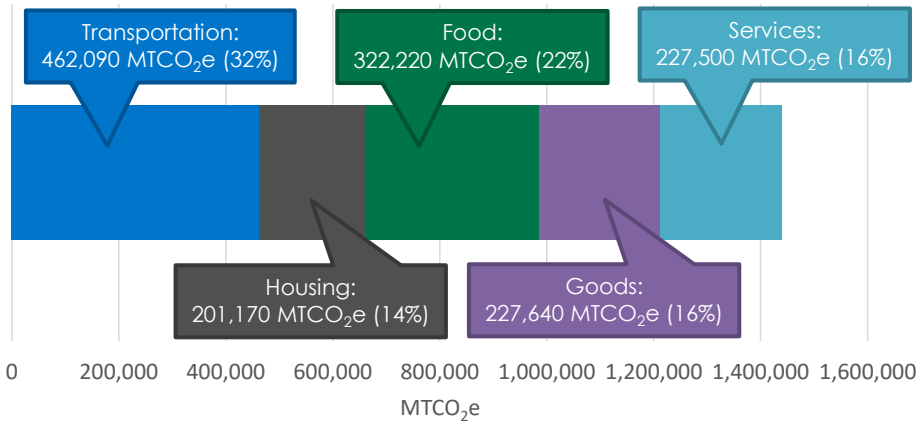
* Emissions from energy use, water use, and waste generation associated with these activities are included in the 2021 CAP Update inventory if these activities occur in San Leandro. Emissions from these activities outside of San Leandro and other emissions associated with these activities in San Leandro are not included in the 2021 CAP inventory.

† Emissions from these activities are not explicitly called out in the BAAQMD/Cool Climate Network consumption-based inventory but may be included in the total electricity use category.

Due to differences in data sources and analysis methods, the same source of emissions in both inventories may produce different results.

Figure 7 shows the 2015 consumption-based GHG emissions for San Leandro.

Figure 7 San Leandro Consumption-Based GHG Emissions (2015)



San Leandro's 2015 consumption-based GHG emissions totaled approximately 1,440,620 $MTCO_2e$. This is over twice as large as San Leandro's production-based GHG emissions in 2015, which were approximately 609,460 $MTCO_2e$. Transportation-related GHG emissions were the largest sector, accounting for 32 percent of the consumption-based GHG emissions. Food was the second-largest sector, totaling approximately 22 percent of emissions. Goods and services each accounted for 16 percent of the community-wide total, with housing being the smallest (14 percent). Details about consumption-based GHG emissions for San Leandro and other Bay Area communities, along with information about the analysis methods, are available at https://coolclimate.berkeley.edu/inventory.

This 2021 CAP does not forecast changes in consumption-based GHG emissions or identify potential reductions in consumption-based GHG emissions from the strategies listed in Chapter 4. However, since the consumption-based inventory includes many of the same sources of emissions in the production-based inventory, GHG-reduction strategies that decrease production-based emissions are expected to decrease production-based emissions as well. Some of the supportive strategies in this 2021 CAP will likely reduce consumption-based GHG emissions as well.

GHG FORECAST

A forecast of future GHG emissions helps to ensure consistency with the guidelines for a Qualified GHG Reduction Strategy put forward by BAAQMD. A forecast allows elected officials, City staff, and community members to identify the amount of GHG reductions necessary to achieve future GHG reduction targets, and it can help support long-range community planning efforts. The CAP update includes a forecast for the calendar years 2020, 2030, and 2050.

Conducting an emissions forecast is essential for developing the CAP since GHG emissions typically increase in future years as population grows without a concerted effort to implement emissions reduction projects. One must compare future reductions with future emissions levels, not current levels. Therefore, in developing the 2021 CAP, the City of San Leandro needs to take into account projected growth in emissions.

A GHG emissions forecast estimates how emissions would grow over time if no action is taken at the federal, State, or local level to reduce them. A set of indicators determines the extent of growth that could occur and how resulting emissions may change. An emissions forecast was prepared for San Leandro using the best available information regarding indicators and growth rates. The forecast relies on growth assumptions from the California Department of Finance and the Association of Bay Area Government (ABAG) that were approved by City staff, shown in Table 45. Activity data rates in the forecast, such as household energy use, vehicle miles traveled, or per person waste disposal, are based on the 2017 emissions inventory.

Table 45 San Leandro 2017, 2020, 2030, and 2050 Growth Indicators

Indicator	2017	2020	2030	2050	Percentage Change, 2005–2050	Source
Population	90,560	98,370	103,910	111,260	36%	Dept of Finance/ Census/ABAG
Households	33,460	35,150	36,180	37,720	22%	Dept of Finance/ Census/ABAG
Jobs	50,310	54,700	57,830	61,450	57%	California EDD/ US Census/ABAG
Service Population*	140,870	153,070	161,740	172,710	43%	

* Service population is the sum of the residential population and number of jobs

Each indicator is used to project future emissions for the following sectors:

- *Households*: Residential energy use, off-road equipment (lawn and garden equipment, pleasure craft, and recreational equipment)
- *Jobs*: Nonresidential energy use, commercial vehicle use, off-road equipment (entertainment equipment, industrial equipment, light commercial equipment, Transport Refrigeration Units)
- *Service Population*: Solid waste generation, BART, water and wastewater
- *Change in Service Population*: Off-road equipment (construction and mining equipment)

Residential population is not used as an indicator by itself but is combined with jobs to calculate service population. Emissions from direct access electricity (an option that allows eligible customers, usually larger industrial or institutional customers, to purchase electricity directly from third-party providers), point sources, and freight trains are held constant and are not projected to change over time. Construction and mining emissions, part of the off-road equipment sector, are forecast by the change in service population. Landfill emissions are based on decomposition rates provided by CARB and are not forecast by an indicator. Biomass sequestration is associated with the amount of forested land and level of development in San Leandro. Because the City's size is not expected to change and there are no plans to develop land currently designated as open space, the amount of GHGs absorbed by biomass sequestration is not projected to change.

The project team applied these indicators to forecast future GHG indicators. Relative to 2017 emissions, San Leandro's GHG emissions are expected to increase by approximately 21 percent by 2050 if no action is taken to reduce emissions. The forecast assumes that each person in San Leandro will continue to contribute the same amount of GHG emissions to the community's total, so that the amount of GHGs released increases in step with population growth of the community. As with the other forecast years, the 2020 forecast is a projection based on 2017 emissions and anticipated growth levels and does not reflect the impacts of the COVID-19 pandemic or any other specific measured activity in 2020. Table ~~5~~6 shows the forecast results.

Table ~~6~~5 San Leandro Community GHG Forecast, 2017–2050

Sector	2017 $MTCO_2e$	2020 $MTCO_2e$	2030 $MTCO_2e$	2050 $MTCO_2e$	Change in Emissions, 2017–2050
Transportation	344,290	374,140	395,360	421,880	23%
Nonresidential energy	88,620	96,350	101,870	108,250	22%
Residential energy	73,320	77,020	80,650	82,660	13%
Waste	34,860	37,880	40,030	42,740	23%
Off-road	26,960	38,770	34,840	30,540	13%
BART	3,710	4,030	4,260	4,550	23%
Water and wastewater	1,820	1,970	2,090	2,230	23%
Total	**573,580**	**630,160**	**659,100**	**692,850**	**21%**
Biomass sequestration *	-530	-530	-530	-530	0%

* This is an informational item that is not included in the community-wide total.
Due to rounding, the total value may not equal the sum of individual rows.

GHG REDUCTION TARGETS

The CEQA Guidelines Section 15183.5(b) requires that a Qualified GHG Reduction Strategy contains a goal for substantive GHG reductions, although the Guidelines do not set a specific level for this goal. In CARB's Climate Change Scoping Plan, the State provides its statewide GHG reductions targets (the targets for statewide emissions) and guidance for local communities. California's statewide targets are absolute levels (a set amount below a specific level), and the guidance for local communities is a mix of absolute and per-capita targets. These statewide targets are:

- 2020: Reduce emissions to 1990 levels, codified into law by AB 32 (2006).
- 2030: Reduce emissions 40 percent below 1990 levels, codified into law by SB 32 (2016).
- 2050: Reduce emissions 80 percent below 1990 levels, established by Executive Order S-03-05 (not yet codified into law).

Scoping Plan recommendations for local plan level GHG reduction goals are:

- 2020: Reduce emissions 15 percent below baseline levels (2005 to 2008 per the AB 32 Scoping Plan).
- 2030: Reduce emissions to 6.0 $MTCO_2e$ per capita.
- 2050: Reduce emissions to 2.0 $MTCO_2e$ per capita.

San Leandro has adopted locally specific GHG reduction ~~targets~~goals, which are broadly consistent with the ones recommended by the State. San Leandro's ~~targets~~ goals are:

- 2020: Reduce emissions 25 percent below 2005 levels.
- 2030: Reduce emissions 40 percent below 2005 levels.
- 2050: Reduce emissions 80 percent below 2005 levels.

The GHG inventory and forecast provided in this chapter provide an understanding of how San Leandro's emissions are expected to change in the absence of any reduction efforts. Chapter 3 highlights the impacts that GHG emissions are anticipated to have on the various communities and key infrastructures and community services in San Leandro. Chapter 4 of this CAP describes how the City intends to reduce future emissions to meet or exceed its GHG reduction targets with a focus on achievement of the City's 2030 reduction goal consistent with the State's adopted 2030 reduction target and commitment to continued and accelerated emissions reductions beyond 2030.

3. Climate Change Vulnerability Assessment

BACKGROUND

A vulnerability assessment is an analysis of how climate change is likely to affect a community. The vulnerability assessment in this CAP looks at the anticipated hazards and other public safety concerns that may be created or exacerbated by climate change and how these conditions have the potential to harm people, buildings and infrastructure, ecosystems, and other assets in San Leandro. Just as the GHG inventory and forecast provide a foundation for identifying future GHG emission reductions, the vulnerability assessment helps support future efforts to improve community resilience and adapt to changing climate conditions.

VULNERABILITY ASSESSMENT PROCESS

The vulnerability assessment primarily follows the recommended process in the *California Adaptation Planning Guide*, published in 2020 by the California Governor's Office of Emergency Services. This includes a four-step process: (1) characterizing the City's exposure to current and projected climate hazards; (2) identifying potential sensitivities and potential impacts to City populations and assets; (3) evaluating the current ability of the populations and assets to cope with climate impacts, also referred to as its adaptive capacity; and (4) identifying priority vulnerabilities based on systematic scoring. These steps are shown in **Figure ~~8~~7** and described in greater detail in Appendix B.

Figure ~~8~~7 California Adaptation Planning Guide Recommended Model

The vulnerability assessment expands on a previous vulnerability assessment, the "San Leandro Climate Hazard Assessment," prepared for San Leandro in 2017. The vulnerability assessment incorporates the results of this 2017 analysis, expanding on it and revising its conclusions where supported by new data or methods.

CLIMATE CHANGE HAZARDS IN SAN LEANDRO

San Leandro, like most communities in California, is expected to experience multiple direct impacts as a result of climate change, including potential flooding, sea-level rise (SLR), wildfires, drought, extreme heat, and negative effects on public health and biodiversity. Research suggests that California will experience hotter and drier conditions, reductions in winter snow and increases in winter rains, SLR, significant changes to the water cycle, and

an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state, with likely ramifications in San Leandro. To refrain from action is costly and risky; the California Fourth Climate Change Assessment estimates that taking no action to address the potential impacts of climate change will lead to economic losses of "tens of billions of dollars per year in direct costs" and "expose trillions of dollars of assets to collateral risk."

As the climate continues to change and GHG emissions rise, climate change hazards will continue to harm populations, infrastructures and buildings, economic drivers, and key community services in San Leandro. The 2021 CAP includes goals, policies, and strategies that will help reduce GHG emissions within the City and increase resiliency.

Figure 9 shows the SLR, flooding, and wildfire hazard areas in San Leandro, which are expected to be the hazards that may have the greatest impacts on specific locations within the community.

Bayshore Flooding

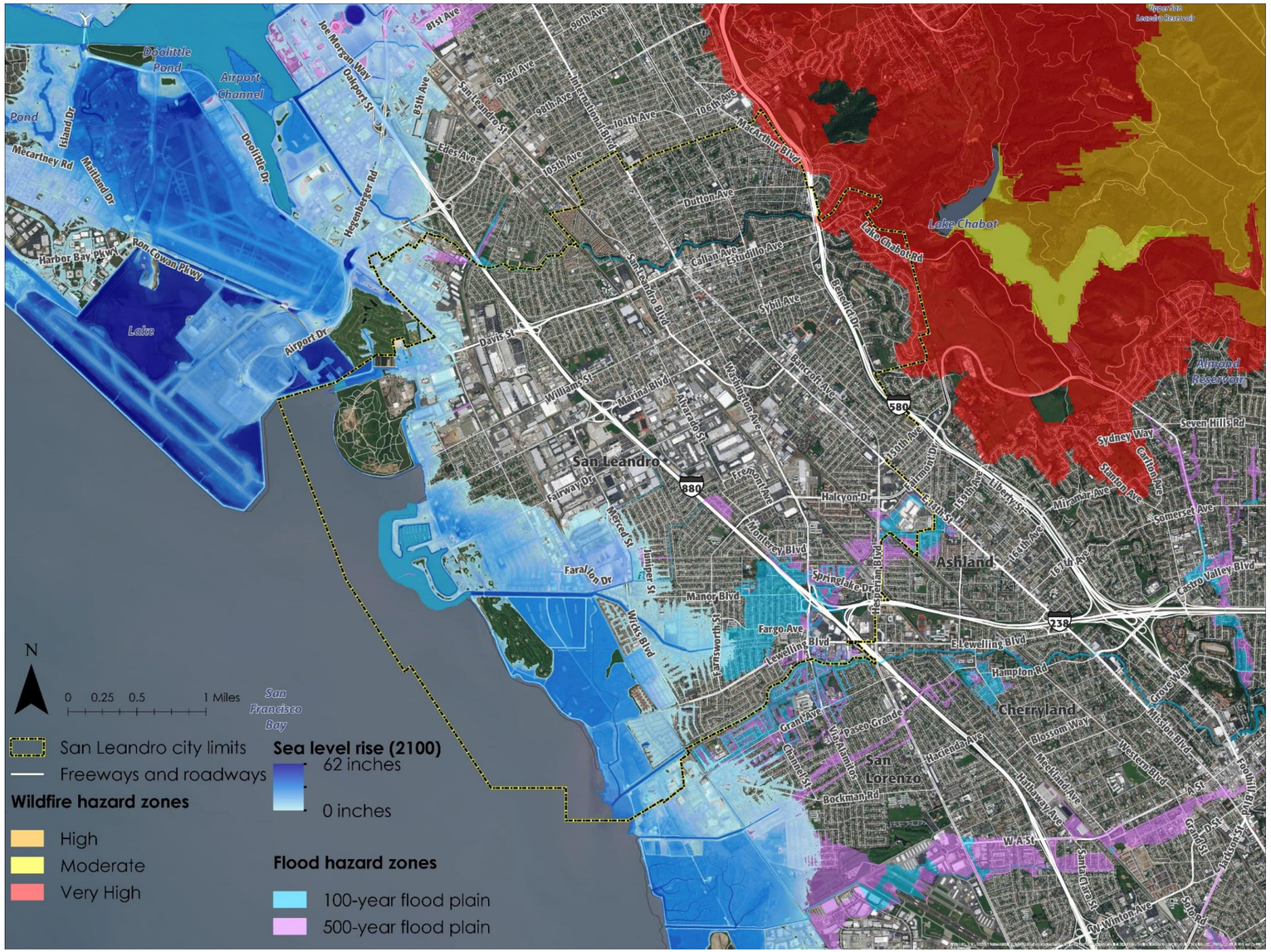
Low-lying coastal areas, such as the Oyster Bay Regional Shoreline, San Leandro Shoreline, and Mission Bay are most susceptible to the effects of bayshore flooding.

Households within the Mulford Gardens, Marina Faire, and Heron Bay neighborhoods will be affected by bayshore flooding. [28, 29] Low-income households may live in structures that are not water-proofed or built above the current 100-year flood elevation. Bayshore flooding can damage homes, cause mildew and mold to grow, and destroy infrastructure. The Mission Bay and Sandev mobile home parks are within the 2050 bayshore flooding area.[30] Mobile homes are generally less resilient than conventionally-built structures and more susceptible to damage.

Additionally, many industrial centers are within the bayshore flooding area.[31] Flooding can interrupt economic activity and damage buildings or cause the release of harmful chemicals used in industrial processes.

Multiple freight lines are within the bayshore flood areas in San Leandro. Coastal flooding can damage track bed and ballast material, and the entire local rail system could shut down, interrupting both freight and passenger rail services. Rail lines can be hardened and protected through both natural and fabricated coastal protection infrastructure. However, these options are expensive and may not always be feasible. Rail systems are also owned by different entities, so consistent adaptation strategies may be difficult to implement and fund.[32]

Figure 9 Hazard Areas in San Leandro



Map created by PlaceWorks with data from CAL FIRE, the Federal Emergency Management Agency (FEMA), and Bay Conservation and Development Commission (BCDC)/Adapting to Rising Tides. Note that this map does not take any planned projects into account (e.g., Neptune Levy or Shoreline development projects).

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Water and wastewater services can be disrupted by bayshore flooding if wastewater treatment plants' functionality is disrupted. The San Leandro Water Treatment Plant is within the 2050 bayshore flooding area. Bayshore flooding can exacerbate wet weather flows into the treatment plant and prevent the plant from functioning properly [33]. Pumps and control panels that are not water-proofed or salt resistant could fail. Failure of treatment plants pumps could cause sewer systems to back up and potentially contaminate streams and water systems with raw sewage.

Neptune, Bermuda, Catalina, and potentially other sewer lift stations are susceptible to bayshore flooding. Failure of these systems would cause direct discharge of raw sewage to the Bay. At four feet in elevation, the Wicks storm pump station is susceptible to flooding from the Bay. Storm pump stations can be hardened and protected from bayshore flooding. They can also be lifted above the flood levels. However, if inundation is consistent, pump station functionality may decline.

Bayshore flooding is expected to inundate the wetland habitat in the Mission Bay area by 2050. The wildlife habitat, recreation, and flood protection that these ecosystems provide may not be able to be sustained. [34]

Case Study: Neptune Drive Shoreline Flood Protection

The City of San Leandro has proposed forming an assessment district to fund the construction of a levee at 13145-13164 Neptune Drive near the intersection of Neptune Drive and Marina Boulevard. The levee would be one of two levees designed to provide flood protection and reduce the number of properties that fall within the flood zone.

Several hundred properties fall within the FEMA-designated "High Risk" Flood Zone, including several that were added in 2016. When both levees are completed, the FEMA Flood Zone designation will change from "High Risk" to "Moderate to Low Risk," helping to protect community members from flooding and SLR and potentially reducing flood insurance premiums.

The site of the proposed levee, circled in yellow.

Drought

A drought occurs when conditions are drier than normal for an extended period, making less water available for people and ecosystems. Droughts are a regular occurrence in California; however, scientists expect that climate change will lead to more frequent and more intense droughts statewide. Overall, precipitation levels are expected to remain similar, with more years of extreme precipitation events. East Bay Municipal Utility District (EBMUD) obtains fresh water supplies for San Leandro and other East Bay communities from the Mokelumne River watershed in the Sierra Nevada.

Drought conditions can cause smaller streams to run dry, which can subsequently harm the plants and animal habitats within the ecosystem. In an early-century drought (2023 to 2042), the City could experience a drop in average precipitation from an average of 19.0 inches per year to an average of 16.7 inches per year, which would lower baseflows in streams from an average of 4.9 inches per day to 3.7 inches per day.[35] In a late-century drought (2051 to 2070), precipitation could also drop to an average of 16.7 inches per year and cause baseflows in streams to drop to 3.6 inches per day.[36] Drought conditions could lower water quality and raise water temperatures, reducing dissolved oxygen levels and promoting algae growth that can harm a variety of fish species.[37] Wetlands and riparian habitats could experience increased soil erosion, degradation of landscape quality, and loss of biological productivity. Since wetlands act as a buffer between developed areas and San Francisco Bay, helping to protect the community from SLR and bayshore flooding, degradation of wetlands could reduce the amount of water that the ecosystem can absorb and limit the protection that the wetlands provide. Drought conditions can also dry out vegetation, increasing its vulnerability to pests and disease and promoting wildfire conditions.

Extreme Heat

Extreme heat occurs when temperatures rise significantly above normal levels. In San Leandro, an extreme heat day occurs when temperatures reach above 88.8 degrees Fahrenheit (°F). As shown in **Figure 10**, the number of extreme heat days in San Leandro is projected to increase from 4 days historically, to an average of 12 extreme heat days per year by midcentury and an average of up to 22 extreme heat days per year by the end of the century.

Extreme heat can also occur in the form of warmer nights when temperatures do not drop overnight and provide relief from the heat. In San Leandro, a warm night occurs when the temperature remains above 60.9°F.[2] As shown in **Figure 110**, the number of warm nights in San Leandro is projected to increase from an average of 4 historically, to an average of 50

[2] According to Cal-Adapt, a warm night occurs when daily minimum temperature is higher than 98 percent of the observed daily minimum temperatures between April and October from 1961 to 1990.

warm nights per year by midcentury, and an average of up to 120 warm nights per year by the end of the century.

Figure 10 Projected Extreme Heat Days in San Leandro[38]

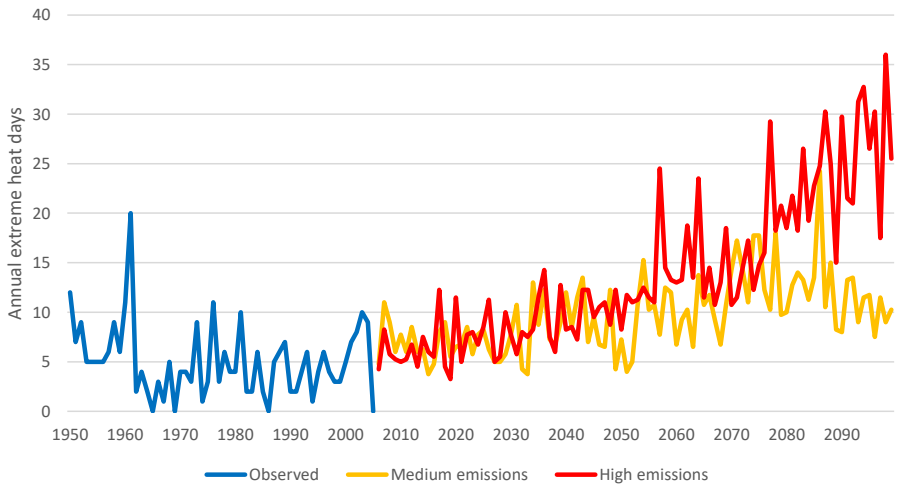
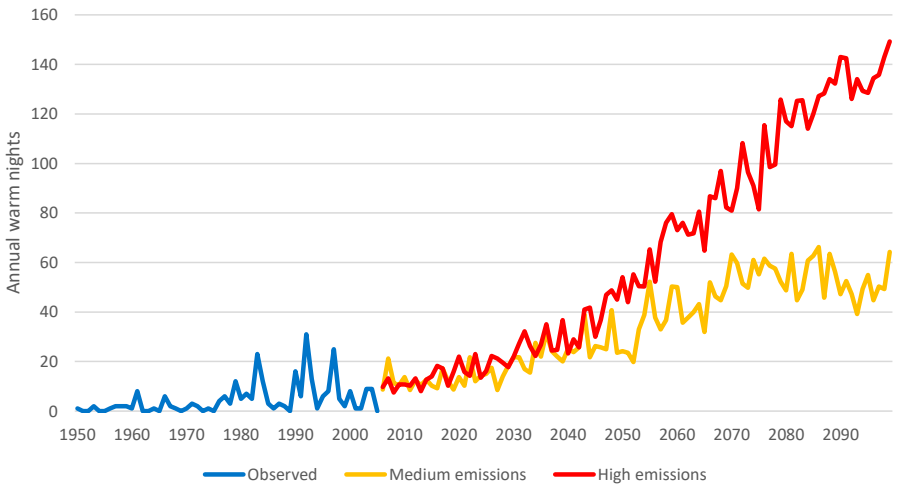


Figure 11 Projected Warm Nights in San Leandro[39]



Extreme heat can interrupt sleep and daily activities, exacerbate respiratory and cardiovascular conditions, and cause a variety of severe health impacts and illnesses, including heat cramps, heat exhaustion, heat stroke, and death. The most vulnerable populations are those that spend a disproportionately high amount of time outside, such as children, outdoor workers, and persons experiencing homelessness; those who cannot easily adjust to their environments in order to reduce heat exposure, such as households in poverty; and those whose health makes them particularly sensitive to heat, including those with sensitive or compromised immune systems, persons with chronic illnesses, and seniors.

On average, children spend more time than adults outdoors, which leaves them more susceptible to negative health outcomes from extreme heat. [40] Child athletes (due to high levels of exertion and increased time spent outdoors) and children under the age of four are considered to be at especially high risk. [41]

Outdoor workers are directly exposed to extreme heat due to the nature of their work. Outdoor work is often physically intensive, and workers face higher risks of heat exhaustion, sunstroke, and other heat-related medical conditions. Outdoor work may be suspended during heat events; however, this can cause significant financial hardships.

Persons experiencing homelessness face greater exposure to extreme heat because they lack access to permanent and often temporary shelter. Dehydration is common among these persons, which makes health-related complications from extreme heat more likely.

Persons experiencing homelessness are more likely to suffer respiratory infections, which are exacerbated by extreme heat. Persons experiencing homelessness and who are on medication are also at greater risk from extreme heat because some medications interfere with the body's ability to maintain a safe internal temperature during times of extreme temperatures.

Households in poverty are less likely to live in air-conditioned buildings or those that have effective insulation, increasing their exposure to extreme heat. During extreme heat days, uninsulated or poorly-insulated homes may reach unhealthy temperatures. Households in poverty may not have access to medical services, which means that they are more likely to have medical conditions that can be exacerbated by extreme heat.

Aging can impair muscle strength, coordination, cognitive ability, the immune system, and the ability to regulate body temperature, making elderly populations, especially those with limited income or mobility, at a higher risk of health impacts from extreme heat events. [42] Medications that seniors may be taking can also limit their ability to maintain a safe internal temperature. In general, seniors are more likely to suffer medical complications or death during extreme heat events than other members of the population.

Extreme heat can regularly cause power outages due to a combination of mechanical failure of electrical grid equipment, heat damage to the wires themselves, and high demand for electricity as a result of cooling equipment, all of which causes stress on the grid. As extreme heat events become more frequent and intense, disruptions in service are likely to become more frequent. Although high temperatures in the City may not damage energy services, transmission lines going through inland areas can be damaged or not function properly due to extreme heat.

Additional vulnerabilities include outdoor recreation, as people may be deterred from recreating outdoors in high temperatures, and aquatic and wetland habitats, whose water quality may decline as temperatures increase.

Flooding

As explained by the California Fourth Climate Change Assessment, California's water system is structured and operated to balance between water storage for dry months and flood protection during rainy seasons. Although climate change is likely to lead to a drier climate overall, risks from higher frequency, more intense rainfall events can generate more frequent and/or more severe flooding that upsets this managed balance between storage and protection.

Climate change forecasts for the San Leandro region predict more intense rainfall events, more frequent or extensive runoff, and more flooding. According to Cal-Adapt, historically, intense rain events occurred an average of 2 times per year; they are projected to

increase to an average of 3.5 events per year by midcentury and an average of 4.25 events by the end of the century.

Inland flooding can cause significant harm to buildings, people, and infrastructure. Floodwater can be deep enough to drown people and may move fast enough to carry away people or heavy objects (such as cars). Flooding can be caused by heavy rainfall, long periods of moderate rainfall, or clogged storm drains during periods of rainfall. In rare instances, a break in a water pipe or water tank can also cause flooding. Storm drainage systems throughout the City collect stormwater runoff and convey water to prevent localized flooding. However, these systems are typically designed based on winter storms recorded in the past and may not be designed to accommodate more intense storms.

As seen ~~above~~ previously in **Figure 9**, areas in San Leandro within the 100-year flood zone include land adjacent to San Leandro Creek, San Lorenzo Creek, and the Estudillo Canal; land along flood control channels in the vicinity of Bayfair Center and Bonaire Park; and coastal areas surrounding Oyster Bay Regional Shoreline, the San Leandro Shoreline, and Mission Bay.

Several populations and assets face particularly high risks from flooding events. Persons experiencing homelessness, households in poverty, and linguistically isolated persons are severely vulnerable to flooding, as they may live in or near flood hazard areas, lack financial resources to protect their homes, or have difficulty receiving adequate evacuation notices due to language barriers. Persons with limited mobility and those without access to lifelines (persons without access to a car, transit, or communication systems) may have difficulty evacuating prior to a flooding event, and therefore are also highly vulnerable.

An additional consequence of a property's designation within the 100-year flood zone is that flood insurance is required for federally-insured mortgage loans and may be required by other mortgage lenders. Additionally, the City's Flood Plain Management Ordinance requires that new construction, additions, and major home improvement projects be raised at least one foot above the base flood elevation. This can be a significant expense for homeowners making alterations to existing structures.

Transportation infrastructure, such as electric vehicle charging stations, evacuation routes, and major roads and highways, which are essential for public transit access, solid waste removal, and other services, can be inundated, blocked, and damaged by floodwaters.

San Leandro's wastewater treatment plant is within the flood hazard area. Floodwaters can increase wet weather flow into the plant and cause permanent damage to the system and/or reduce its functionality. In cases of severe damage, the system can back up and flood neighborhoods with sewage. Most sewage lift stations are in low-lying areas

susceptible to flooding. Major points in the water delivery system, such as the Mokelumne Aqueduct, could also be disrupted, which would prevent water from flowing into the EBMUD.

Human Health Hazards

Human health hazards are bacteria, viruses, parasites, and other organisms that can cause diseases and illness in people. Some of these diseases may only cause mild inconvenience, but others are potentially life threatening. These diseases can be and often are carried by animals such as mice and rats, ticks, and mosquitos. Warmer temperatures and high levels of precipitation can lead to increased populations of disease-carrying animals, creating a greater risk of disease and increased rates of infection. Other human health hazards include poor air quality, such as ozone pollution and smoke from wildfires, which can affect respiratory systems of those exposed for prolonged periods.

Populations most vulnerable to human health hazards are those who spend a disproportionate amount of time outdoors (such as outdoor workers or persons experiencing homelessness), those with fragile immune systems or existing illnesses (which may include persons with chronic illnesses and seniors), and those who may live in substandard housing or not have access to health insurance and medical care (households in poverty, low-income households, undocumented persons). These persons may be living in conditions that increase their chances of catching vector-borne illnesses or they may lack the ability to fight off infections. Many populations may not have access to air purification systems that can filter out harmful particulate matter.[43]

Emergency medical response services are also highly vulnerable to human health hazards, as they may not be able to provide adequate services if there is an influx of health-related emergencies.

Landslide and Debris Flow

Landslides occur when a hillside becomes unstable, causing soil and rocks to slide downslope. Landslides can include rock falls, deep failures of slopes, and shallow debris flows. Landslides are most common on steep slopes and hillsides made of loose soil or other material, where excavation and grading, drainage alterations, or changes in vegetation have occurred. The vulnerability assessment looks at landslides that are caused by precipitation, although earthquakes can also trigger landslides. Hillsides commonly absorb water, which increases instability of the slope and may increase the risk of slope failure. Steep slopes made up of loose or fractured material are more likely to slide. In some cases, hillsides can become so saturated that slope failures result in a mudslide (a mixture of soil and water moving downslope). Steeper slopes in the San Leandro Hills are in high landslide susceptibility areas.

Landslides and mudslides can move fast enough to damage or destroy homes or other structures in their path, block roadways (including evacuation routes), and injure or kill people caught in them. The most vulnerable populations are those that may be unable to evacuate due to limited mobility, lack of access to a vehicle, or language barriers that may prevent awareness of emergency notifications. Those living on single-access roadways in the hilly portion of the City or those living in less resilient housing may lose access to their homes if roadways or the structures are damaged or destroyed by a landslide. Infrastructure, such as natural gas pipelines and water or wastewater infrastructure, can break or malfunction if the soil supporting them fails. This can lead to disruptions in energy delivery and water or wastewater services.

Sea-Level Rise

As global temperatures rise, glaciers and other land ice near the north and south poles melt. The water flows into the ocean, increasing sea levels across the globe. Higher temperatures also cause water to expand in oceans, causing further rising of sea levels. SLR is a gradual process, taking place over years or decades. In California, guidance suggests that sea levels will increase by 6 to 10 inches in most places by 2030, 13 to 23 inches by 2050, and 41 to 83 inches by 2100.[44] However, it is possible that sea levels could rise faster than these projections.[45] Along San Leandro's bay shoreline, sea levels are projected to rise approximately 24 inches by 2050 and as much as 84 inches by 2100.[46]

Rising sea levels can increase the frequency and severity of bay shoreline flooding. Since SLR raises ocean levels, shoreline floods, such as king tides and storm surges, can reach further onto land. For example, a storm that has a 1 in 10 chance of occurring in a given year (known as a 10-year storm), can create a temporary increase in sea levels of approximately 28 to 30 inches. This means that if sea levels rise by 24 inches during normal conditions, a 10-year storm event would create a temporary SLR of around 52 inches.[47] Bayshore flooding zones in 2050 and 2100 are shown ~~above~~ in **Figure 9**. Higher sea levels can also give a "boost" to smaller floods that would not have been large enough to flood dry land during normal conditions, making shoreline flooding more frequent.

Eventually, sea level may increase enough to permanently flood low-lying areas in the eastern portion of San Leandro along the bayshore. Homes within the Mulford Gardens, Marina Faire, and Heron Bay neighborhoods are within the SLR inundation area. [48] SLR can increase residential flooding in these neighborhoods, causing mold and mildew to grow. Eventually, homes in these neighborhoods may become uninhabitable. Homes and structures built above sea level can still be harmed if the higher levels of water erode the rock or soil supporting the structures, potentially making them unsafe or at risk of collapse.

Many industrial centers are within the bayshore flooding area. [49] SLR can inundate the foundations of buildings or cause more frequent flooding, causing the release of harmful chemicals used in industrial processes.

Water and wastewater services can be disrupted from SLR. The Water Pollution Control Plant (WPCP) is within the 2050 SLR area. Pumps and control panels that are not waterproofed or salt-resistant could fail or be damaged by SLR. Failure of these treatment plant components could cause the sewer systems to back up and potentially contaminate streams and potable water systems with raw sewage. Saltwater inundation can exacerbate wet weather flows caused by stormwater and bayshore flooding, preventing the system from functioning properly. [50]

Wetlands included in the herbaceous ecosystem will be inundated by rising sea levels. The wildlife habitat, passive recreation, and flood protection that these ecosystems provide may not be able to be sustained. [51]

Persons experiencing homelessness, persons without access to lifelines, or persons with limited income or access to resources may be more likely to live in low-lying areas or less-resilient structures, and therefore are highly vulnerable to SLR and associated bayshore flooding.

Severe Storms

Severe storms include windstorms, hail, lightning, thunderstorms, and heavy rainfall. Severe weather is usually caused by intense storm systems, although some types of strong winds can occur without a storm. The connection between climate change and severe storms is not as well established as other exposures, but new evidence suggests that severe storms may occur more often and become more intense than in the past.[52] Severe winds—over 50 to 60 miles per hour but up to 100 miles per hour—can damage or destroy buildings and infrastructure. Hail can damage buildings and plants (and in extreme cases injure people), and lightning can spark fires, injure people, or cause fatalities. Heavy rainfall, which is characterized by rainfall amounts that exceed normal levels, can lead to flooding throughout San Leandro. Strong winds and heavy rainfall are the most common types of severe weather in the City.

The most vulnerable to severe weather are persons experiencing homelessness; those who may live in less structurally resilient buildings, such as households in poverty and undocumented persons; and those who may have difficulty preparing for or responding to severe weather due to mobility or language barriers. These populations include linguistically isolated populations, persons living on single-access roads, persons with chronic illnesses and/or physical disabilities, and seniors living alone.

The energy delivery system is especially vulnerable to windstorms, which can damage transmission lines or cause Public Safety Power Shutoff (PSPS) events. Windstorms can also damage warehouses that hold harmful materials and prevent people from traveling to work, which can affect important economic drivers in the City.

Increased Rate of Wildfires

Wildfires are a regular feature of the landscape in much of California. They can be sparked by lightning, malfunctioning equipment, vehicle crashes, or many other causes. Warmer temperatures, an increase in drought conditions, and extreme wind events are likely to create more fuel for fires in natural and rural areas, leading to a greater chance that a spark will grow into a potentially dangerous blaze. Climate change is also expected to extend the fire season throughout much (or even all) of the year.

The City of San Leandro is adjacent to thousands of acres of potentially flammable coastal scrub and forested space. **Figure 9** shows the fire hazard severity zones in San Leandro, which include very high fire hazard severity zones along the eastern edges of the Bay-O-Vista neighborhood and the Daniels Drive area. Because wildfires burn the trees and other vegetation that help stabilize a hillside and absorb water, more areas burned by fire may also lead to an increase in landslides and debris flows. According to Cal-Adapt, the annual average area burned by wildfire in the region is projected to experience a modest increase. Historically, the annual average area burned in Alameda County was approximately 4,020 acres. According to Cal-Adapt, under the higher emissions scenario, this could increase to an average annual burn area of approximately 4,600 acres. Although most of this increased wildfire activity is unlikely to occur in San Leandro itself, San Leandro residents will still be impacted by smoke from wildfires in other parts of the county or the state.

Wildfires expose people and property to flames, increasing the risk of injury, death, and property damage or destruction.

The smoke from wildfires increases air pollution levels and creates a significant health risk in the region, particularly under weather conditions that prevent smoke from clearing, such as those during the Lightning Complex fires in 2020. Most of the populations within San Leandro are highly or severely vulnerable to wildfire and heavy smoke scenarios, which can aggravate asthma and respiratory conditions as well as cause long-term health issues. Planned PSPS events to prevent wildfires have already impacted persons who depend on electricity for air conditioning, medically necessary equipment, or mobility, as well as destabilized low-income households unable to change routines.

Essential roadways, such as evacuation routes and single-access roads, can be blocked by wildfire flames or debris, making it difficult for residents to evacuate and emergency

personnel to reach certain areas of the City. I-580, which is located within the wildland urban interface, is especially vulnerable to wildfire.

Some of the electrical transmission lines that run through San Leandro are within very high fire severity zones. [53] Electrical transmission lines and the poles that support them can be damaged or destroyed by the flames and high temperatures created by wildfires. These transmission lines may also be shut off during wildfire weather conditions, creating hardships for residents and businesses within the city.

Coastal scrub and oak woodlands, although somewhat adapted to wildfires, can be substantially harmed by more frequent and severe fires that do not let the ecosystems recover.

This chapter highlights the effects that failure to effectively reduce GHG emissions may have on the San Leandro community. Chapter 4 describes the efforts the City plans to mitigate these effects by reducing community-wide GHG emissions.

4. GHG Reduction Strategies

EXISTING AND PLANNED REDUCTION STRATEGIES

In order to evaluate the City's current progress toward meeting its emissions reductions targets, this CAP acknowledges the City's existing climate policies and programs, planned future actions, and actions already and soon-to-be implemented at the State level. These policies and programs are summarized in the "State Existing and Planned Accomplishments" and "Local and Regional Existing and Planned Accomplishments" sections, below.

Once the emissions reduction benefits of existing actions have been identified, the CAP identifies future policies that, if implemented, will help the City achieve its emissions reductions targets.

State Existing and Planned Accomplishments

Since passing AB 32, the State has enacted regulations and programs to reduce GHG emissions. Although statewide in scope, these actions affect several sources of San Leandro's emissions, and so the local benefits of these State efforts can be "credited" to San Leandro even in cases where the community has not needed to take any action. This CAP includes the local benefits from five State policies:

- **Renewable Portfolio Standard:** The Renewables Portfolio Standard (RPS) was first established in 2002 and has been amended multiple times, most recently by SB 100 in 2018. It requires all electricity providers in the state to obtain at least 33 percent of their electricity from eligible renewable resources by the end of 2030, and all of their electricity from carbon-free (although not necessarily eligible renewable) resources by the end of 2045. This policy reduces GHG emission from electricity use, including electricity used to transport and process water and wastewater, and electricity used for electric vehicles.
- **Clean Car Standards:** In 2002, California adopted AB 1493, the New Passenger Motor Vehicle Greenhouse Gas Emission Standards or Pavley standard. It required a reduction in tailpipe GHG emissions from new vehicles produced from 2009 to 2015. In 2012 CARB adopted an extension of this policy, the Advanced Clean Car Standards, which requires more stringent reductions in tailpipe GHG emissions from vehicles produced from 2016 to 2025. The Clean Car Standards (including the Advanced Clean Car Standards) reduce GHG emissions from on-road transportation.
- **Title 24 Energy Efficiency Standards:** California Code of Regulations, Title 24, Part 6 is California's energy efficiency standards for new and renovated buildings, applied at the local level through the project review/building permit process. The standards are

strengthened every three years, with the ultimate goal of making new buildings net-zero energy, meaning that they would generate as much energy as they use. The most recent set of Title 24 standards went into effect on January 1, 2020. This policy will reduce GHG emissions from electricity and natural gas use in new homes and non-residential buildings.

- **Local Carbon Fuel Standard:** The Low Carbon Fuel Standard was adopted in 2009 and required a 10 percent reduction in the carbon intensity of all transportation and equipment fuels by 2020. This policy reduces GHG emissions from on-road transportation and from off-road equipment.
- **Innovative Clean Transit:** California's Innovative Clean Transit regulation, also known as the Zero-Emission Bus standard, was adopted in 2018. It requires California's public transit agencies to use all zero-emission buses, such as battery electric and hydrogen fuel cell models, by 2040. This regulation will reduce emissions from on-road transportation activities.

Collectively, the State reduction efforts are expected to reduce San Leandro's GHG emissions by 16,910 $MTCO_2e$ below forecast levels by 2020; 122,580 $MTCO_2e$ by 2030; and 218,490 $MTCO_2e$ by 2050. **Table ~~6~~ 7** shows the emissions reductions from individual State activities.

There are other programs that reduce GHG emissions that State agencies have adopted or are planning to put into effect These are not included in this section because of uncertainty about how these programs will be applied. In many cases, State programs may be implemented by local actions, and reductions associated with these programs are included in the local reduction strategies discussed later in this chapter.

Table ~~67~~ 7 San Leandro Community GHG Emission Reductions from State Programs

Policy	2020 Emissions ($MTCO_2e$)	2030 Emissions ($MTCO_2e$)	2050 Emissions ($MTCO_2e$)
Forecast Emissions	630,160	659,100	692,850
Clean Car Standards *	13,620	101,490	150,470
Renewable Portfolio Standards (RPS)	0	15,720	61,240
Title 24	420	1,680	1,390
Local Carbon Fuel Standard †	2,870	2,580	2,260
Innovative Clean Transit	0	1,110	3,130
Total reductions from existing State Programs	**16,910**	**122,580**	**218,490**
Emissions with existing State programs	613,250	536,520	474,360

* Includes reductions from the Low Carbon Fuel Standard for transportation fuels

† Reductions from off-road equipment fuel only

Due to rounding, the total value may not equal the sum of individual rows.

Local and Regional Existing and Planned Accomplishments

The City of San Leandro, in coordination with regional partners, has a successful history of developing and implementing sustainability policies. The City's adopted plans, along with leadership from community members and businesses, have been partially responsible for the decline in GHG emissions since 2009. Several policies are currently in place that are expected to further reduce San Leandro's GHG emissions.

As part of the CAP update process, the project team identified the following existing local and regional efforts that are expected to reduce San Leandro's future GHG emissions:

Local landscaping.

- **East Bay Community Energy.** Launched in 2018, East Bay Community Energy is the default electricity supplier for San Leandro and provides an increased supply of electricity from renewable sources.
- **Energy Efficiency Retrofits.** The City has made municipal energy efficiency retrofits under its 2014 Climatec contract and installed a 1 mega-watt solar photovoltaic array with assistance from a 2017 California Energy Commission grant, saving approximately 3,810,000 kilowatt-hours in energy per year.
- **Streetlight Retrofits.** The City began replacing high-pressure sodium streetlight bulbs with LEDs in 2010 (Phase 1), with a second phase concluding in 2017. Approximately 4,600 bulbs have been replaced.
- **Renewable Energy Capacity.** Across the City, renewable energy capacity has been enhanced via the installation of residential and commercial solar panels.
- **Municipal Renewable Diesel.** The City fleet encompasses necessary vehicles ranging from police cars to maintenance trucks to forklifts that all serve important jobs to keep the community safe, clean, and attractive. In 2018, the City switched all diesel municipal vehicles to 100-percent renewable diesel.
- **Shuttles.** Since its inception in 2001, the LINKS shuttle has served businesses in West San Leandro by providing a free transportation service for places of employment and the Downtown San Leandro BART Station. As of 2018, the LINKs shuttle serviced approximately 198,000 riders per year.
- **Clean BART Electricity.** Beginning in 2017, BART has significantly increased the amount of renewable and low- and no-carbon

Shuttle service within San Leandro.

electricity it purchases to run its trains and facilities, causing a substantial reduction in BART-related GHG emissions.

Landscaping in San Leandro.

The City has implemented additional sustainability efforts whose GHG emissions reductions cannot be quantified due to lack of available data or uncertainties around how these policies are put into effect. However, these efforts do support continued GHG emissions reduction and other community and environmental goals.

In January 2003, the City adopted a Construction and Demolition Debris Recycling Ordinance to ensure that job site debris is recycled. In October 2004, the City adopted a comprehensive Environmentally Preferable Purchasing Policy to encourage all staff to consider environmental aspects when procuring products and services for the City.

Since 2006, the City has been formally promoting national and regional green building guidelines for development. City staff have been active participants of the California Building Officials Green Building Committee, which seeks to provide useful information to building officials and others to promote the understanding and proper application of green building technologies. In May 2008, the City Council adopted an ordinance requiring a minimum certification rating by the US Green Building Council in their Leadership in Energy and Environmental Design (LEED) rating system. The ordinance sets a level of LEED Silver for all municipal buildings and renovation projects that equal or exceed $3 million in construction costs.

Since January 2009, San Leandro's Building & Safety Division has required contractors and builders to complete a Green Building checklist for any building permits that include:

- New residential or nonresidential construction
- Residential additions or alterations that increase the building size
- Non-residential additions of 1,000 square feet or more, or projects over $200,000 in value

The goal of this initiative is to teach local builders about green building and the related certification programs, and potentially achieve long-term market transformation of increased awareness and understanding of green building practices. This checklist is updated regularly with revisions to Building Codes.

In June 2009, the City adopted a Bay-Friendly Landscaping Ordinance, requiring that all landscaping in municipal and public/private partnership projects (new and refurbished) at

or over $100,000 in value and 2,500 square feet in area achieve the minimum Bay-Friendly Landscape score as recommended by StopWaste. Bay-Friendly Landscaping is a holistic approach to gardening and landscaping that works in harmony with the natural conditions of the San Francisco Bay Watershed. Bay-Friendly's practices foster soil health, conserve water and other valuable resources, reduce waste, and prevent pollution.

A Water-Efficient Landscaping Ordinance (WELO) was adopted December 2009 requiring increased water efficiency of new landscapes greater than 500 square feet or remodeled landscapes greater than 2,500 square feet. It requires "smart" irrigation timers, the use of native and/or drought-tolerant vegetation, limitations on watering during certain hours, and restrictions on the amount of turf allowed, among other regulations. The WELO has been revised since its initial adoption to account for new innovations and increased understanding of future drought conditions.

In 2009, the City retrofitted some of its fleet vehicles with diesel particulate filters to comply with the California Air Resources Board's Particulate Matter Retrofit Program.

In 2014, the City entered into partnership with Climatec with the goal of saving energy and water through a set of infrastructure retrofits and smart city projects. These projects have included an LED upgrade to the City's streetlights, installation of high-efficiency HVAC equipment, and installation of smart irrigation clocks at City parks. As of 2021, these projects have resulted in a reduction of approximately 60 metric tons of GHG emissions.

The 2035 San Leandro General Plan, updated in 2016, includes wide-ranging policies and actions that guide long-range development decisions in the City to promote environmental sustainability for current and future generations. In particular, the Land Use and Transportation Elements of the Plan outline numerous goals, policies, and actions that will reduce emissions from the transportation sector and encourage walking, bicycling, and public transportation. Policies in the General Plan strive to maintain a quality environment that is environmentally, fiscally, and economically sustainable.

In 2017, the California Energy Commission (CEC) awarded the City of San Leandro $1.99 million in grant funding via its Energy Innovation Challenge for Local Governments. These funds enabled the City to develop plans to upgrade the WPCP, which is expected to cut the WPCP's electric power usage in half. With the City's first solar array installed at the WPCP and operational in 2020, the City is currently moving forward with designs for a microgrid plan for battery storage there.

The City has worked to facilitate electric vehicle parking and charging by amending the municipal code (in 2017) to include guidelines for electric vehicle charging station permits. This is intended to expedite and streamline the permitting process for electric vehicle charging stations on private property.

In 2018, the City adopted the Bay Fair Transit-Oriented Development (TOD) Specific Plan to set a vision for the approximately 150-acre area surrounding the Bay Fair BART station as a mixed-use, TOD. One of the Specific Plan's desired outcomes is a sustainable urban environment that incorporates green building features, green infrastructure and ecology, sustainable energy systems, water efficiency and conservation, and sustainable transportation systems.

In March 2020, San Leandro announced its commitment to become a SolSmart-designated community and became a Bronze-certified SolSmart community in November 2020. This means that, in partnership with the SolSmart team, the City will work to improve solar market conditions, making it easier for residents and businesses to install solar systems. The City aims to launch a marketing campaign for solar financing, tax, and rebate opportunities to San Leandro residents, and to increase renewable energy usage in City facilities.

In 2020, the City was recognized by the Beacon Award Program for addressing climate change and energy efficiency in the following areas:

- Platinum Level Award for 20 percent Community Greenhouse Gas Reductions
- Gold Level Award for 10 percent Agency Greenhouse Gas Reductions
- Platinum Level Award for 32 percent Agency Energy Savings
- Gold Level Award for Sustainability Best Practices

Collectively, San Leandro's existing and planned local and regional accomplishments are expected to reduce emissions by 46,080 MTC_2e by 2020, 38,770 $MTCO_2e$ by 2030, and 4,570 $MTCO_2e$ by 2050 in addition to the reductions achieved by State accomplishments. **Table ~~7~~ 8** shows the reductions from each local and regional accomplishment.

Table ~~7~~8 San Leandro Community GHG Emission Reductions from Local and Regional Programs

Policy	2020 Emissions ($MTCO_2e$)	2030 Emissions ($MTCO_2e$)	2050 Emissions ($MTCO_2e$)
Emissions with Existing State Programs	613,250	536,520	474,360
Easy Bay Community State Programs	-42,480	35,040	0
Municipal Energy Efficiency Retrofits	-60	30	0
Streetlight Retrofits	-20	10	0
Renewable Energy Capacity	-50	20	0
Municipal Renewable Diesel	-10	10	10
Shuttles	-10	10	10
Total emissions reductions from local and regional programs	**46,080**	**38,770**	**4,570**
Emissions with existing and planned local and regional programs	567,170	497,750	469,790

Due to rounding, the total value may not equal the sum of individual rows.

Existing and planned local, regional, and State accomplishments reduce San Leandro's forecast GHG emissions by a significant amount. **Table ~~8~~ 9** shows the benefit of these accomplishments relative to San Leandro's emissions baseline.

Table ~~8~~9 Emissions with Existing and Planned Efforts

	2020	2030	2050
Baseline Emissions ($MTCO_2e$)	720,990	720,990	720,990
Emissions with existing and planned programs ($MTCO_2e$)	567,170	497,750	469,790
Percent below baseline emissions	-21%	-31%	-35%

NEW REDUCTION STRATEGIES

A central goal of the 2021 CAP update is to achieve additional GHG reductions to work toward the City's 2030 and 2050 reduction targets, recognizing that the reduction strategies in the 2009 CAP are insufficient to meet these reductions. To identify these additional reductions, the project team began with the GHG reduction strategies in the City's 2009 CAP. Some of these strategies have been fully implemented and do not need to be carried forward into the 2021 CAP update. Others are still applicable and can be revised or expanded to achieve additional GHG reductions. There are also opportunities to add entirely new strategies to address new and emerging issues not covered in the 2009 CAP.

The project team based and revised the new GHG reduction strategies on several sources, including:

- San Leandro's inventory and forecast
- The existing and planned State, regional, and local accomplishments
- Discussions with City staff to identify past successes and challenges, plans and opportunities, and goals and priorities related to GHG reduction efforts
- Feedback received through community engagement

Calculating Credit

This CAP uses a process called quantification to determine the amount of GHG emissions reduced by each measure. The foundation for the quantification calculations is the baseline GHG inventory and forecast. Activity data from the inventory, such as vehicle miles traveled or kilowatt-hours, are combined with participation rates and data about the reduction in activity data from each action in order to calculate the GHG reduction benefit of each measure. This approach ensures that the GHG reductions from San Leandro's CAP strategies are tied to current and future activities that are actually occurring in the community.

Calculations for reduction in activity data come from tools and reports provided by government agencies; these agencies include the US Environmental Protection Agency, the CEC, CARB, the California Air Pollution Control Officers Association, the US Department of Energy, and local air districts. If accurate data are not available through these sources, the quantification uses case studies from comparable communities and applicable scholarly research.

The project team was able to identify GHG reductions for most of the strategies in this CAP. However, there are a few that do not have a specific reduction level due to missing data

or the lack of a reliable methodology. These efforts are still expected to reduce GHG emissions, but the level cannot be accurately determined. These strategies are labeled as "supportive."

Renewable Energy Emissions Reductions in 2050

Strategies that only reduce electricity use or increase renewable electricity supplies will show zero GHG reductions in 2050. This is because all electricity sold in California must be carbon-free by 2045, as required by the State's RPS. Since there will already be no emissions from electricity use in 2050, San Leandro cannot count additional reductions associated with electricity in this year. This CAP already credits reductions from the RPS as an existing State program.

Local renewable energy systems and energy efficiency strategies will continue to provide several co-benefits to the community, including lower electricity bills and increased resiliency against power disruptions, even if there are no measurable additional GHG reductions.

GHG Reduction Strategies

Based on the results of this process, the project team identified 52 GHG reduction strategies to include in the 2021 CAP. These strategies include a mix of education and outreach programs to encourage GHG reduction activities, financial subsidies, and other enticements to incentivize GHG reductions, and mandates to require GHG efforts. These 52 strategies are organized into 12 categories:

- Building Electrification (BE)
- Residential Energy Efficiency (RF)
- Commercial Energy Efficiency (CF)
- Municipal Renewable Energy and Energy Efficiency (ME)
- Renewable Energy (RE)
- Reducing Auto Dependency (AD)
- Active and Alternative Transportation (AT)
- Transportation Electrification and Low-Carbon Fuels (TE)
- Waste Management (WM)
- Waste Reduction and Reuse (WR)
- Water Efficiency (WE)
- Community Consumption (CC)
- Equity and Just Transition (EJ)

Each measure entry includes a description of the measure, the anticipated 2030 and 2050 GHG reductions achieved by the measure at the projected performance level, and the recommended actions necessary to implement it. Recommended actions represent the City's current understanding of best practices in achieving GHG emissions reductions and

achieving community equity, availability of technology, and local regulations, as well as the current State and federal regulatory environment. City staff are encouraged to revisit these recommended actions as conditions change and new opportunities become available.

Each measure entry also identifies the co-benefits of the measure, which are advantages provided by the measure beyond GHG reduction. These co-benefits help the City to address broader City Council goals, such as improving environmental health, particularly for the most impacted populations, and building an equitable and just community. Implementing the CAP will result in improved indoor and outdoor air quality, increased resilience, reduced heat and smoke exposure, and decreased air pollution and traffic deaths through lowered automobile dependence.

The 13 co-benefits are:

- Access to transit
- Active mobility
- Cost savings
- Food security
- Green space
- Improved road safety
- Increased civic engagement
- Increased economic vitality
- Local job creation
- Neighborhood resilience
- Reduced air pollution
- Resource conservation
- Walkability

Building Electrification (BE)

Most buildings, both residential and non-residential, use electricity and natural gas to operate appliances and other pieces of equipment. While sources of electricity have become much cleaner over time and will continue to become cleaner due to State law and utility policies, the GHG emissions associated with using a unit of natural gas has remained constant, as natural gas is a fossil fuel and cannot become a cleaner energy source. Buildings that receive most or all their energy from electricity instead of natural gas can significantly reduce their GHG emissions as a result. Buildings can be constructed to be mostly-electric or all-electric, or existing buildings can be electrified as part of retrofit activities. Advances in electric appliances, such as those used for space heating, water heating, and cooking, have helped make building electrification easier and more cost-effective.

BE-1: Electrified retrofits

~~Encourage efforts to~~ Incentivize ~~construct new or~~ significant~~ly~~ building retrofit~~s~~~~ted buildings~~ with fewer or no natural gas appliances to reduce pollution and increase cost savings.

	2030	2050
GHG Reduction ($MTCO_2e$)	8,590	93,610~~67,690~~

Strategy BE-1 actions:

- Partner with EBCE and BayREN to share case studies of all-electric buildings, provide rebates for electric technologies, and help residents and business owners connect with contractors with experience in conducting all-electric retrofits.
- Partner with EBCE and BayREN to provide incentives for residents and businesses wishing to upgrade electric panels to accommodate electric technologies including solar PV, battery storage, air source heat pumps, heat pump water heaters, electric dryers, and electric stoves. Help residents and businesses connect them with experienced contractors.
- Provide training and outreach to residents, businesses, contractors, vendors, and installers about preferable electric equipment replacement technologies.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

BE-2: Electrified new construction

~~Explore feasibility of a~~ Commit to developing a reach code limiting natural gas use in new construction, or as directed by the State or regional agencies.

	2030	2050
GHG Reduction ($MTCO_2e$)	3,150~~1,590~~	5,130~~2,740~~

Strategy BE-2 actions:

- For each three-year energy code cycle, convene a team to ~~investigate the potential for and draft~~develop a reach code to ~~encourage and/or~~ require residential and commercial new construction to ~~be built to an all-electric standard~~limit natural gas use, such asincluding electric heating, cooling, and water heating. This team and its consultants will be responsible for researching recent advances in all-electric building and policy, preparing a cost-benefit analysis, and preparing the code update for review and adoption by the City Council~~.~~.
- ~~Explore the feasibility of i~~incentivize~~ing~~ all-electric buildings instead of buildings that use natural gas.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

Residential Energy Efficiency (RF)

A San Leandro residential neighborhood.

Electricity and natural gas are used to heat, cool, and light homes, as well as to operate appliances and machinery. Conserving the energy used within the home both reduces GHG emissions and reduces residential energy costs. Measures to conserve residential energy use and maximize efficiency include expanding the reach and community-wide awareness of available energy efficiency financing and ensuring that the benefits of energy efficiency are equitably distributed among all community members.

RF-1: Residential energy retrofit financing

Increase education and outreach for existing energy efficiency financing mechanisms, including PACE programs and utility programs. ~~Explore the feasibility of~~Create new financing programs, such as ~~additional financial options, including~~ a revolving loan program.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy RF-1 actions:

- Identify funding sources to incentivize San Leandro homeowners to replace, upgrade, and install systems to meet energy efficiency goals.
- Educate building owners in different languages about the benefits of utility programs and how to participate.
- Host utility program outreach events such as evening workshops and local learn-at-lunch sessions, provide information at community events, and distribute information online and in public buildings.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

RF-2: Residential energy retrofit equity

Prioritize City-funded energy retrofit programs in majority people of color census tracts or high energy cost burdened households.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy RF-2 actions:

- Work with BayREN and other ~~incentive programs~~ funding partners to ~~build out~~develop and implement City-~~fund~~sponsored energy retrofit programs for priority households.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

RF-3: Homeowner energy retrofits

Continue to promote energy efficiency programs and incentives available to residential property owners.

	2030	2050
GHG Reduction ($MTCO_2e$)	6,800	870~~3,710~~

Strategy RF-3 actions:

- Educate homeowners and real estate agents about the benefits of residential energy retrofits, the availability of financing options, and how to participate.
- Provide energy retrofit information to project applicants seeking permits for renovation or expansion work on existing houses.
- Host residential energy outreach events such as evening workshops and local learn-at-lunch sessions, provide energy retrofit information at community events, and distribute information on residential energy retrofits online and in public buildings.
- Promote financing programs that allow homeowners to incrementally pay for energy efficiency retrofits.
- Seek opportunities to provide low- or no-cost energy audits to rental property owners who agree to disclose a unit's energy efficiency results to tenants.
- Support property owners' efforts to participate in energy benchmarking efforts, including via providing information during the permit application process, directing property owners towards appropriate resources, and working with contractors through regional training programs to confirm that they are able to conduct these retrofits.

- Support property owners' efforts installing cool roofs when reroofing buildings, including by providing information about the benefits of cool roofs, training local contractors through regional programs are able to install cool roofs, and providing incentives from the City to property owners who conduct this retrofit.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

RF-4: Rental energy retrofits

Work with landlords and tenants' groups to increase energy efficiency and decrease energy costs in rental homes, including multi-family properties. Mitigate displacement risk by strengthening tenant protections, including relocation assistance and right of return for tenants temporarily displaced by housing retrofits. ~~Consider~~ Utilize methods such as the green lease[3] to address the split incentive issue and prevent tenants paying for property improvements.

	2030	2050
GHG Reduction ($MTCO_2e$)	6,620	10,970~~12,350~~

Strategy RF-4 actions:

- Partner with EBCE and BayREN to educate rental property owners and tenants about the benefits of residential energy efficiency retrofits, the availability of financing options, and how to participate.
- Work with tenant groups and property management companies to identify actions tenants can take within the bounds of their lease to improve energy efficiency.
- Evaluate and identify incentives to encourage rental property owners to make energy efficiency improvements to their units beyond any minimum actions required by the adopted energy code.
- Distribute promotional materials to multi-family developments.
- Evaluate options, including a municipal code update, to require reporting of energy use (ENERGY STAR performance score) by multi-family buildings. If adopted, consider applying benchmarking ordinance to smaller multi-family buildings, below the minimum size threshold for mandatory benchmarking under AB 802.

[3] A green lease is a commercial lease that helps align tenant and landlord interests for investments in energy efficiency. Green leases can take a variety of forms, but may include features such as cost sharing, requirements that tenants follow certain energy-saving best practices, and commitments to obtain green building certifications.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

Commercial Energy Efficiency (CF)

Commercial buildings use electricity and natural gas to light buildings, control temperature, and operate machinery and appliances. Commercial energy efficiency measures ensure that this energy is being used effectively, in turn lowering operational costs, reducing GHG emissions, and enriching the local economy. Incentive programs can put energy efficiency upgrades within reach of local businesses by reducing the upfront costs of these measures. The CAP also aims to support existing programs such as the Green Leases Toolkit and Alameda County Green Building program, which provide additional support to San Leandro's diverse businesses.

CF-1: Nonresidential energy retrofits

Improve energy efficiency in non-residential buildings, including warehousing and manufacturing centers, through programs such as existing incentive programs.

	2030	2050
GHG Reduction ($MTCO_2e$)	7,060	13,340~~620~~

Strategy CF-1 actions:

- Evaluate options, including a municipal code update, to develop a policy requiring reporting of energy use (ENERGY STAR performance score) by commercial buildings. Apply benchmarking ordinance to smaller commercial buildings, below the minimum size threshold for mandatory benchmarking under AB 802 and require commercial buildings to receive an energy assessment every five to ten years depending on size.
- Educate property owners and tenants about energy efficiency retrofit programs and financing options.
- Work with property owners to offer green leases for tenants, allowing tenants to specify energy efficiency improvements to the space or to finance energy efficiency retrofits in exchange for reduced occupancy fees. Promote a green lease addendum template that can be used by non-residential property owners to incorporate green lease language into future leases.
- Advertise and conduct outreach in support of demand response programs.
- Offer low-cost energy audits for business or office parks, including identification of most cost-efficient savings for weatherization or appliance upgrades.

- Offer reduced fee permitting to project applicants undergoing specifically defined energy retrofit measures, such as a retrofit to achieve zero net energy in an existing building.
- Educate property owners about the benefits of installing cool roofs when reroofing buildings, help interested property owners connect with qualified contractors, and provide educational materials for training resources to local contractors.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

CF-2: Leased commercial energy efficiency

Promote the Green Leases Toolkit and other mechanisms to improve energy efficiency in tenant-occupied non-residential buildings.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy CF-2 actions:

- Promote the Green Leases Toolkit to landlords and provide promotional material to be distributed to tenants.
- Reach out to local tenant rights organizations to promote the Green Leases Toolkit.
- Distribute promotional materials to multi-family developments.

Co-Benefits: Cost savings, increased economic vitality, reduced air pollution

CF-3: Green Business program

~~Consider opportunities to E~~expand the effectiveness of and participation in the Alameda County Green Business program.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy CF-3 actions:

- Conduct regular outreach and solicit feedback about the Green Business program from existing participants.
- Celebrate the achievements of the Green Business program and advertise its benefits at City events.
- Include information about the Green Business program as part of the business licensing process.
- Host regular meetings for members of the Green Business program to share information.

Co-Benefits: Local job creation, resource conservation

Municipal Renewable Energy and Energy Efficiency (ME)

The City of San Leandro strives to serve as an example of efficiency and to embody the commitment to reducing emissions citywide. The City plans to continue to seek opportunities to promote clean and efficient energy use, including energy efficiency retrofits, building electrification, public lighting retrofits, and installation of renewable energy projects. Implementation of these strategies will reduce energy use, lower GHG emissions, and lower the City's utility costs. These benefits are passed on to the community as a whole in the form of a more efficient allocation of municipal resources and increased institutional capacity to implement green building best practices citywide.

ME-1: Municipal energy retrofits

~~Explore opportunities for~~Continue implementing ~~additional~~ municipal energy efficiency retrofits, including all-electric buildings and public lighting retrofits.

	2030	2050
GHG Reduction ($MTCO_2e$)	40	130

Strategy ME-1 actions:

- Seek grant funding or low- or no-interest loans to implement energy saving efforts and renewable energy systems at municipal facilities at time of construction or substantial renovation.
- Implement energy efficiency upgrades (including lighting and HVAC systems) at municipal buildings as needed.

Co-Benefits: Cost savings, reduced air pollution

ME-2: Municipal renewable energy

Install additional renewable energy generation and energy storage systems, including solar hot water, at City facilities as appropriate and feasible.

	2030	2050
GHG Reduction ($MTCO_2e$)	20	0

Strategy ME-2 actions:

- Seek grant funding or low- or no-interest loans to implement renewable energy projects at municipal buildings and facilities.
- Partner with East Bay Community Energy (EBCE) to install solar on City facilities.
- Minimize use of fossil fuels for emergency backup power and transition to fully renewable backup power supplies as feasible by 2030.

Co-Benefits: Cost savings, reduced air pollution

ME-3: Municipal energy storage

~~Explore~~ Commit to installation of battery storage systems and microgrids at City facilities for backup energy sources.

	2030	2050
GHG Reduction ($MTCO_2e$)	10	0

Strategy ME-3 actions:

- ~~Identify~~ Partner with EBCE to install ~~appropriate City facilities for~~ battery storage systems and microgrids on City facilities.
- Pursue funding opportunities to install battery storage systems and microgrids.
- Support lobbying efforts to reduce regulatory barriers for microgrids across multiple properties.

Co-Benefits: Neighborhood resilience

Renewable Energy (RE)

A large amount of San Leandro's electricity already comes from renewable or carbon-free sources. However, there are opportunities to increase the proportion of the community's energy mix that comes from renewable sources, which reduces GHG emissions and has the potential to reduce the cost of electricity for residents and enhance the local economy. Increased access to renewable energy resources, coupled with new energy storage systems, can also improve community resilience against power shutoffs and unplanned outages.

Solar panel arrays provide GHG-free electricity. Installing these arrays on local homes and businesses often reduces long-term electricity bills.

RE-1: East Bay Community Energy participation

Encourage San Leandro households and businesses to switch from PG&E electricity supplies to East Bay Community Energy, and ~~promote increased participation in~~commit to defaulting to Renewable 100 tier for 100-percent renewable energy.

	2030	2050
GHG Reduction ($MTCO_2e$)	1,550	0

Strategy RE-1 actions:

- Advertise the existence and benefits of East Bay Community Energy (EBCE), especially to new homeowners and renters.
- Support EBCE's outreach to direct access customers to encourage use of carbon-free electricity.
- Work with EBCE to encourage opt-ups to the Renewable 100 (100-percent renewable electricity)

Co-Benefits: Resource conservation, reduced air pollution

RE-2: Residential owner-occupied renewable energy

Promote greater adoption of renewable energy generation and energy storage systems on owner-occupied new and existing homes. Leverage existing solar financing, tax, and rebate opportunities, and consider new financial incentives as needed.

	2030	2050
GHG Reduction ($MTCO_2e$)	320	0

Strategy RE-2 actions:

- For each three-year building code cycle, convene a team ~~to investigate the potential for and draft a~~ to develop reach codes to require owner-occupied residential developments to install renewable energy systems (with exemptions as permitted by the State), including solar photovoltaic or solar water heating and battery storage systems, as needed to exceed State requirements for building energy performance. This team and its consultants will be responsible for researching recent advances in all-electric building and policy, preparing a cost-benefit analysis, and preparing the code update for review and adoption by the City Council.
- Provide education and outreach to residents and contractors on the benefits of pairing battery storage with solar PV systems.
- ~~Explore the feasibility of r~~Reducing solar permitting fees and streamlining the permitting process.
- Explore opportunities for streamlining the battery storage permitting process.
- Provide information to property owners about discounts, incentives, and financing programs for renewable energy systems, including solar bulk purchase programs and financing programs that allow property owners to incrementally pay for renewable energy systems.
- Provide education and outreach to stakeholders on the benefits of retrofitting existing residential buildings to be zero net energy.

Co-Benefits: Cost savings, increased economic vitality, neighborhood resilience

RE-3: Residential rental renewable energy

Prioritize increasing and installing renewable energy generation systems and energy storage systems on rental homes, multi-family buildings, and affordable housing.

	2030	2050
GHG Reduction ($MTCO_2e$)	130	0

Strategy RE-3 actions:

- Promote financing programs that allow tenants to incrementally pay for renewable energy systems.

Co-Benefits: Cost savings, increased economic vitality, neighborhood resilience

RE-4: Non-residential renewable energy

Increase renewable energy generation and energy storage capacity at non-residential properties. Encourage the use of non-fossil fuel backup generation systems as much as possible.

	2030	2050
GHG Reduction ($MTCO_2e$)	10	0

Strategy RE-4 actions:

- For each three-year building code cycle, convene a team to ~~investigate the potential for and draft~~develop a reach code to require new non-residential developments to install renewable energy systems, including solar photovoltaics or solar water heating, as needed to exceed State requirements for building energy performance. This team and its consultants will be responsible for researching recent advances and cost-benefit analyses from Building Decarbonization Coalition in all-electric building and policy, preparing the code update for review and adoption by the City Council, and ensuring that the policy is revised every three years.
- Promote financing programs that allow developers, property owners, and tenants to incrementally pay for renewable energy systems.
- Explore the feasibility of reduc~~eing or eliminating~~ solar permitting fees.
- Work with appropriate property owners to identify potential sites for a microgrid demonstration project. Provide education and outreach to these property owners on

the multiple benefits of developing a microgrid, including reliability, cleaner energy, and cost savings.

- Encourage property owners to pair battery storage systems with PV solar systems via education and contact information of qualified contractors.

Co-Benefits: Cost savings, increased economic vitality, neighborhood resilience

Reducing Auto Dependency (AD)

The private automobile has long dominated San Leandro's transportation landscape. While convenient, private vehicle travel releases significant volumes of GHGs, taxes roads, and poses safety concerns for some members of the community. Diversifying the safe, affordable, accessible, and reliable transportation options available to the San Leandro community makes it easier for all residents to participate in public life and gives all community members the freedom to choose transportation modes that promote health, reduce fuel costs and time lost in traffic, and help the City meet its climate action goals. The CAP aims to reduce auto dependency primarily by promoting urban density, which, by clustering key travel destinations, ensures that residents are able to reach home, work, school, and shopping without relying on a private vehicle.

AD-1: Traffic calming

Continue to provide the Neighborhood Traffic Calming Program and related efforts to reduce travel speeds and cut-through traffic in residential areas.

	2030	2050
GHG Reduction ($MTCO_2e$)	770	710

Strategy AD-1 actions:

- Work with residents to identify locations for traffic-calming projects.
- Encourage developers to integrate traffic calming measures into new development when not required outright by conditions of approval and/or mitigation.
- Continue to provide adequate funding to construct new and monitor and maintain existing traffic calming measures, pursuing additional sources of funding, as necessary.

Co-Benefits: Active mobility, improved road safety, reduced air pollution

AD-2: Transit-oriented development

Continue to ~~C~~concentrate multi-family development and pedestrian-oriented mixed-use development within existing TOD areas and along major transit corridors.

	2030	2050
GHG Reduction ($MTCO_2e$)	560	1,550

Strategy AD-2 actions:

- Continue to evaluate and implement appropriate development incentives, such as density bonuses, reduced permitting and inspection fees, or streamlined permitting to multi-family and pedestrian-oriented mixed-use development within TOD areas.
- Adopt implementing zoning for the Bay Fair TOD Specific Plan Area to further prioritize development of housing near transit, including affordable housing. Continue to monitor and update TOD guidelines as development conditions change.
- Consistent with SB743, implement methodologies for evaluating and mitigating transportation impacts based on vehicles miles traveled (VMT).

Co-Benefits: Active mobility, green space, improved road safety, reduced air pollution, walkability

AD-3: Infill development

Focus new housing development on underutilized or vacant infill sites on flatter lands and continue to discourage new development in hillside areas.

	2030	2050
GHG Reduction ($MTCO_2e$)	910	1,210

Strategy AD-3 actions:

- Evaluate and implement appropriate development incentives, such as density bonuses, to new housing development on underutilized or vacant sites.
- Continue to support homeowners interested in constructing accessory dwelling units (ADUs) on existing single-family properties. Assist interested homeowners through the permitting process.

Co-Benefits: Active mobility, reduced air pollution, walkability

AD-4: Evaluate parking standards

Evaluate parking standards and continue to support shared parking and other efforts to ensure the availability of necessary parking while reducing vehicle miles traveled.

	2030	2050
GHG Reduction ($MTCO_2e$)	820	1,650

Strategy AD-4 actions:

- Support local businesses and building owners in establishing shared parking agreements where permitted.
- ~~Consider e~~Eliminat~~e~~ion ~~of~~ parking minimums and establish parking maximums where appropriate.
- Consider requiring structured parking to be designed for future adaptation to other uses, when feasible.

Co-Benefits: Improved road safety, reduced air pollution

Active and Alternative Transportation (AT)

While reducing auto dependency is a key component of the City's overall transportation emission reduction strategy, providing a safe, fun, and accessible alternative to traditional private vehicle travel is also vital to reducing emissions and promoting transportation equity. The City's approach to promoting alternative transportation acknowledges San Leandro's diverse and dynamic transportation ecosystem, providing support for public transit services, walkability, and the City's bicycle infrastructure as well as emerging technologies such as telecommuting, ridesharing, micro-mobility, and autonomous vehicles. A diverse menu of transportation options will help ensure that low-emissions transportation options are available to members of the San Leandro community from all walks of life.

A bike lane.

AT-1: Transportation Demand Management (TDM)

A bike lane.

~~Encourage~~ Require local employers above a certain number of employees to develop programs that promote ridesharing, flextime, telecommuting, and other means to reduce commute trips and congestion, and target 10% mode shift.

	2030	2050
GHG Reduction ($MTCO_2e$)	120	3,010

Strategy AT-1 actions:

- Require employer and homeowner association (HOA) participation in the San Leandro Transportation Management Organization for the LINKS shuttle as conditions of development.
- Educate existing businesses about ways to reduce vehicle miles traveled and the associated benefits.
- Publicize developments and businesses with successful TDM programs.
- Work with regional partners to fund successful TDM strategies for existing developments that can be implemented with little or no cost to property owners.

Co-Benefits: Access to transit, active mobility, improved road safety, reduced air pollution, walkability

AT-2: Bicycle infrastructure

Expand San Leandro's bicycle network and supportive bicycle infrastructure, including funding buildout of the City's bicycle network as identified in the current Bicycle and Pedestrian Master Plan, to meet commute trip, non-commute trip, and recreational needs.

	2030	2050
GHG Reduction ($MTCO_2e$)	760	820

Strategy AT-2 actions:

- Host bicycle safety and awareness efforts for bicyclists, pedestrians, and drivers.
- Continue to coordinate with local school districts to support the Safe Routes to School program.

- Install and maintain bike racks and long-term bike storage lockers in the public right-of-way and at City and transit facilities. Encourage building owners to provide secure bike parking facilities.
- Regularly solicit resident and employee feedback on potential improvements to the location and safety of the City's bicycle network.
- Continue to secure funding for design and construction of the infrastructure improvements identified in the Bicycle and Pedestrian Master Plan.

San Leandro community members participate in Marina Bike Day.

- Fund, facilitate, and promote city-wide events to promote bike riding.
- Promote incentive programs for trading in old cars for electric bikes or scooters, such as Bay Area Air Quality Management District's *Clean Cars for All* program.
- Improve bicycle safety by incorporating bicycle detection at signalized intersections and ensuring that adequate funding is available for bicycle lanes that are well-maintained.

Co-Benefits: Active mobility, reduced air pollution

AT-3: Active transportation and micro-mobility

~~Explore~~ Commit to implementing bikeshare, scooters, and micro-mobility options, and accompanying creative payment options, such as accepting cash deposits for access.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy AT-3 actions:

- Identify operators for a shared mobility program to provide first- and last-mile connections for residents and commuters. Help operators identify locations for services that will serve all community members.
- Work closely with shared mobility operator(s) to monitor program and encourage ridership.
- Support infrastructure improvements that encourage the use of personal micro-mobility devices in alignment with the Bicycle and Pedestrian Master Plan.

Co-Benefits: Active mobility, reduced air pollution

AT-4: Walkability

Improve walkability of all streets and paths in San Leandro, including removing barriers to walking and adding places of rest and shade. Prioritize new infrastructure and modernized curb ramps in majority people of color census tracts and near assisted living facilities and senior centers.

	2030	2050
GHG Reduction ($MTCO_2e$)	400	530

Strategy AT-4 actions:

- Improve pedestrian safety through education and outreach efforts.
- Continue to coordinate with local school districts to support the Safe Routes to School program.
- Identify strategic sites for median construction or expansion, bulb-out construction, reductions in lane width or number, and other traffic engineering measures to improve pedestrian safety.
- Secure funding for design and construction of the infrastructure improvements identified in the Bicycle and Pedestrian Master Plan.
- Encourage new development to locate work, residences, and services within a convenient walking distance of each other, including allowing an expansion of live-work and work-live uses in existing and future residential developments.

Co-Benefits: Active mobility, improved road safety, reduced air pollution, walkability

AT-5: Public transit

Work collaboratively with AC Transit and BART for abundant, affordable, and accessible public transit through ~~to~~ improved service frequency, coverage, and quality throughout San Leandro. Support efforts to increase schedule integration.

	2030	2050
GHG Reduction ($MTCO_2e$)	3,560	8,800

Strategy AT-5 actions:

BART and bus service in San Leandro.

- Promote the AC Transit EasyPass program to residents.
- Continue to maintain and improve existing bus rapid transit (BRT) routes and identify strategic locations for new BRT routes.
- Work with transit providers to improve the safety and comfort at transit stops.
- In partnership with transit providers, commit to improve transit speeds through ~~continue to explore the feasibility of~~ transit priority signals, dedicated transit lanes, premium amenities, and other infrastructure improvements to speed transit service.
- Increase public transit ridership by facilitating pedestrian and bicycle access to high-quality transit, through such mechanisms as maintaining sidewalks and crosswalks, installing transit stops in areas frequented by pedestrians.
- Work with local transit providers to ensure that services remain affordable to all community members and that flexible payment options are available.
- Evaluate opportunities to provide incentives to local businesses or other incentives with the purchase of a transit pass.
- Encourage employers to reimburse transit costs for employees or provide other incentives.

Co-Benefits: Access to transit, improved road safety, reduced air pollution

AT-6: BART shuttles

Continue LINK and FLEX shuttle bus services connecting BART stations and other major activity centers, including efforts to improve shuttle efficiency and comprehensiveness.

	2030	2050
GHG Reduction ($MTCO_2e$)	Less than 10	Less than 10

Strategy AT-6 actions:

- Promote the benefits of LINK and FLEX shuttle bus services through the City's electronic media systems, at public events, and through targeted outreach to BART riders, major regional employers, senior communities, and recipients of medical services.
- Assist prospective riders in applying for and booking FLEX service.
- Work with LINK and FLEX shuttle bus services to identify opportunities for system expansion and increased route efficiency.

Co-Benefits: Access to transit, improved road safety, reduced air pollution

AT-7: Car sharing

~~Encourage~~ Expand car sharing through additional incentives, location of car sharing sites, and education and outreach.

	2030	2050
GHG Reduction ($MTCO_2e$)	760	700

Strategy AT-7 actions:

- Provide information about the benefits and availability of carsharing and carpooling programs through the City's electronic media systems and at public events.
- Work with major employers, schools, housing developers, community service providers, and others to identify desirable locations for car sharing sites.
- Encourage existing employers to participate in Transportation Demand Management efforts.
- Where feasible, work with partners, developers, and property managers to provide dedicated EV car sharing services in multi-family affordable housing buildings.
- Work with car share providers to establish, maintain, and grow car share availability in San Leandro as appropriate.
- Continue to allow private transportation companies, such as car sharing, electric rental scooters, and similar micro-mobility and bike-sharing programs use of the public right-of-way (i.e., streets and sidewalks), as allowed by the Municipal Code.

Co-Benefits: Cost savings, reduced air pollution

AT-8: Autonomous vehicles

Explore opportunities to effectively reduce GHG emissions associated with autonomous vehicles.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy AT-8 actions:

- As autonomous vehicle fleets are deployed in San Leandro, work with fleet managers to ensure that services are fairly priced and can be accessed through multiple means.
- Evaluate changes to curbside and other parking infrastructure and associated policies to allow for greater use of autonomous vehicles.
- Improve roadways and install supportive infrastructure as needed to improve safety and accessibility for autonomous vehicles.

Co-Benefits: Improved road safety

Transportation Electrification and Low-Carbon Fuels (TE)

A sign for an electric vehicle charging station.

While the City aspires to reduce automobile dependency and ensure that a wide suite of alternative and active transportation options are available, passenger and commercial automobile use will continue to be an ingredient in San Leandro's transportation mix. For the users of these technologies, clean transportation fuels, such as electricity and hydrogen, will be a key part of helping reduce the City's transportation emissions. Ensuring that clean fuels are affordable, accessible, and easy to use means helping the community address the upfront costs of acquiring an electric or other alternative-fuel vehicle and ensuring that refueling infrastructure, such as EV charging stations, are equitably distributed throughout the community. Additionally, the City aims to increase the use of alternative fuels within its own vehicle fleet and promote the use of alternative fuels among transportation providers such as taxis and ridesharing programs.

TE-1: Electric vehicle adoption

Conduct education and outreach to inform members of the public about the availability of EVs, and the economic incentives available to encourage EV adoption.

	2030	2050
GHG Reduction ($MTCO_2e$)	4,~~040~~060	43,000~~5,660~~

Strategy TE-1 actions:

- Provide information about the benefits of EVs and PHEVs through the City's electronic media systems and at public events, including creating opportunities for public EV/PHEV test drives.
- Conduct educational outreach to homeowners, commercial property owners, and developers about the benefits of EV charging stations.
- Identify and distribute resources to assist community members seeking to install an EV charging station on their properties.
- Work with EBCE and other local and regional partners to explore providing additional incentives to community members who purchase an EV or PHEV.

Co-Benefits: Cost savings, reduced air pollution

TE-2: EV charging stations

Increase the availability of publicly accessible EV charging stations at multifamily residential buildings, retail centers, offices, and public facilities.

	2030	2050
GHG Reduction ($MTCO_2e$)	250	430

Strategy TE-2 actions:

- For each three-year building code cycle, ~~consider~~ commit to reach codes as directed by the State or regional agencies to include mandatory EV installed to a capacity equivalent to CalGreen Tier 2~~exceed the State-mandated minimum percentage of EV parking spaces designed to accommodate the future installation of electric vehicle supply equipment in new commercial development~~. Consider universal level 1 EV charging at all multifamily residential developments.

- Promote incentives to encourage the expansion of EV charging infrastructure in existing public and private properties, including parking structures, hotels and motels, and workplaces.
- Partner with other agencies to incentivize property owners to install EV charging stations.
- Install additional public EV charging stations in high-volume and prominent City-owned locations.
- Partner with building owners and property managers to expand EV charging infrastructure in existing buildings.
- Explore options to reduce permit fees for the installation of EV charging infrastructure.
- ~~Explore options for~~Commit to developing a program for installing EV-ready infrastructure whenever the City undertakes major roadway improvements.
- Work with building owners to encourage the provision of free or low-cost EV charging. In situations where free charging is not viable, encourage the adoption of diverse and flexible payment options.

Co-Benefits: Cost savings, reduced air pollution

TE-3: Alternative commercial fuels

Support increases in community-wide uses of biomethane, biofuels from sustainable sources, and other emerging clean fuel technologies.

	2030	2050
GHG Reduction ($MTCO_2e$)	5,040	39,940~~14,960~~

Strategy TE-3 actions:

- Provide information about the benefits of alternative fuels through the City's electronic media systems and at public events.
- Ensure that the Zoning Code remains flexible to permit alternative fueling stations as new fueling technologies become available.

Co-Benefits: Cost savings~~, reduced air pollution~~

TE-4: Municipal fleet fuel reduction

~~Explore ways to f~~Further reduce fossil fuel use in municipal fleet operations.

	2030	2050
GHG Reduction ($MTCO_2e$)	130	680~~390~~

Strategy TE-4 actions:

- Purchase clean fuel vehicles as replacements for gasoline or diesel fleet vehicles as needed.
- Increase EV in the municipal fleet through an administrative protocol for vehicle replacement ~~ordinance~~.

Co-Benefits: Cost savings, reduced air pollution

TE-5: EV financing

Support funding mechanisms (e.g., revolving loan fund, grants, public bank finance) to enable low-income truck owner-operators to upgrade to EVs without undue debt burden.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy TE-5 actions:

- Advertise funding mechanisms to truck owner-operators, assist with application process when applicable, and regularly consult low-income truck owner-operators to ensure that programs are serving their needs.

Co-Benefits: Cost savings, reduced air pollution

TE-6: Electric taxis and TNCs

~~Explore opportunities to P~~promote fuel efficiency and alternative fuels for taxis and Transportation Network Companies (TNCs), including a funding mechanism to support ridesharing drivers to move from fossil-fueled cars to EVs (e.g., require Lyft/Uber to pay for upgrade).

	2030	2050
GHG Reduction ($MTCO_2e$)	6,290~~60~~	6,330~~9,950~~

Strategy TE-6 actions:

- Evaluate opportunities to regulate or incentivize TNCs to increase adoption of EVs as regulatory conditions allow.

Co-Benefits: Cost savings, reduced air pollution

Waste Management (WM)

Efforts to divert waste away from landfills and into composting and recycling programs reduce emissions and help make valuable recycled materials available to the broader community. Expansion of the City's recycling and composting programs helps ensure that residents not only know how to properly dispose of their waste, but always have an easy and accessible way to do so.

WM-1: Increased curbside recycling

Increase participation in curbside recycling programs, including efforts to reduce material contamination and improvements to waste educational programs.

	2030	2050
GHG Reduction ($MTCO_2e$)	7,980	10,880

Strategy WM-1 actions:

- Support expanded recycling programs to accommodate additional material types as economic conditions allow.
- Work with agency and community partners to improve educational efforts around proper disposal of recyclable and compostable materials.
- Support grant funding opportunities and public-private partnerships to ensure that recycling facilities can remain fully funded and that there is local demand for recycled material.
- Provide recycling and food waste collection services at City events, as well as educational material and support to assist with correct recyclable disposal.

Co-Benefits: Resource conservation

WM-2: Curbside composting

Expand participation in composting programs, including partnerships with community organizations such as StopWaste and a mandatory curbside composting program for all businesses.

	2030	2050
GHG Reduction ($MTCO_2e$)	2,670	3,640

Strategy WM-2 actions:

- Provide educational outreach materials to multi-family residents about urging HOA/property managers/owners to support onsite composting programs.
- Support residents interested in home composting and help them obtain compost and composting equipment from local providers, if possible.
- Work with food service facilities to understand barriers to using existing composting programs. Use this clearer perception of roadblocks to mitigate concerns and target incentives more specifically at high food-waste facilities.
- Work with multi-family and commercial property owners to minimize any potential health or cleanliness impacts associated with compost collection bins.
- Explore opportunities to provide a diversion discount to participating commercial and multi-family users to properly incentivize and fully use compost services.
- Provide compost services at City events, as well as educational material and support to assist with correct compost disposal.

Co-Benefits: Resource conservation

WM-3: Recycling expansion

Continue to promote programs for recycling electronic waste and other materials that are not accepted in curbside bins.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy WM-3 actions:

- Host and promote regular collection events for electronic and other specialty waste.
- Provide educational materials describing the benefits of electronic recycling.

- Promote and support programs to provide pre-scheduled curbside collections of specialty waste.
- Encourage local electronic retailers to develop electronic waste collection programs.

Co-Benefits: Resource conservation

Waste Reduction and Reuse (WR)

The most effective way to reduce the volume of GHG emissions released from community waste is to reduce the amount of waste that the community creates. This reduction can take a variety of forms, from reducing the amount of packing used in commercial products, to reimagining alternative uses for items that might otherwise be considered garbage. The types of waste produced within San Leandro are diverse and include food waste, construction and demolition waste, and plastic bags. Strategies to reduce waste must be tailored to reflect the unique uses and composition of each of these materials. Waste reduction and reuse measures reduce emissions by reducing the amount of material that would otherwise decompose in a landfill. They also encourage community-wide creativity, collaboration, and conservation as residents and business owners are inspired to share skills and develop innovative ways to reduce resource use.

WR-1: Waste minimization

Explore emerging opportunities for waste minimization, including maker spaces, material reuse, and tool-lending libraries.

	2030	2050
GHG Reduction ($MTCO_2e$)	2,240	6,300

Strategy WR-1 actions:

- Work with local libraries, community centers, schools, and other community service providers to develop, support, or host maker and/or product repair events.
- Provide funding to local libraries and community centers to acquire tool-lending libraries.
- Support and promote opportunities for material reuse and donation via local salvaged materials retailers, zero-waste community groups, and charitable organizations.
- Continue to support the annual citywide garage sale.
- Explore creating or designating live/work or other spaces dedicated to material repair and upcycling and selling of repaired and upcycled goods.

- Remove land use and other barriers to developing businesses that reuse or repair consumer goods, where doing so will not adversely impact the surrounding residential neighborhood.
- Increase public awareness of and access to opportunities for reuse, product rentals, repair, and donation.

Co-Benefits: Increased civic engagement, local job creation, resource conservation

WR-2: Construction and Demolition waste

Explore opportunities to exceed State requirements for construction and demolition materials by encouraging deconstruction and material reuse.

	2030	2050
GHG Reduction ($MTCO_2e$)	410	730

Strategy WR-2 actions:

- Evaluate, and implement if feasible, a deconstruction requirement to reduce demolition waste from construction and renovation and facilitate material reuse.
- Work with local business groups and contractors to make sure deconstructed waste is made available locally, including in San Leandro, as business opportunities allow.

Co-Benefits: Resource conservation

WR-3: Commercial food waste reduction

Work with restaurants and other food-processing businesses to reduce food waste.

	2030	2050
GHG Reduction ($MTCO_2e$)	340	540

Strategy WR-3 actions:

- ~~Support~~ Enforce SB1383 mandate ~~existing capacity, and develop new capacity,~~ to recover edible food that is otherwise wasted, and distribute that food for human consumption.
- Engage with stakeholders including local food donation, recovery, and collection organizations to build robust collection and food storage capacity, and reliable distribution systems to the populations with the greatest need.

- Engage with food generators such as supermarkets, wholesale distributors, large hotels, institutions, and food-processing businesses, to donate surplus edible food that food recovery partners want or will accept.
- Inform edible surplus food generators about strategies and best practices for preventing wasting surplus food.

Co-Benefits: Conserves resources

WR-4: Industrial waste reduction

Work with business leaders and organizations to reduce industrial waste, including packaging materials.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy WR-4 actions:

- Partner with local manufacturing groups and the Chamber of Commerce to promote outreach and education to businesses to use less packaging, and more durable, local, and low-impact goods, and reusable shipping containers.
- Support lobbying efforts at the state and federal level to reduce packaging and industrial wastes.

Co-Benefits: Local job creation, resource conservation

WR-5: Styrofoam and single-use plastics reduction

Continue to enforce bans on Styrofoam for food-related businesses and explore opportunities to reduce single-use plastic items.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy WR-5 actions:

- Work with regional partners to reduce the prevalence of single-use plastic and ensure that reusable food service ware is the default in dine-in, delivery, and takeout dining.
- Mandate that any single-use food service ware (plates, bowls, cups) and accessories (straws, utensils, condiment cups) are BPI-certified compostable fiber, except in cases where certain materials may be deemed medically necessary or necessary to ensure equal access for persons with disabilities.
- Require that any single-use accessories (straws, utensils, condiment cups) are only available on demand.

- Commission City-branded reusable shopping bags, water bottles, travel mugs and other items that can replace single-use plastic to distribute at public events.
- Educate residents and businesses about the importance of reducing single-use plastic and Styrofoam use.
- Provide and maintain public drinking ~~foundations~~ fountains in high traffic and outdoor recreational areas in order to reduce demand for bottled water.

Co-Benefits: Resource conservation

WR-6: Local compost

Support programs for locally-produced compost, including programs run by local and regional partners.

This is a supportive policy that does not create its own GHG emission reductions.

Local food is celebrated at the San Leandro Cherry Festival.

Strategy WR-6 actions:

- Promote the activities of and services provided by local compost providers at farmer's markets and other City events.
- Direct residents interested in home gardening towards local compost providers.
- Host or support introductory backyard composting classes and workshops at farmer's markets, libraries, and at City events.
- Promote backyard gardening and explore ways to provide more land for community gardening, to support local composting production and food equity.

Co-Benefits: Local job creation, resource conservation

Water Efficiency (WE)

Increasing the efficiency of water use reduces emissions by reducing the amount of energy needed to process, heat, and deliver water. In addition to saving energy, water conservation and efficiency helps protect one of California's most precious resources, and in turn helps the City of San Leandro to be more resilient to drought and water shortage. Meanwhile, individual homes and businesses benefit from reduced utility costs.

WE-1: Reclaimed water

Expand San Leandro's reclaimed water system.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy WE-1 actions:

- Identify funding sources for expansion of the reclaimed water system.
- Identify and rank the priority of different expansion opportunities.

Co-Benefits: Neighborhood resilience, resource conservation

WE-2: Greywater retrofits

Support installation of greywater recycling systems and other systems that capture runoff for domestic use and landscaping.

	2030	2050
GHG Reduction ($MTCO_2e$)	10	40

Strategy WE-2 actions:

- Educate residents and landlords about the benefits of greywater use.
- Provide financial incentives to support the installation of greywater systems and help residents connect to these resources.
- Provide equipment and education for rain harvesting.

Co-Benefits: Neighborhood resilience, resource conservation

WE-3: Water-efficient retrofits

Promote water efficiency in existing homes and businesses.

	2030	2050
GHG Reduction ($MTCO_2e$)	30	50

Strategy WE-3 actions:

- Provide educational materials and outreach to encourage indoor water conservation.
- Work with EBMUD to promote offerings for high-efficiency toilets, washing machines, rain barrels, and other water-consuming appliances.

- Work with EBMUD to offer low-cost or free water audits to businesses and homeowners. Explore ways to encourage installation of greywater systems in existing buildings, especially as part of significant retrofits.

Co-Benefits: Neighborhood resilience, resource conservation

WE-4: New greywater installations

Continue to require water conservation and green infrastructure strategies as a condition of approval for major developments.

	2030	2050
GHG Reduction ($MTCO_2e$)	10	20

Strategy WE-4 actions:

- Evaluate locally-appropriate greywater and other green infrastructure designs for major developments.
- Work with development applicants to incorporate these features into project designs as part of the pre-review process.

Co-Benefits: Neighborhood resilience, resource conservation

Community Consumption (CC)

There is a growing awareness that the products and services people choose to buy can have significant impacts on social and environmental health. Some goods, such as those produced locally using environmentally responsible materials, have low environmental impacts and may even create positive effects by repurposing waste materials. Others, especially those produced far away by polluting industries that rely on environmentally damaging extraction and manufacturing processes, can cause significant harm. Providing community members with information about responsible consumption and supporting more options for responsible goods and services can help cut down on consumption-based GHG emissions and promote a more circular and regenerative economy that benefits both the local and global community.

~~EJ~~CC-1: Environmentally Preferred Purchasing

Continue to promote and enforce Environmentally Preferred Purchasing policies for City operations and encourage community businesses to adopt similar policies.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy ~~EJ~~CC-1 actions:

- Conduct regular audits of the City's Environmentally Preferred Purchasing policies to ensure that they are reflective of current best practices. Make the results of these audits publicly available.
- Minimize the use of GHG refrigerant gases and eliminate use of these gases at City facilities as feasible by 2030.
- Support paperless City operations where feasible.
- Celebrate the achievements of local green businesses.
- Conduct outreach to and provide technical support for businesses seeking to become certified.

Co-Benefits: Resource conservation

~~EJ~~CC-2: Local goods and services
Continue Keep It Local SL campaign efforts and encourage businesses providing a variety of goods and services to locate in San Leandro.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy ~~EJ~~CC-2 actions:

- Work with major retail chains to increase their supply of locally produced goods.
- Work with business groups to identify local sources of various goods and include this information as part of the Keep It Local guide.
- Provide appropriate zoning and incentives to encourage goods production in San Leandro.

Co-Benefits: Increased economic vitality, local job creation, resource conservation

~~EJ~~CC-3: Low-carbon building materials
Work with local, regional, and State partners to expand the awareness of, availability, and cost-effectiveness of low-carbon or carbon-free construction materials.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy ~~EJ~~CC-3 actions:

- Commit to developing a reach code for new construction that limits embodied carbon emissions. In subsequent building code updates, consider implementing improved embodied carbon performance standards including additional materials and materia-

efficient building practices, with exemptions for cost barriers as needed to prevent these changes from directly increasing housing or rent costs.

- Partner with Building Trades Council and other trades affected by building decarbonization when planning strategies.
- Promote rehabilitation and reuse of existing structures, where feasible.

Co-Benefits: Resource conservation

CC-4: ~~Responsible~~ Ccarbon ~~offsets~~sequestration

~~Work with StopWaste and regional partners to establish local carbon offset pilot programs that provide local, verifiable GHG reductions.~~Promote increasing soil carbon and planting high carbon sequestering, climate appropriate species in landscaping projects.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy CC-4 actions:

- In partnership with community groups, establish standards requiring that any carbon ~~offset~~sequestration program support green jobs and a just transition, and ideally be located in and provide benefits to communities that face environmental justice issues.
- Work regionally with partners such as ReScape California and StopWaste to develop and promote a planting guide.
- Conduct a broad educational campaign for the public and professional landscapers.
- ~~Require that carbon offset programs not be used to counteract emissions from the establishment new polluting, extractive, or other harmful industries, or the continued operation of these industries.~~
- ~~Provide support to local, regional, and/or in-state carbon offset programs that are consistent with City climate action goals and targets, including this CAP.~~
- ~~Regularly report on the results of pilot carbon offset programs and identify ways to replace offsets with actual reductions in production-based and consumption-based GHG emissions as soon as possible.~~

Co-Benefits: Increased economic vitality, local job creation

Equity and Just Transition (EJ)

As the effects of global warming intensify around the world, ensuring that San Leandro remains a welcoming and resilient home to diverse families, individuals, and businesses means ensuring that the City's climate action strategies are built on a foundation of justice and equity. Equity, justice, and the climate resilience they engender can take many forms across different sectors and include such measures as supporting local businesses and ensuring that these businesses consider environmental and equity priorities in their purchasing decisions; promoting low-carbon buildings; and ensuring that all members of San Leandro's workforce are prepared to meet the challenges and opportunities of the changing world. Climate action planning really means mobilizing the entire community toward a way of life and way of doing business that will not only be able to weather the disruptions caused by climate change but will continue to thrive far into the future.

EJ-1: Environmentally Preferred Purchasing

Continue to promote and enforce Environmentally Preferred Purchasing policies for City operations and encourage community businesses to adopt similar policies.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy EJ-1 actions:

- Conduct regular audits of the City's Environmentally Preferred Purchasing policies to ensure that they are reflective of current best practices. Make the results of these audits publicly available.
- Minimize the use of GHG refrigerant gases and eliminate use of these gases at City facilities as feasible by 2030.
- Support paperless city operations where feasible.
- Celebrate the achievements of local green businesses.
- Conduct outreach to and provide technical support for businesses seeking to become certified.

Co-Benefits: Resource conservation

EJ-2: Local goods and services

Continue Keep It Local SL campaign efforts and encourage businesses providing a variety of goods and services to locate in San Leandro.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy EJ-2 actions:

~~- Work with major retail chains to increase their supply of locally produced goods.~~

~~- Work with business groups to identify local sources of various goods and include this information as part of the Keep It Local guide.~~

~~- Provide appropriate zoning and incentives to encourage goods production in San Leandro.~~

~~Co-Benefits: Increased economic vitality, local job creation, resource conservation~~

~~**EJ-3: Low-carbon building materials**~~
~~Work with local, regional, and State partners to expand the awareness of, availability, and cost-effectiveness of low-carbon or carbon-free construction materials.~~

~~*This is a supportive policy that does not create its own GHG emission reductions.*~~

~~Strategy EJ-3 actions:~~

~~- Consider adopting a reach code for new construction that limits embodied carbon emissions. In subsequent building code updates, consider implementing improved embodied carbon performance standards including additional materials and material-efficient building practices, with exemptions for cost barriers as needed to prevent these changes from directly increasing housing or rent costs.~~

~~- Promote rehabilitation and reuse of existing structures, where feasible.~~

~~Co-Benefits: Resource conservation~~

EJ-~~4~~1: Green job training

Maximize opportunities for green jobs by supporting workforce training and other economic development activities in a manner that supports labor unions and improved equity.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy EJ-~~4~~-1 actions:

- Provide support for State and federal green jobs programs and efforts to support organized labor.
- Continue to update the Minimum Wage Ordinance to ensure that wages are livable and rise in step with inflation.
- Partner with schools, local non-profits, and community groups to provide green jobs training for local residents, particularly with local Multi-Craft Core Curriculum workforce partners to sustain a green building market with living wage labor standards.

Co-Benefits: Increased civic engagement, increased economic vitality, local job creation

EJ-~~5~~2: Workforce equity

Prioritize formerly incarcerated individuals, individuals with barriers to employment for green workforce development programs through 'ban the box' and other procurement standards. Perform culturally-sensitive targeted outreach for these programs.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy EJ-~~5~~2 actions:

- Audit the City's internal hiring policies to ensure that they promote equity, particularly for formerly incarcerated individuals, individuals with disabilities, and individuals with limited formal education.
- Work with local community groups to reach out to formerly incarcerated individuals and coordinate with businesses to help improve hiring and workforce training for these persons.
- Advocate for regional, State, and federal prison system reform, including alternatives to conventional policing, increased opportunities for employment training for inmates, and bills such as AB 2147 that make former inmates eligible for select public service positions.

Co-Benefits: Increased civic engagement, increased economic vitality, local job creation

EJ-3: Just transition

Work to replace environmentally harmful industries with green jobs in a manner that benefits the health and well-being of workers from these industries.

This is a supportive policy that does not create its own GHG emission reductions.

Strategy EJ-3 actions:

- Make green jobs trainings available, and prioritized to the extent possible, to people currently or recently working in polluting or extractive industries.
- Work with community-based organizations to amend the City's economic development strategy and attract businesses to San Leandro that contribute to a regenerative and circular economy and pay a living wage to workers.
- Commit to use of construction contractor pre-qualifications for City-led capital projects over a certain cost threshold to provide high-road careers for workers.
- Support lobbying efforts to phase out heavily polluting and extractive industries in the region.

Co-Benefits: Increased economic vitality, local job creation, reduced air pollution

Summary of Total GHG Emissions

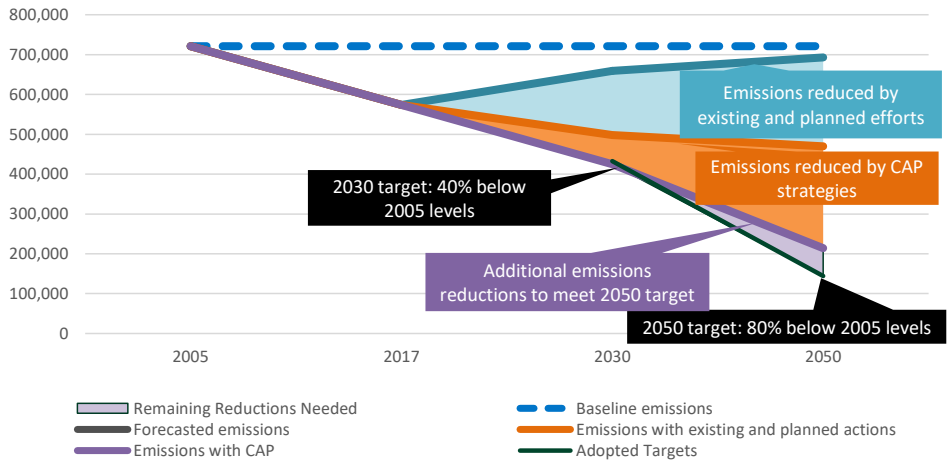
Collectively, the strategies in this chapter achieve substantial GHG reductions for the years 2020, 2030, and 2050. Table ~~9~~ 10 shows the reductions achieved by topic, and **Figure ~~11~~ 12** shows these reductions relative to San Leandro's community-wide emissions.

Table ~~9~~10 GHG Emissions Reductions by Measure Topic, 2020 to 2050 (Absolute) ($MTCO_2e$)

Policy Category	2030	2050
Building Electrification	11,7400~~,180~~	98,74070~~,430~~
Residential Energy Efficiency	13,42013~~,420~~	11,84016~~,060~~
Commercial Energy Efficiency	7,060	13,340~~620~~
Municipal Renewable Energy and Energy Efficiency	70	130
Renewable Energy	2,010	0
Reducing Auto Dependency	3,060	5,120
Active and Alternative Transportation	5,600	13,860
Transportation Electrification and Low-carbon Fuels	15,770~~20~~	90,38031~~,860~~
Waste Management	10,650	14,520
Waste Reduction and Reuse	2,990	7,570
Water Efficiency	50	110
Community Consumption	0	0
Equity and Just Transition	0	0
Total	**72,4200~~,860~~**	**255,610173~~,080~~**

Note: Due to rounding, totals may not equal the sum of the component parts

Figure 12 San Leandro GHG Emissions with Reduction Strategies, 2020 to 2050 (Absolute) ($MTCO_2e$)



PROGRESS TO TARGETS

In total, this CAP is projected to reduce San Leandro's GHG emissions to 42~~56~~,330~~890~~ $MTCO_2e$ by 2030 and to 21~~496~~,170~~700~~ $MTCO_2e$ by 2050, as shown in Table ~~10~~11. This will reduce 2030 emissions to 41 percent below 2005 levels, allowing San Leandro to achieve its adopted 2030 GHG reduction target. Under the CAP, 2050 emissions are reduced to 70~~59~~ percent below 2005 levels.

On its own this does not achieve the City's 2050 GHG reduction target, but it does place San Leandro on a trajectory toward continued GHG emission reduction that will support increased reduction activities in the future. It is likely that there will be new policies and regulations, technologies, personal and economic behaviors and preferences, and other factors that emerge in coming years. These factors cannot be accurately forecasted in this CAP, but they will likely be able to reduce GHG emissions beyond the levels identified here. Future updates to the CAP will be able to better assess the GHG emissions reductions from these factors and include them as part of San Leandro's GHG reduction strategy as appropriate. Future updates to the CAP may include more stringent GHG reduction targets as they are feasible and appropriate.

Table ~~10~~11 Progress Toward Targets

	2030	2050
Baseline Emissions	720,990	720,990
Target	432,590	144,200
Emissions with All Measure Reductions	425~~6~~,330~~890~~	214,170~~96,700~~
Percent Below Baseline	-41~~0~~.01~~79~~%	-70~~58~~.30~~85~~%

While reducing local GHG emissions is an indispensable component~~s~~ of the City's climate action plan, the City also acknowledges that, due to the global nature of climate change, the San Leandro community will continue to be affected by GHG emissions over which it has no direct control. To that end, Chapter 5 highlights the City's strategies for promoting adaptation to climate change.

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5. Climate Change Adaptation Strategies

As discussed in Chapter 3, the City of San Leandro is expected to experience multiple direct impacts of climate change, including potential bayshore flooding, drought, extreme heat, inland flooding, human health hazards, landslide and debris flow, SLR, severe storms, and wildfire. These climate changes can have a variety of harmful impacts to the members of the San Leandro community, including damage to buildings and community-sustaining infrastructures such as roads and energy and water service systems; interruption to work, home life, and other daily activities with consequential economic impacts; and potentially severe public health impacts, including injury, illness, and death resulting from exposure to air pollution, flood waters, fire, disease vectors, and high heat.

Some populations, assets, infrastructures, and services will be more vulnerable to these climate change effects than others. Some of the most vulnerable include residences, businesses, and infrastructure located within flood zones and areas more likely to be affected by SLR, wildfire, or landslide; those especially sensitive to the effects of air pollution and heat; those who lack the economic resources and/or community connections to prepare for and recover from extreme weather events; and those who are regularly exposed to outdoor weather or who might not be able to relocate in the case of an emergency.

The climate change adaptation strategies presented below consider these disparities in climate change vulnerability, as well as knowledge about which climate change effects are most likely to impact the City of San Leandro, their projected severity, and the projected time frame in which these climate changes are expected to occur. They aspire to foster climate change adaptation by reducing the severity of the climate change impacts on the community and by supporting the community's ability to respond to and recover from climate change–related disruption.

These climate change adaptation strategies are organized into six overarching goals that address overall community hazardous conditions preparation and response, public health and safety, resilient development, resilient infrastructure, biological and cultural resources, and future CAP updates. The text of each strategy highlights the climate hazard addressed and population or asset affected.

Case Study: Resilience Hub Leadership Program

The City of San Leandro led an Urban Sustainability Directors Network (USDN) grant-funded project to offer an eight-month leadership training program for community members to develop resilience hubs.

These are community-serving facilities augmented to support residents, coordinate communication, distribute resources, and reduce carbon pollution while enhancing quality of life. Existing community-serving facilities trusted by both community members and City staff can become resilience hubs by increasing their adaptive capacity and augmenting their building systems, such as by installing uninterrupted power systems. When there is a disruption, resilience hubs help meet their neighborhood's diverse and specific needs, which may range from food distribution to shelter. Resilience hubs advance equity by creating power-building opportunities and relying on community leadership and expertise in governance and decision-making processes.

The multiple functions and services that resilience hubs can provide.
Image by Urban Sustainability Directors Network

From October 2020 to January 2021, government partners recruited climate champions and other community leaders, as well as community-based organizations, including those that served low-income and Black Indigenous People of Color. The program's soft launch occurred in January 2021, alongside training to help agencies familiarize themselves with the resilience hub concept and their responsibilities. The program officially kicked off in February 2021 with monthly two-hour training sessions and skill shares. As of April 2021, the resilience hub program has engaged with over 275 community participants, including 49 government staff. Within the City of San Leandro, five hub sites and several individual leaders participated in the program.

CLIMATE CHANGE ADAPTATION STRATEGIES

Adaptation Strategy 1: Improve community-wide preparation and response to hazardous conditions.

Adaptation Strategy 1 Actions

- Establish resilience hubs in equitable locations to provide community members with essential services before, during, and after hazardous events. Use existing, well-known locations, such as the Main Library and the Marina Community Center. These centers can act as cooling centers, smoke and air pollution relief centers, or disaster aid centers. Prioritize establishing resilience hubs in majority people of color neighborhoods first.
  Hazard addressed: All hazards
  Populations or assets addressed: Populations, community services
- Integrate a virtual resilience hub system with the physical resilience hubs, building off of existing virtual systems, to provide the community with a trusted educational source during disasters.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations
- Expand climate change education and information into emergency preparedness and response programs, including topics of climate changes and health.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations
- Use social media outlets to celebrate the success of neighborhood group resiliency efforts.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations
- Coordinate with BayCAN, community-based organizations, and regional coalitions to identify and implement best practices for scenarios with multiple climate/health events at once (such as wildfire smoke, extreme heat, power shutoff, and/or pandemic). Prioritize the concerns of frontline communities by thorough outreach.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations, buildings and facilities
- Develop a training program for all City employees to recognize signs of heat-related illnesses.
  Hazard addressed: Extreme heat
  Populations or assets addressed: Community services

- Coordinate with the ABAG, BCDC, Bay Adapt, and other regional entities to develop relevant, regionally-coordinated SLR adaptation strategies through programs such as Resilient by Design that leverage the results of Adapting to Rising Tides and other programs.
  Hazards addressed: Bayshore flooding, SLR
  Populations or assets addressed: Populations, buildings and facilities, natural resources

- Promote public education and awareness on all aspects of climate resiliency, including the type and extent of climate-related hazards in the community, options to reduce the likelihood of damage and injury, efforts to ensure availability of essential supplies, and effective siting of shelters and medical facilities, among others. Work with local non-profits and the faith community to maximize outreach to individuals or groups who may be unaware of City programs and services.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations

Adaptation Strategy 2: Improve community-wide public health, safety, and well-being and increase resilience of vulnerable populations.

Adaptation Strategy 2 Actions

- Establish a healthy and resilient tree canopy throughout San Leandro through inventories, assessments, management, and tree planting activities. Explore options for public-private partnerships to reduce the cost of tree maintenance and other infrastructure. Develop a Master Tree Plan.
  Hazards addressed: Extreme heat, flooding
  Populations or assets addressed:
  Populations, natural resources

Members of the San Leandro community planting trees.

- Improve public facilities and resource distribution in un-housed communities/encampments, including sanitation, hand-washing stations, bathrooms, waste pickup, hauling infrastructure, etc.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations, natural resources

- Promote and expand food access and garden programs. Partner with existing community groups working on food delivery.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations

- Work with small- and medium-sized businesses to identify and develop, if needed, resources and tools to support the creation of resilient business plans that can help businesses prepare for physical, economic, and human health hazards.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations, buildings and facilities

- Provide a community-wide mapping and assessment tool to help identify where homes may need retrofits or upgrades to improve the health of the living environment. Home retrofit funding programs can then be focused on those neighborhoods with the greatest need.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations, buildings and facilities

- Provide accessible and multi-lingual disaster preparedness information, including printed material, radio broadcasts, video, websites, and other media. Partner with community groups to ensure that information reaches frontline communities.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations

- Coordinate with essential facilities to establish backup power and water resources at shelters, resilience hubs, and cooling centers in case of power outages. Backup power sources should be clean power-based to the greatest extent feasible.
  Hazards addressed: Bayshore flooding, extreme heat, inland flooding, severe storms, wildfire
  Populations or assets addressed: Buildings and facilities, key community services

- Coordinate with community-based organizations and transportation service agencies to develop an evacuation assistance program to support persons with limited mobility or that lack access.
  Hazards addressed: Bayshore flooding, inland flooding, landslides, wildfire
  Populations or assets addressed: Populations

- Coordinate with Alameda County Social Services and other existing programs to ensure that shelters are available for persons experiencing homelessness during extreme events and other highly hazardous conditions. Ensure that the local homeless population is made aware of these resources.
  Hazards addressed: Bayshore flooding, extreme heat, inland flooding, human health hazards, severe storms, wildfire
  Populations or assets addressed: Populations

- Continue to take action to reduce and prevent displacement of residents and businesses by understanding what factors contribute to displacement in San Leandro and developing and supporting programs in conjunction with community partners on the ground.

Hazards addressed: All hazards
Populations or assets addressed: Populations, buildings and facilities

- Offer financial assistance to low-income renters and homeowners for flood and fire insurance.
  Hazards addressed: Bayshore flooding, inland flooding, wildfire
  Populations or assets addressed: Populations

- Work with community partners to map assets, capacity, and gaps in social support systems in local neighborhoods and identify ways to increase systems of support, social capacity, and civic engagement.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations

- Expand participation of Low-Income Weatherization Programs and other support services that provide funding resources for economically-disadvantaged households and businesses. Develop an outreach and educational program to provide community members with information about these resources.
  Hazards addressed: Bayshore flooding, extreme heat, inland flooding, severe weather, wildfire
  Populations or assets addressed: Populations, buildings and facilities

- Identify and remedy poor drainage areas to reduce disease risk from stagnant water. Expand outreach programs to educate communities about potential increases in vector-borne diseases from stagnant water.
  Hazards addressed: Human health hazards
  Populations or assets addressed: Populations

- Coordinate with the community-based environmental justice and health organizations, Department of Toxic Substances Control, Alameda Environmental Health Department, and Alameda County Public Health Department to ensure that industrial and hazardous materials sites will not release pollutants due to flooding, severe weather, landslides, or wildfires.
  Hazards addressed: Bayshore flooding, inland flooding, severe storms, landslides, wildfire
  Populations or assets addressed: Populations, buildings and facilities

- Develop a home and business retrofit program that identifies buildings in need of heat-resilient retrofits and provides building owners with funding for retrofits to ensure that all buildings are habitable during extreme heat conditions.
  Hazard addressed: Extreme heat
  Populations or assets addressed: Populations, buildings and facilities

- Expand air quality monitoring around the community, particularly around frontline neighborhoods. Work with community-based organizations to conduct a community-based risk assessment and address hazards of wildfire smoke.
  Hazard addressed: Wildfire smoke
  Populations or assets addressed: Populations

Adaptation Strategy 3: Improve the resilience of new and existing development to climate risk.

Adaptation Strategy 3 Actions

- Collaborate with landlords and developers to improve energy efficiency and increase resiliency of rental properties.
  Hazards addressed: All hazards
  Populations or assets addressed: Populations, buildings and facilities

- Coordinate with the Alameda County Flood Control and Water Conservation District to ensure that flood channels and storm drainage systems are regularly cleaned and maintained to minimize flood risks to existing development.
  Hazards addressed: Bayshore flooding, inland flooding
  Populations or assets addressed: Buildings and facilities

- Evaluate General Plan policies and the Municipal Code to ensure future development is sited, designed, and constructed to minimize risks associated with physical hazards, including climate hazards identified in the CAP, General Plan, Local Hazard Mitigation Plan, and applicable regional or State plans, reports, or studies.
  Hazards addressed: Bayshore flooding, inland flooding, SLR, wildfires
  Populations or assets addressed: Buildings and facilities

- Develop a Community Wildfire Protection Plan, in coordination with the Alameda County Fire Department and CAL FIRE, that includes vegetation management, site and buildings design standards, and fire prevention strategies.
  Hazard addressed: Wildfire
  Populations or assets addressed: Buildings and facilities

- Implement community-driven wildfire disaster preparedness plans at the neighborhood level, including buddy systems to check on and support transit-dependent people and people with mobility challenges in event of emergency evacuation.
  Hazard addressed: Wildfire
  Populations or assets addressed: Populations

- Develop a fire risk reduction assessment that can be used for new development in fire-prone areas.

Hazard addressed: Wildfire
Populations or assets addressed: Buildings and facilities

- Conduct a watershed analysis to determine areas of insufficient capacity in storm drain and natural creek systems and predict impacts of abnormally high rainfall and SLR as well as to determine suitable locations for green infrastructure.
  Hazards addressed: Bayshore flooding, inland flooding, severe storms, SLR
  Populations or assets addressed: Buildings and facilities

- Review development standards to ensure development within landslide-prone areas does not contribute to higher hazard levels on adjacent or nearby properties. Continue to require drainage and erosion control provisions in such areas to avoid slope failure and to mitigate potential hazards to other properties.
  Hazard addressed: Landslides
  Populations or assets addressed: Buildings and facilities

- Develop a vegetation management program, in coordination with local community-based organizations, to help persons with limited mobility or persons with limited financial means clear vegetation from their properties and maintain fire safe landscaping.
  Hazard addressed: Wildfire
  Populations or assets addressed: Populations, buildings and facilities

- Coordinate with Alameda County Fire Department and Code Enforcement to ensure effective vegetation management by property owners in high fire hazard severity zones.
  Hazard addressed: Wildfire
  Populations or assets addressed: Buildings and facilities

- Ensure that the planning and design of development in very high fire hazard areas minimizes the risks of wildfire and includes adequate provisions for vegetation management, emergency access, and firefighting.
  Hazard addressed: Wildfire
  Populations or assets addressed: Buildings and facilities

- Explore long-term adaptive solutions for properties most at risk from SLR and bayshore flooding.
  Hazard addressed: SLR
  Populations or assets addressed: Populations, buildings and facilities

- Require existing buildings and properties within high fire hazard zones and the wildland-urban interface to be retrofitted and managed to reduce the risk of ignition or spread of wildfires. Prohibit new non-essential construction in this area. Collaborate with the Alameda County Fire Department, and CAL FIRE to develop acceptable thresholds and find funding sources for persons with limited mobility or limited income.

Hazard addressed: Wildfire
Populations or assets addressed: Populations, buildings and facilities

Adaptation Strategy 4: Support greater resilience, redundancy, robustness, and reliability for local and regional infrastructure networks.

Adaptation Strategy 4 Actions

- Study changes along designated evacuation routes associated with more frequent and severe wildfire, inland and bayshore flooding, and landslide events.
  Hazards addressed: Bayshore flooding, inland flooding, landslides, wildfires
  Populations or assets addressed: Buildings and facilities

- Prioritize redundancy of critical transportation routes to allow for continued access and movement in the event of a disaster.
  Hazards addressed: Bayshore flooding, inland flooding, landslides, wildfire
  Populations or assets addressed: Buildings and facilities

- ~~Encourage~~ ~~Enforce~~ Develop requirements for the use of green infrastructure and Low Impact Development to reduce stormwater runoff into the ~~wastewater~~ water pollution treatment plant.
  Hazards addressed: Bayshore flooding, inland flooding, landslides, wildfire
  Populations or assets addressed: Buildings and facilities

- Coordinate with the San Leandro Creek Alliance, AC Transit, East Bay Regional Parks District, and other regional agencies to support BART, railroad, and other infrastructure resiliency.
  Hazards addressed: Bayshore flooding, extreme heat, inland flooding, landslides, severe storms, SLR, wildfire
  Populations or assets addressed: Buildings and facilities

- Coordinate with regional agencies and neighboring jurisdictions on flooding and SLR projects to ensure that San Leandro can develop and/or participate in multi-benefit, multi-jurisdictional projects.
  Hazards addressed: Bayshore flooding, inland flooding, SLR
  Populations or assets addressed: Buildings and facilities, natural resources

- Use the existing fiber optic network in San Leandro to expand internet and Wi-Fi services to all residents and businesses within the City.
  Hazards addressed: All hazards
  Populations or assets addressed: Buildings and facilities

- Review the Capital Improvement Program to see which projects should be implemented at specific climate change hazard trigger points.

Hazards addressed: All hazards
Populations or assets addressed: Buildings and facilities, natural resources, community services

- Continue to implement the Green Infrastructure Plan, as required by the Regional Water Quality Control Board. The Plan should include a mechanism to prioritize and map areas for planned and potential projects, projections for impervious surface reductions, a process for tracking and mapping completed projects, design guidelines and details for green infrastructure projects, an implementation program, and an evaluation of funding options to cover construction and ongoing maintenance.
  Hazards addressed: Bayshore flooding, extreme heat, inland flooding
  Populations or assets addressed: Buildings and facilities

Adaptation Strategy 5: Provide greater protection and reliability for water and energy resources.

Adaptation Strategy 5 Actions

- Continue to advocate for increasing the resilience of electrical transmission lines, at both regional and statewide levels, to ensure that electricity delivery remains intact during extreme heat, severe storms, and wildfires.
  Hazards addressed: Extreme heat, landslides, severe storms, wildfires
  Populations or assets addressed: Buildings and facilities

- Explore the feasibility of a microgrid system at the WPCP and Gate 510 industrial center.
  Hazards addressed: Extreme heat, landslides, severe storms, wildfire
  Populations or assets addressed: Buildings and facilities

- Coordinate with East Bay Community Energy to create a more renewable and resilient electricity supply and prioritize medical baseline customers in solar/storage retrofits for lifesaving electric power during power outages.
  Hazards addressed: Extreme heat, landslides, severe storms, wildfire
  Populations or assets addressed: Buildings and facilities, community services

- Collaborate with EBMUD to ensure continuity of water supplies. Collaborate with EBMUD to also provide financial relief to vulnerable populations if prices rise in drought conditions.
  Hazard addressed: Drought
  Populations or assets addressed: Buildings and facilities, community services

- Install reliable energy resources in the form of renewable energy generation, battery storage systems, smart inverters, energy visualization and control systems, and energy efficient technology at sites with critical energy supply needs.

Hazards addressed: Extreme heat, landslides, severe weather, wildfire
Populations or assets addressed: Buildings and facilities, community services

- Provide incentives or education on the use of alternative sources of water, such as greywater, rainwater, air conditioning condensation, and foundation drainage.
  Hazard addressed: Drought
  Populations or assets addressed: Populations, buildings and facilities

- Continue the expansion of the reclaimed water systems and the delivery of high-quality reclaimed water for landscaping, industrial use, and other non-potable applications as they become financially feasible. Employ advanced technology so that reclaimed water can eventually be made available to all households. Support efforts to maintain and/or improve the high quality of treated effluent at the San Leandro WPCP and the Oro Loma Sanitary Plant, and increase the feasibility and cost-effectiveness of using recycled wastewater for non-potable purposes.
  Hazard addressed: Drought
  Populations or assets addressed: Buildings and facilities

Adaptation Strategy 6: Coordinate with local and regional agencies to improve resilience of biological and cultural resources.

Adaptation Strategy 6 Actions

- Coordinate with the San Leandro WPCP to convert the polishing pond into a multi-benefit treatment wetland.
  Hazards addressed: Bayshore flooding, SLR
  Populations or assets addressed: Natural resources

- Protect pollinator habitat and promote species conservation, including of Monarch butterflies.
  Hazards addressed: Extreme heat, drought, wildfire
  Populations or assets addressed: Natural resources

- Develop a Shoreline Protection Plan, in collaboration with the City of Oakland, Alameda County, and the City of Hayward, to expand and restore wetland habitat and create a more resilient and living shoreline. A living levee should be included, the design of which incorporates natural infrastructure, such as marshlands, to explicitly provide protection to City assets from flooding and SLR.
  Hazards addressed: Bayshore flooding, SLR
  Populations or assets addressed: Buildings and facilities, natural resources

- Collaborate with Alameda County and BCDC to seek funding for sandbank restoration of Long Beach, located near Roberts Landing.

Hazards addressed: Bayshore flooding, SLR
Populations or assets addressed: Natural resources

- Coordinate with Indigenous communities within San Leandro to restore oyster beds along the creek and bayshore to both prevent flooding and provide habitat for oysters as a cultural resource.
  Hazards addressed: Bayshore flooding, inland flooding
  Populations or assets addressed: Natural resources

- Coordinate with indigenous communities and local and regional stakeholders to support restoration efforts as the Oakland/San Leandro Greenway is built out according to the Creek Master Plan.
  Hazards addressed: Bayshore flooding, inland flooding
  Populations or assets addressed: Natural resources

The GHG reduction and climate adaptation strategies described thus far in the document pave the way to a city that is more sustainable, equitable, and resilient. In order to ensure that these strategies are effectively implemented and evaluated, Chapter 6 of this CAP highlights ways to integrate these strategies with the City's and other local plans and initiatives.

Case Study: Sustainability at the Library

Starting March 2021, the San Leandro Public Library partnered with the San Leandro Public Works Office of Sustainability in a community read of Paul Hawken's non-fiction book, *Drawdown: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*. The Library distributed free copies of *Drawdown* (including audio and e-books) to the public in early March.

Advertisements for the library's Book to Action events.

To complement the community read, the Library and Office of Sustainability designed and coordinated a number of community programs, including a kickoff book talk with California State University East Bay's Head of American Indian Studies Program, Professor Enrique Salmón, on his book on ethnobotany, *Iwigara: The Kinship of Plants and People*. Enrique spoke on the importance of documenting Indigenous knowledge of plants and their cultural uses. The presentation was followed by a deep dive into local Ohlone history and a sustainable cooking demonstration with culinary institution Café Ohlone – mak' amham.

Other events included *Drawdown* book discussions, a panel about the local Buy Nothing group, a global virtual Fix-It Clinic, a BikeMobile Bike Talk with youth, a volunteer gardening work day with Dig Deep Farms in San Leandro, and a California-wide virtual screening of *Kiss the Ground*, a documentary about regenerative agriculture and discussion with the award-winning author and director Joshua Tickell.

6. Implementation

To ensure the success of the 2021 CAP update, the City of San Leandro will integrate the goals and strategies of this plan into other local and regional plans, such as BayAdapt, and prioritize and implement the programs and activities identified herein. As the City moves forward with updating other planning documents, such as the General Plan, the Municipal and Zoning Codes, or Specific Plans, staff will ensure that these documents support and are consistent with the CAP.

Implementing the CAP will require City leadership to execute these strategies and report progress. This plan identifies a work plan that includes responsible departments/divisions, time frames, and relative costs associated with each measure. Staff will monitor progress using an implementation and monitoring tool on an annual basis and will provide an annual update to City decision-makers. The strategies in this CAP are accompanied by a list of recommended actions selected by City staff and members of the public. The list of recommended actions represents suggested means of achieving the measure but are not a prescriptive path to implementation. Furthermore, not all of the listed actions may be necessary for the City to achieve its GHG reduction target or support San Leandro's adaptation goals. Due to ongoing changes in technology and regulations, and the emergence of new best practices and funding opportunities, this approach enables the City to adapt and leverage new opportunities or partnerships without being constrained by a specific implementation pathway. The City's Sustainability Manager will serve as an ongoing advisor for CAP implementation. As part of annual progress reports, the Sustainability Manager and City staff will evaluate the effectiveness of each measure to ensure that anticipated reductions are occurring. If reductions do not occur as expected, the City can modify and add additional strategies to the CAP to ensure the reduction target is achieved.

The following strategies and associated actions are designed to guide San Leandro in successfully implementing the CAP.

IMPLEMENTATION STRATEGIES

Implementation Strategy 1: Monitor and report progress toward Climate Action Plan target achievement on an annual basis.

- Assign responsibility for facilitating and supporting CAP implementation to the City's Sustainability Office.
- Identify key staff from each department responsible for supporting the Sustainability Manager with information and updates for annual reporting and monitoring.

- Continue to involve community-based organizations and other key stakeholders in reviewing and recommending CAP action items.
- Prepare an annual progress report on implementation of the recommended GHG reduction strategies for review and consideration by the City Council. When information is available, provide updates on estimated GHG emissions reductions and current GHG emissions levels.

Members of the San Leandro community engaged in collaborative planning and

- Use the CAP implementation and monitoring tool to track GHG benefits from CAP implementation and identify progress toward the CAP reduction target.
- Support regular updates to the regional consumption-based GHG emissions inventory that rely on local and recent data as much as possible. Support efforts to prepare statewide best practices and guidance documents for consumption-based GHG emissions inventories.

Implementation Strategy 2: Continue collaborative partnership with agencies and community groups that support Climate Action Plan implementation.

- Continue formal membership and participate in local and regional organizations that provide tools and support for energy efficiency, energy conservation, GHG emissions reductions, adaptation, public information, and implementation of this CAP.
- At the direction of City Council, commit to formal membership through joint powers authorities or other partnerships to implement high priority strategies from the CAP.
- Provide policy input to partner agencies (e.g., League of Cities) on policy barriers that need to be addressed at the State level.

Implementation Strategy 3: Secure necessary funding to implement the Climate Action Plan

- Identify funding sources and levels for reduction strategies as part of annual reporting.
- Include emissions reduction strategies in department work plans, the capital improvement (CIP) program, and other plans as appropriate.
- Pursue local, regional, State, and federal grants to support implementation.
- Explore dedicated funding sources for CAP implementation.

- Explore opportunities to allocate a portion of revenues from revenue-generating strategies to CAP allocation.

Implementation Strategy 4: Continue to update the baseline emissions inventory and Climate Action Plan every five years.

- Prepare a GHG emissions inventory no later than for the calendar year 2022 that shows GHG emissions after emergency conditions created by the COVID-19 pandemic are expected to have ended.
- Update the CAP within five years of adoption to incorporate new technology, practices, and other options to further reduce emissions. Establish a Resident Advisory Committee to help inform and guide the CAP update process.

Implementation Strategy 5: Maintain and update the San Leandro Climate Action Plan to allow for greater resilience.

- Coordinate updates of the Climate Action Plan, General Plan Safety Element, and Local Hazard Mitigation Plan cycle to ensure plan alignment and coordination of climate mitigation and adaptation efforts.
- Assess the implementation status and effectiveness of adaptation strategies.

WORK PLAN

The Work Plan contains information to support staff and community implementation of the strategies to effectively integrate them into budgets, the capital improvement program, and other programs and projects. The strategies of success are defined as follows:

Strategy Number: The abbreviation that is used to refer to the strategies in the CAP and all corresponding workbooks.

Strategy: The language used to guide actions needed for reductions.

GHG Reductions ($MTCO_2e$): Amount of GHG emissions reduced by 2030 and 2050.

City Staff Time: The estimated cost to the City (in staff hours) to complete implementation of the strategy, ranked as follows:

- Low (less than 80 hours)
- Medium (80 to 500 hours)
- High (more than 500 hours)

Time Frame: The year by which a strategy should be effective by fiscal year's end. The exact status of a strategy will vary based on its actions, and many strategies will be ongoing through and beyond 2030. An effective strategy is one that will be actively on track to

achieve its targeted GHG emissions reductions, support adaptation to climate change effects, or achieve long-term resilience. For a strategy to be effective, the necessary programs and efforts should be active, and any infrastructure or other capital improvements should be in place. The effective year is not the end year, as many of the strategies are programs that are intended to remain in effect for the foreseeable future, and so they do not have end dates. Time frames for effectively setting up the strategies are described as follows:

- Immediate (by 2021-2022)
- Near-Term (by 2023)
- Mid-Term (by 2025)
- Long-Term (by 2030)

Lead Department: the lead City department tasked with implementing the strategy.

Community Partners: Example local organizations that the City will partner with in implementing the given policy. Additional community partners will be welcome.

Although significant GHG reduction policies and initiatives are already in place, the actions proposed in this plan, by necessity, far surpass the scale of existing efforts. Implementing the plan and ensuring that it results in real, additional GHG emissions reductions will require increased coordination across sectors and institutionalizing climate protection efforts across the community.

The large number of strategies and programs recommended in this plan will take many years to implement, given limitations in both staff time and funding. A cost-benefit analysis and prioritization methodology is presented below to assist the City in developing a phased implementation plan. The cost-benefit analysis is based on a subset of the strategies previously detailed in this plan. These strategies were selected by the San Leandro Climate Protection Task Force as warranting further research on costs and magnitude of GHG reduction potential, in order to determine near-term action.

This chapter outlines the main components of the process for turning this plan into action and identifies specific actions from earlier chapters that are recommended for short-term implementation.

While short-term priorities are illustrated, please note that priorities can and do shift based on funding availability, advances in technology, new and better ideas, and other reasons. The CAP, and this implementation section, should be considered a living document.

A summary of the implementation work plan for each strategy can be seen in Tables ~~11~~ 12 and ~~12~~13.

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
BE-1	Incentivize significant building retrofits ~~Encourage efforts to construct new or significantly retrofitted buildings~~ with fewer or no natural gas appliances to reduce pollution and increase cost savings.	8,590	93,610~~67,690~~	Medium	Short-term	Sustainability, Planning, Building	EBCE
BE-2	Commit to developing a reach code ~~Explore feasibility of a reach code~~ limiting natural gas use in new construction, or as directed by the State or regional agencies.	3,150~~1,590~~	5,130~~2,740~~	Medium	Long-term	Sustainability, Planning, Building, Economic Development	EBCE

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
RF-1	Increase education and outreach for existing energy efficiency financing mechanisms, including PACE programs and utility programs. ~~Explore the feasibility of additional financial options, including a revolving loan program.~~ Create new financing programs, such as a revolving loan program.	0	0	Low	Short-term	Sustainability	BayREN
RF-2	Prioritize City-funded energy retrofit programs in majority people of color census tracts or high energy cost burdened households.	0	0	Medium	Short-term	Sustainability, Housing	BayREN
RF-3	Continue to promote energy efficiency programs and incentives available to residential property owners.	6,800	870~~3,710~~	Low	Short-term	Sustainability	BayREN

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
RF-4	Work with landlords and tenants' groups to increase energy efficiency and decrease energy costs in rental homes, including multi-family properties. Mitigate displacement risk by strengthening tenant protections, including relocation assistance and right of return for tenants temporarily displaced by housing retrofits. Consider methods such as the green lease to address the split incentive issue and prevent tenants paying for property improvements.	6,620	10,970~~2,350~~	High	Medium-term	Sustainability, Housing	Causa Justa, East Bay Housing Organization

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
CF-1	Improve energy efficiency in nonresidential buildings, including warehousing and manufacturing centers, through programs such as existing incentive programs.	7,060	13,340~~620~~	Medium	Short-term	Sustainability, Economic Development	EBCE, Chamber of Commerce
CF-2	Promote the Green Leases Toolkit and other mechanisms to improve energy efficiency in tenant-occupied nonresidential buildings.	0	0	Low	Short-term	Economic Development	Chamber of Commerce
CF-3	~~Consider opportunities to e~~Expand the effectiveness of and participation in the Alameda County Green Business program.	0	0	Medium	Short-term	Economic Development, Sustainability	Alameda Co Green Business Program

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
ME-1	Continue implementing municipal energy efficiency retrofits, including all-electric buildings and public lighting retrofits~~Explore opportunities for additional municipal energy efficiency retrofits, including all-electric buildings and public lighting retrofits~~.	40	130	Medium	Short-term	Public Works	EBCE, PG&E, DERNetSoft
ME-2	Install additional renewable energy generation and energy storage systems, including solar hot water, at City facilities as appropriate and feasible.	20	0	Low	Medium-term	Public Works and Engineering & Transportation	EBCE, PG&E, BayREN
ME-3	Commit to ~~Explore~~ installation of battery storage systems and microgrids at City facilities for backup energy sources.	10	0	Medium	Medium-term	Public Works and Engineering & Transportation	EBCE, PG&E, DERNetSoft

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
RE-1	Encourage San Leandro households and businesses to switch from PG&E electricity supplies to East Bay Community Energy, and commit to defaulting to Renewable 100 tier for 100-percent renewable ~~, and promote increased participation in Renewable 100 tiers for 100% renewable~~ energy.	1,550	0	Low	Short-term	Sustainability	EBCE
RE-2	Promote greater adoption of renewable energy generation and energy storage systems on owner-occupied new and existing homes. Leverage existing solar financing, tax, and rebate opportunities, and consider new financial incentives as needed.	320	0	Medium	Short-term	Sustainability, Planning, Building	EBCE

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
RE-3	Prioritize increasing and installing renewable energy generation systems and energy storage systems on rental homes, multi-family buildings, and affordable housing.	130	0	Low	Short-term	Planning, Building, Housing	EBCE
RE-4	Increase renewable energy generation and energy storage capacity at non-residential properties. Encourage the use of non-fossil fuel backup generation systems as much as possible.	10	0	Medium	Short-term	Sustainability, Planning, Building	EBCE
AD-1	Continue to provide the Neighborhood Traffic Calming Program and related efforts to reduce travel speeds and cut-through traffic in residential areas.	770	710	Medium	Short-term	Engineering & Transportation	

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
AD-2	Continue to concentrate multi-family development and pedestrian-oriented mixed-use development within existing Transit Oriented Development (TOD) areas and along major transit corridors.	560~~1,280~~	1,550~~3,670~~	Low	Long-term	Planning	
AD-3	Focus new housing development on underutilized or vacant infill sites on flatter lands and continue to discourage new development in hillside areas.	910	1,210	Low	Long-term	Planning, Building	
AD-4	Evaluate parking standards and continue to support shared parking and other efforts to ensure the availability of necessary parking while reducing vehicle miles traveled.	820	1,650	Low	Medium-term	Planning, Engineering & Transportation	

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
AT-1	Require ~~Encourage~~ local employers above a certain number of employees to develop programs that promote ridesharing, flextime, telecommuting, and other means to reduce commute trips and congestion, and target a 10% mode shift.	120	3,010	Low	Short-term	Economic Development, Sustainability	
AT-2	Expand San Leandro's bicycle network and supportive bicycle infrastructure, including funding buildout of the City's bicycle network as identified in the current Bicycle and Pedestrian Master Plan, to meet commute trip, non-commute trip, and recreational needs.	760	820	High	Continuing/ Immediate	Engineering & Transportation, Sustainability	Bike East Bay, Bike Walk SL, SL2050

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
AT-3	Commit to implementing ~~Explore~~ bikeshare, scooters, and micro-mobility options, and accompanying creative payment options, such as accepting cash deposits for access.	0	0	High	Medium-term	Economic Development, Sustainability, Engineering & Transportation	Bike East Bay, Bike Walk SL
AT-4	Improve walkability of all streets and paths in San Leandro, including removing barriers to walking, and adding places of rest and shade. Prioritize new infrastructure and modernized curb ramps in majority people of color census tracts and near assisted living facilities and senior centers.	400	530	High	Long-term	Engineering & Transportation	Bike East Bay, Bike Walk SL

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
AT-5	Work collaboratively with AC Transit and BART for abundant, affordable, and accessible public transit through improved service frequency, coverage, and quality throughout San Leandro. Support efforts to increase schedule integration~~Work collaboratively with AC Transit and BART to improve service frequency, coverage, and quality throughout San Leandro. Support efforts to increase schedule integration~~.	3,560	8,800	Medium	Continuing/ Immediate	Engineering & Transportation	AC Transit, BART
AT-6	Continue LINK and FLEX shuttle bus services connecting BART stations and other major activity centers, including efforts to improve shuttle efficiency and comprehensiveness.	0	0	Medium	Continuing/ Immediate	Economic Development, Recreation and Human Services	AC Transit, BART

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
AT-7	Expand ~~Encourage~~ car sharing through additional incentives, location of car sharing sites, and education and outreach.	760	700	Medium	Short-term	Engineering and Transportation, Economic Development	
AT-8	Explore opportunities to effectively reduce GHG emissions associated with autonomous vehicles.	0	0	Low	Short-term	Engineering and Transportation, Information Technology	TransForm
TE-1	Conduct education and outreach to inform members of the public about the availability of EVs, and the economic incentives available to encourage EV adoption.	4,~~040~~060	43,000~~5,660~~	Low	Continuing/ Immediate	Sustainability	EBCE, PG&E
TE-2	Increase the availability of publicly -accessible EV charging stations at multifamily residential buildings, retail centers, offices, and public facilities.	250	430	Medium	Medium-term	Engineering & Transportation	EBCE, PG&E

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
TE-3	Support increases in community-wide use of biomethane, biofuels from sustainable sources, and other emerging clean fuel technologies.	5,040	39,940~~14,960~~	Medium	Short-term	Sustainability	
TE-4	~~Explore ways to~~ ~~f~~Further reduce fossil fuel use in municipal fleet operations.	130	680~~390~~	Medium	Short-term	Public Works	EBCE, PG&E
TE-5	Support funding mechanisms (e.g., revolving loan fund, grants, public bank finance) to enable low-income truck owner-operators to upgrade to EVs without undue debt burden	0	0	Medium	Long-term	Sustainability	TransForm

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
TE-6	Promote ~~Explore opportunities to promote~~ fuel efficiency and alternative fuels for taxis and Transportation Network Companies (TNCs), including a funding mechanism to support ridesharing drivers to move from fossil fueled cars to EVS (e.g., require Lyft/Uber to pay for upgrade).	6,290~~60~~	6,330~~9,950~~	Medium	Short-term	Sustainability	TransForm
WM-1	Increase participation in curbside recycling programs, including efforts to reduce material contamination and improvements to waste educational programs.	7,980	10,880	Medium	Short-term	Public Works	ACI, Waste Management, StopWaste

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
WM-2	Expand participation in composting programs, including partnerships with community organizations such as StopWaste and a mandatory curbside composting program for all businesses.	2,670	3,640	Medium	Medium-term	Public Works	ACI, Waste Management, StopWaste
WM-3	Continue to promote programs for recycling electronic waste and other materials that are not accepted in curbside bins.	0	0	Medium	Continuing/ Immediate	Public Works	ACI, Waste Management, StopWaste
WR-1	Explore emerging opportunities for waste minimization, including maker spaces, material reuse, and tool-lending libraries.	2,240	6,300	High	Medium-term	Sustainability	Fixit Clinics, StopWaste
WR-2	Explore opportunities to exceed State requirements for construction and demolition materials by encouraging deconstruction and material reuse.	410	730	Medium	Long-term	Building	StopWaste

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
WR-3	Work with restaurants and other food-processing businesses to reduce food waste.	340	540	Medium	Continuing/ Immediate	Public Works	StopWaste
WR-4	Work with business leaders and organizations to reduce industrial waste, including packaging materials.	0	0	Medium	Continuing/ Immediate	Public Works	ACI, Waste Management, StopWaste
WR-5	Continue to enforce bans on Styrofoam for food-related business and explore opportunities to reduce single-use plastic items.	0	0	Low	Continuing/ Immediate	Public Works	StopWaste
WR-6	Support programs for locally produced compost, including programs run by local and regional partners.	0	0	Low	Continuing/ Immediate	Public Works	ACI, Waste Management, StopWaste
WE-1	Expand San Leandro's reclaimed water system.	0	0	High	Long-term	Public Works, Engineering and Transportation	EBMUD

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
WE-2	Support installation of greywater recycling systems and other systems that capture runoff for domestic use and landscaping.	10	40	Medium	Medium-term	Engineering and Transportation, Building	
WE-3	Promote water efficiency retrofits in existing homes and businesses.	30	50	Medium	Continuing/ Immediate	Sustainability	StopWaste
WE-4	Continue to require water conservation and green infrastructure strategies as a condition of approval for major developments.	10	20	Medium	Medium-term	Sustainability, Engineering and Transportation	
~~EJ~~CC-1	Continue to promote and enforce Environmentally Preferred Purchasing policies for City operations and encourage community businesses to adopt similar policies.	0	0	Medium	Continuing/ Immediate	Finance, Sustainability	Alameda County Purchasing Department

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
~~EJ~~CC-2	Continue Keep It Local SL campaign efforts and encourage businesses providing a variety of goods and services to locate in San Leandro.	0	0	Medium	Continuing/ Immediate	Economic Development	Chamber of Commerce
~~EJ~~CC-3	Work with local, regional, and S~~s~~tate partners to expand the awareness of, availability, and cost-effectiveness of low-carbon or carbon-free construction materials.	0	0	Medium	Continuing/ Immediate	Sustainability	StopWaste
CC-4	~~We~~Promote increasing soil carbon and planting high carbon sequestering, climate appropriate species in landscaping projects. ~~rk with StopWaste and regional partners to establish local carbon offset pilot programs that provide local, verifiable GHG reductions.~~	0	0	Medium	Medium-Term	Sustainability, Economic Development	StopWaste, Chamber of Commerce ReScape California

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
EJ-41	Maximize opportunities for green jobs by supporting workforce training and other economic development activities in a manner that supports labor unions and improved equity.	0	0	High	Continuing/ Immediate	Economic Development, Engineering and Transportation, City Manager's Office	SEIU, Alameda County Labor Council, Alameda County Building Trades Council, Rising Sun Center for Opportunity

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
EJ-~~5~~2	Prioritize formerly incarcerated individuals, individuals with barriers to employment for green workforce development programs through 'ban the box' and other procurement standards. Perform culturally sensitive targeted outreach for these programs.	0	0	High	Continuing/ Immediate	Sustainability, Economic Development, Recreation and Human Services, Finance/Procurement?	SEIU, Alameda County Labor Council, Alameda County Building Trades Council, Rising Sun Center for Opportunity, Alameda County Rehabilitation Program

Table ~~11~~12 GHG Reduction Strategy Implementation Work Plan

Measure Number	Strategy Description	2030 GHG Reduction ($MTCO_2e$)	2050 GHG Reduction ($MTCO_2e$)	City Staff Time	Time Frame	Lead Department(s)	Community Partners
EJ-3	Work to replace environmentally harmful industries with green jobs in a manner that benefits the health and well-being of workers from these industries.	0	0	Medium	Continuing/ Immediate	Sustainability, Economic Development, City Manager's Office	SEIU, Alameda County Labor Council, Alameda County Building Trades Council, Rising Sun Center for Opportunity, Chamber of Commerce

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Adaptation Strategy 1: Improve community-wide preparation and response to hazardous conditions						
Establish resilience hubs in equitable locations to provide community members with essential services before, during, and after hazardous events. Use existing, well-known locations, such as the City Library and the Marina Community Center. These centers can act as cooling centers, air pollution relief centers, or disaster aid centers. Prioritize establishing resilience hubs in majority people of color neighborhoods first.	High	Medium-term	Sustainability on outreach coordination, Information Technology support on Wi-Fi capabilities for hubs, Emergency Management on sites	All hazards	Populations, community services	Alameda County, NorCal Resilience Network, BayCAN
Integrate a virtual resilience hub system with the physical resilience hubs, building off of existing virtual systems, to provide the community with a trusted educational source during disasters.	High	Medium-term	Sustainability, Information Technology	All hazards	Populations	USDN, NorCal Resilience Network, BayCAN
Expand climate change education and information into emergency preparedness and response programs, including topics of climate changes and health.	High	Medium-term	Sustainability, Emergency Services	All hazards	Populations	CERT

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Use social media outlets to celebrate the success of neighborhood group resiliency efforts.	Low	Continuing/ Immediate	Sustainability, Public Information Team, City Manager's Office	All hazards	Populations	PilotCity, San Leandro Downtown Association
Coordinate with BayCAN, community-based organizations, and regional coalitions to identify and implement best practices for scenarios with multiple climate/health events at once (such as wildfire smoke, extreme heat, power shutoff, and/or pandemic). Prioritize the concerns of frontline communities.	High	Long-term	Sustainability, Emergency Services, Recreation and Human Services	All hazards	Populations, buildings and facilities	BayCAN, TAG, Alameda County, VOAD
Develop a training program for all City employees to recognize signs of heat-related illnesses.	High	Medium-term	Human Resources	Extreme heat	Community services	Alameda County Public Health
Coordinate with the ABAG, BCDC, Bay Adapt, and other regional entities to develop relevant, regionally-coordinated SLR adaptation strategies through programs such as Resilient by Design, that leverage the results of Adapting to Rising Tides and other programs.	High	Long-term	Sustainability	Bayshore flooding, SLR	Populations, buildings and facilities, natural resources	BayCAN, ABAG, BCDC, BARC, Greenbelt Alliance

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Promote public education and awareness on all aspects of climate resiliency, including the type and extent of climate-related hazards in the community, options to reduce the likelihood of damage and injury, efforts to ensure availability of essential supplies, and effective siting of shelters and medical facilities, among others. Work with local non-profits and the faith community to maximize outreach to individuals or groups who may be unaware of City programs and services.	Medium	Medium-term	Sustainability, Recreation and Human Services, Emergency Services	All hazards	Populations	VOAD, SL Climate Faith Network
Adaptation Strategy 2: Improve community-wide public health, safety, and well-being and increase resilience of vulnerable populations.						
Ensure healthy and resilient tree canopy throughout San Leandro through inventories, assessments, management, and tree planting activities. Explore options for public-private partnerships to reduce cost of tree planting and other infrastructure. Develop a master tree plan.	High	Long-term	Public Works	Extreme heat, flooding	Populations, natural resources	SL2050, 100K Tree Initiative

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Improve public facilities and resource distribution in unhoused communities/encampments, including sanitation, handwashing stations, bathrooms, waste pickup, hauling infrastructure, etc.	High	Medium-term	Public Works, Recreation and Human Services	All hazards	Populations, natural resources	Interfaith Homeless Network
Promote and expand food access and garden programs. Partner with existing community groups working on food delivery.	High	Long-term	Recreation and Human Services	All hazards	Populations	NorCal Resilience Network
Work with small- and medium-sized businesses to identify and develop, if needed, resources and tools to support creation of resilient business plans that can help businesses prepare for physical, economic, and human health hazards.	Medium	Long-term	Economic Development	All hazards	Populations, buildings and facilities	NorCal Resilience Network
Provide a community-wide mapping and assessment tool to help identify where homes may need retrofits or upgrades to improve the health of the living environment. Home retrofit funding programs can then be focused on those neighborhoods with the greatest need.	High	Long-term	Information Technology on GIS support, Sustainability for retrofit funding program	All hazards	Populations, buildings and facilities	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Provide accessible and multi-lingual disaster preparedness information, including printed material, radio broadcasts, video, websites, and other media. Partner with community groups to ensure that information reaches frontline communities.	Medium	Medium-term	Public Information Team, Emergency Services	All hazards	Populations	VOAD, Alameda County Sustainability, San Leandro Faith Climate Network
Coordinate with essential facilities to establish backup power and water resources at shelters, resilience hubs, and cooling centers in case of power outages. Backup power sources should be clean power-based to the greatest extent feasible.	Medium	Medium-term	Emergency Services, Public Works, Recreation and Human Services	Bayshore flooding, extreme heat, inland flooding, severe storms, wildfire	Buildings and facilities, key community services	PG&E, EBCE, NorCal Resilience Network
Coordinate with community-based organizations and transportation service agencies to develop an evacuation assistance program to support persons with limited mobility or that lack access.	Medium	Medium-term	Sustainability, Emergency Services, Recreation and Human Services	Bayshore flooding, inland flooding, landslides, wildfire	Populations	VOAD

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Coordinate with Alameda County Social Services and other existing programs to ensure that shelters are available for persons experiencing homelessness during extreme events and other highly hazardous conditions. Ensure that the local homeless population is made aware of these resources.	Medium	Long-term	Emergency Services on coordination, Public Works on facilities, Recreation and Human Services on staffing	Bayshore flooding, extreme heat, inland flooding, human health hazards, severe storms, wildfire	Populations	Alameda Social Services, VOAD
Continue to take action to reduce and prevent displacement of residents and businesses by understanding what factors contribute to displacement in San Leandro and developing supporting programs in conjunction with community partners on the ground.	High	Continuing/ Immediate	Housing	All hazards	Populations, buildings and facilities	
Offer financial assistance to low-income renters and homeowners for flood and fire insurance.	Medium	Continuing/ Immediate	Housing	Bayshore flooding, inland flooding, wildfire	Populations	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Work with community partners to map assets, capacity, and gaps in social support systems in local neighborhoods and identify ways to increase systems of support, social capacity, and civic engagement.	Medium	Long-term	Sustainability, Information Technology for mapping	All hazards	Populations	San Leandro Coalition for Racial Justice, Unity in the Community, San Leandro Faith Climate Network
Expand participation of Low-Income Weatherization Programs, East Bay Energy Watch programs, and other support services that provide funding resources for economically disadvantaged households and businesses. Develop an outreach and educational program to provide community members with information about these resources.	Medium	Medium-term	Sustainability	Bayshore flooding, extreme heat, inland flooding, severe weather, wildfire	Populations, buildings and facilities	EBCE, StopWaste
Identify and remedy poor drainage areas to reduce disease risk from stagnant water. Expand outreach programs to educate communities about potential increases in vector-borne diseases from stagnant water.	High	Medium-term	Sustainability	Human health hazards	Populations	Alameda County Mosquito Abatement District

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Coordinate with the community-based environmental justice and health organizations, Department of Toxic Substances Control, Alameda Environmental Health Department, and Alameda County Public Health Department to ensure that industrial and hazardous materials sites will not release pollutants due to flooding, severe weather, landslides, or wildfires.	Medium	Long-term	Alameda County Fire District, Environmental Services (Public Works)	Bayshore flooding, inland flooding, severe storms, landslides, wildfire	Populations, buildings and facilities	ACDTSC, ACEHD, ACPHD
Develop a home and business retrofit program that identifies buildings in need of heat-resilient retrofits and provides building owners with funding for retrofits to ensure that all buildings are habitable during extreme heat conditions.	High	Long-term	Sustainability	Extreme heat	Populations, buildings and facilities	BayREN
Expand air quality monitoring around the community, particularly around frontline neighborhoods. Work with community-based organizations to conduct a community-based risk assessment and address hazards of wildfire smoke.	Medium	Medium-term	Sustainability, IT, Public Works	Wildfire smoke	Populations	Educators Collective for Environmental Justice, San Leandro Unified School District, San Leandro 2050, ACDPH

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Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Adaptation Strategy 3: Improve the resilience of new and existing development to climate risk.						
Collaborate with landlords and developers to improve energy efficiency and increase resiliency of rental properties.	Medium	Long-term	Housing	All hazards	Populations, buildings and facilities	BayREN, Bay Real Estate
Coordinate with the Alameda County Flood Control and Water Conservation District to ensure that flood channels and storm drainage systems are regularly cleaned and maintained to minimize flood risks to existing development.	Medium	Long-term	Public Works	Bayshore flooding, inland flooding	Buildings and facilities	AC Flood Control, Water Conservation District, Friends of San Leandro Creek, Adopt a Storm Drain program
Evaluate General Plan policies and the Municipal Code to ensure future development is sited, designed, and constructed to minimize risks associated with physical hazards, including climate hazards identified in the CAP, General Plan, Local Hazard Mitigation, and applicable regional or State plans, reports, or studies.	Low	Continuing/ Immediate	Planning, Building	Bayshore flooding, inland flooding, landslides, SLR, wildfire	Buildings and facilities	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Develop a Community Wildfire Protection Plan, in coordination with Alameda County Fire Department and CAL FIRE, that includes vegetation management, site and buildings design standards, and fire prevention strategies.	High	Medium-term	Emergency Services	Wildfire	Buildings and facilities	FireSafe Councils
Implement community-driven wildfire disaster preparedness plans at the neighborhood level, including buddy systems to check on and support transit-dependent people and people with mobility challenges in event of emergency evacuation.	Medium	Long-term	Emergency Services	Wildfire	Populations	FireSafe Councils
Develop a fire risk reduction assessment that can be used for new development in fire-prone areas.	Medium	Medium-term	Emergency Services, Sustainability, Building, Community Development, Alameda County Fire Department Information Technology	Wildfire	Buildings and facilities	CAL FIRE, AC Fire dept

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Conduct a watershed analysis to determine areas of insufficient capacity in storm drain and natural creek systems and predict impacts of abnormally high rainfall and SLR as well as to determine suitable locations for green infrastructure.	High	Medium-term	Sustainability	Bayshore flooding, inland flooding, severe storms, SLR	Buildings and facilities	Sogorea Te' Land Trust, BayCAN
Review development standards to ensure development within landslide-prone areas does not contribute to higher hazard levels on adjacent or nearby properties. Continue to require drainage and erosion control provisions in such areas to avoid slope failure and to mitigate potential hazards to other properties.	High	Continuing/ Immediate	Building, Engineering and Transportation	Landslides	Buildings and facilities	Alameda County Sheriff's Office
Develop a vegetation management program, in coordination with local community based organizations, to help persons with limited mobility or persons with limited financial means clear vegetation from their properties and maintain fire safe landscaping.	High	Medium-term	Emergency Services, Sustainability	Wildfire	Populations, buildings and facilities	CAL FIRE, AC Fire dept

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Coordinate with Alameda County Fire Department and Code Enforcement to ensure effective vegetation management by property owners in high fire hazard severity zones.	Medium	Medium-term	Building, Code Enforcement	Wildfire	Buildings and facilities	CAL FIRE, AC Fire dept
Ensure that the planning and design of development in very high fire hazard areas minimizes the risks of wildfire and includes adequate provisions for vegetation management, emergency access, and firefighting	Medium	Continuing/ Immediate	Building, Alameda County Fire Department	Wildfire	Buildings and facilities	CAL FIRE, AC Fire dept
Explore long-term adaptive solutions for properties most at risk from SLR and bayshore flooding.	High	Long-term	Sustainability	Sea-level rise	Populations, buildings and facilities	BayCAN

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Require existing buildings and properties within high fire hazard zones and the wildland-urban interface to be retrofitted and managed to reduce the risk of ignition or spread of wildfires. Prohibit new non-essential construction in this area. Collaborate with the Alameda County Fire Department, and CAL FIRE to develop acceptable thresholds and find funding sources for persons with limited mobility or limited income.	Medium	Medium-term	Building	Wildfire	Populations, buildings and facilities	CAL FIRE, AC Fire dept

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Adaptation Strategy 4: Support greater resilience, redundancy, robustness, and reliability for local and regional infrastructure networks.						
Study changes along designated evacuation routes associated with more frequent and severe wildfire, inland and bayshore flooding, and landslide events.	High	Long-term	Sustainability, Emergency Services	Bayshore flooding, inland flooding, landslides, wildfires	Buildings and facilities	
Prioritize redundancy of critical transportation routes to allow for continued access and movement in the event of a disaster.	High	Long-term	Emergency Services, Engineering and Transportation	Bayshore flooding, inland flooding, landslides, wildfires	Buildings and facilities	
~~Encourage~~ Develop requirements for the use of green infrastructure and Low Impact Development to reduce stormwater runoff into the ~~wastewater~~ water pollution treatment plant.	Medium	Continuing/ Immediate	Building, Engineering and Transportation, WPCP	Bayshore flooding, inland flooding, landslides, wildfires	Buildings and facilities	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Coordinate with the San Leandro Creek Alliance, AC Transit, East Bay Regional Parks District, and other regional agencies to support BART, railroad, and other infrastructure resiliency.	Medium	Long-term	Engineering and Transportation, Sustainability	Bayshore flooding, extreme heat, inland flooding, landslides, severe storms, SLR, wildfire	Buildings and facilities	SL Creek Alliance, AC Transit, EBRPD, BART
Coordinate with regional agencies and neighboring jurisdictions on flooding and SLR projects to ensure that San Leandro can develop or participate in multi-benefit, multi-jurisdictional projects.	Medium	Long-term	Sustainability	Bayshore flooding, inland flooding, SLR	Buildings and facilities, natural resources	BayCAN, BCDC
Use the existing fiber optic network in San Leandro to expand internet and Wi-Fi services to all residents and businesses within the City.	Medium	Continuing/ Immediate	Information Technology	All hazards	Buildings and facilities	OSISoft, DERNetSoft
Review the Capital Improvement Program to see which projects should be implemented at specific climate change hazard trigger points.	Low	Continuing/ Immediate	Engineering and Transportation, Public Works	All hazards	Buildings and facilities, natural resources, community services	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Continue to implement the Green Infrastructure Plan, as required by the Regional Water Quality Control Board. The Plan should include a mechanism to prioritize and map areas for planned and potential projects, projections for impervious surface reductions, a process for tracking and mapping completed projects, design guidelines and details for green infrastructure projects, an implementation program, and an evaluation of funding options to cover construction and ongoing maintenance.	High	Continuing/ Immediate	Public Works, Engineering and Transportation	Bayshore flooding, extreme heat, inland flooding	Buildings and facilities	Greenbelt Alliance, ReScape

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Adaptation Strategy 5: Provide greater protection and reliability for water and energy resources.						
Continue to advocate for increasing the resilience of electrical transmission lines, at both regional and statewide levels, to ensure the electricity delivery remains intact during extreme heat, severe storms, and wildfires.	Low	Continuing/ Immediate	Sustainability	Extreme heat, landslides, severe storms, wildfires	Buildings and facilities	PG&E, EBCE
Explore feasibility of a microgrid system at the Water Pollution Control Plant and Gate 510 industrial center.	High	Medium-term	Sustainability, Public Works	Extreme heat, landslides, severe storms, wildfires	Buildings and facilities	Gate510, EBCE, WeAccel
Coordinate with East Bay Community Energy to create a more renewable and resilient electricity supply and prioritize medical baseline customers in solar/storage retrofits for lifesaving electric power during power outages.	Medium	Long-term	Sustainability	Extreme heat, landslides, severe storms, wildfires	Buildings and facilities, community services	EBCE
Collaborate with EBMUD to ensure continuity of water supplies. Collaborate with EBMUD to also provide financial relief to vulnerable populations if prices rise in drought conditions.	Medium	Long-term	Public Works, Emergency Services	Drought	Buildings and facilities, community services	EBMUD

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Install reliable energy resources in the form of renewable energy generation, battery storage systems, smart inverters, energy visualization and control systems, and energy efficient technology at sites with critical energy supply needs.	Medium	Medium-term	Public Works	Extreme heat, landslides, severe weather, wildfire	Buildings and facilities, community services	EBCE
Provide incentives or education on the use of alternative sources of water, such as greywater, rainwater, air conditioning condensation, and foundation drainage.	Low	Medium-term	Public Works	Drought	Populations, buildings and facilities	

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Continue the expansion of the reclaimed water systems and the delivery of high-quality reclaimed water for landscaping, industrial use, and other non-potable applications as they become financially feasible. Employ advanced technology so that reclaimed water can eventually be made available to all households. Support efforts to maintain and/or improve the high quality of treated effluent at the San Leandro Wastewater Treatment Plant and the Oro Loma Sanitary Plant, and increase the feasibility and cost-effectiveness of using recycled wastewater for non-potable purposes.	High	Continuing/ Immediate	Public Works	Drought	Buildings and facilities	
Adaptation Strategy 6: Coordinate with local and regional agencies to improve resilience of biological and cultural resources.						
Coordinate with the San Leandro WPCP to convert the polishing pond into a multi-benefit treatment wetland.	High	Medium-term	Public Works	Bayshore flooding, SLR	Natural resources	
Protect pollinator habitat and promote species conservation, including of Monarch butterflies.	Low	Continuing/ Immediate	Sustainability	Extreme heat, drought, wildfire	Natural resources	Great Old Broads for Wilderness

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Develop a Shoreline Protection Plan, in collaboration with the City of Oakland, Alameda County, and the City of Hayward, to expand and restore wetland habitat and create a more resilient and living shoreline. A living levee should be included, the design of which incorporates natural infrastructure, such as marshlands, to explicitly provide protection to city assets from flooding and SLR.	High	Long-term	Public Works	Bayshore flooding, SLR	Buildings and facilities, natural resources	Oakland, Alameda County, Hayward, BayCAN
Collaborate with Alameda County and BCDC to seek funding for sandbank restoration near Roberts Landing.	Medium	Medium-term	Public Works, Engineering and Transportation	Bayshore flooding, inland flooding	Natural resources	Alameda County, BCDC
Coordinate with indigenous communities within San Leandro to restore oyster beds along the creek and bayshore to both prevent flooding and provide habitat for oysters as a cultural resource.	Medium	Long-term	Sustainability	Bayshore flooding, inland flooding	Natural resources	Sogorea Te' Land Trust

Table ~~12~~13 Climate Adaptation Strategy Implementation Work Plan

Action Description	City Staff Time	Time Frame	Lead Department(s)	Hazards Addressed	Populations or Assets Addressed	Community Partners
Coordinate with indigenous communities and local and regional stakeholders to support restoration efforts as the Oakland/San Leandro Greenway is built out according to the Creek Master Plan.	Medium	Long-term	Sustainability, Recreation and Human Services, Engineering and Transportation	Bayshore flooding, inland flooding	Natural resources	Sogorea Te' Land Trust, City of Oakland, San Leandro Creek Alliance
Adaptation Strategy 7: Maintain and update the San Leandro Climate Action Plan to allow for greater resilience						
Coordinate updates of the Climate Action Plan, General Plan Safety Element, and Local Hazard Mitigation Plan cycle to ensure plan alignment and coordination of climate mitigation and adaptation efforts.	Medium	Long-term	Sustainability, Planning, Emergency Management	All hazards	All Populations and Assets	
Assess the implementation status and effectiveness of adaptation strategies.	Medium	Long-term	Sustainability	All hazards	All Populations and Assets	

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Appendices

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A. Responses to City's Initial Survey

Prior to the first community workshop, the City's Sustainability Office invited San Leandro community members to participate in an online survey. The City hosted an online survey from November to December 2019 and received responses from 195 participants. Tables A-1 through A-5 summarize the results of the online survey.

Table A-1 Results of Initial Survey: Existing Actions

Existing Climate Actions Taken by Survey Participants	Percentage of Respondents
Recycling and compost	77%
LED Light Replacements	58%
Buying Local	53%
Building Insulation/Energy Efficiency Strategies	30%
Line Dry Laundry	25%
Growing Your Own Food	23%

Table A-2 Results of Initial Survey: Transportation

Existing Transportation Modes	Percentage of Respondents
Car	92%
Walking	53%
BART	44%
Lyft/Uber	22%
Buses	21%
Biking	20%

Table A-3 Results of Initial Survey: Barriers

Barriers to Change	Percentage of Respondents
Upfront economic cost for new appliances or upgrades	57%
Do not own the home/building	30%
Lack of knowledge on what to do or who to go to	30%
Not convenient to make change	29%
Lack of role models showing how to make the change	24%
Difficult to access incentive programs	23%

Table A-4 Results of Initial Survey: Respondent Age

Age of Respondent	Percentage of Respondents
18 or younger	44%
19-29	6%
30-39	7%
40-49	9%
50-59	13%
60-69	12%
70+	7%
Decline to state	3%

Table A-5 Results of Initial Survey: Respondent Race

Race of Respondent	Percentage of Respondents
Arab/Middle Eastern	1%
Black/African American	10%
Asian	17%
Pacific Islander	5%
Hispanic/Latinx	23%
Mixed Race	6%
Native American/Indigenous	1%
White	37%
Decline to state	11%

B. Vulnerability Assessment Process

The vulnerability assessment primarily follows the recommended process in the *California Adaptation Planning Guide*, published in 2020 by the California Governor's Office of Emergency Services. This includes a four-step process: (1) characterizing the City's exposure to current and projected climate hazards; (2) identifying potential sensitivities and potential impacts to City populations and assets; (3) evaluating the current ability of the populations and assets to cope with climate impacts, also referred to as its adaptive capacity; and (4) identifying priority vulnerabilities based on systematic scoring. These steps are shown in **Figure B-1**.

Figure B-1 California Adaptation Planning Guide Recommended Model

The vulnerability assessment expands on a previous vulnerability assessment, called the *San Leandro Climate Hazard Assessment*, prepared for San Leandro in 2017. The vulnerability assessment incorporates the results of this 2017 analysis, expanding on it and revising its conclusions where supported by new data or methods.

Step 1. Identify Exposure. The goal of this step is to characterize the community's exposure to current and projected climate change hazards. The climate change hazards included in the vulnerability assessment are **bayshore flooding, drought, extreme heat, inland flooding, human health hazards, landslides, sea-level rise (SLR), severe weather, and wildfire**. (See pages 5 to 11 for hazard descriptions). These hazards are discussed in more detail herein. Some of the hazards are compounding climate change effects where one climate change hazard leads to another, also known as "cascading effects." **Figure B-2** provides an example of these cascading effects.

Figure B-2 Example of Cascading Effects

The climate change hazard data was derived from up-to-date information, including the Cal-Adapt database, the *California Adaptation Planning Guide*, the *California 4th Climate Change Assessment*, and *Adapting to Rising Tides*.

Direct Impacts vs. Indirect Impacts

Direct impacts are those that immediately affect buildings and infrastructure, health or populations, or immediate operations of economic drivers or community services, and they can lead to secondary *indirect impacts* on the broader system or community, including populations or asset types in a different category. For example, severe weather can *directly* damage electrical transmission lines causing power outages.

Projections of climate change hazards rely on multiple scenarios that reflect different levels of GHG emissions and concentrations over time. The Cal-Adapt database, which provides California-specific climate change hazard projections, uses RCP 4.5 for a low emissions scenario and RCP 8.5 for a high emissions scenario. The Governor's Office of Planning and Research *Planning and Investing for a Resilient California* document and the *California Adaptation Planning Guide* recommend using RCP 8.5 for analyses considering impacts through 2050 and 2100, as there are minimal differences between emission scenarios for the first half of the century and for late-century projections this is a more conservative and risk-adverse approach. City staff used the RCP 8.5 scenario as input for global climate models on the Cal-Adapt database and other resources.

Step 2. Identify Sensitivities and Potential Impacts. This step involved evaluating potential future climate change impacts to community populations and assets. City staff first identified a list of populations and assets to include in the assessment, including 14 populations, 25 building and facility types, 4 ecosystems and natural resources, and 6 key community services. Once this list was confirmed, City staff developed an applicability matrix, which looked at which hazards are likely to affect which populations and assets. For example, human health hazards are likely to impact most populations, but it would not physically affect buildings.

After the applicability review, City staff evaluated potential impacts to the applicable populations and community assets. To identify the severity of the impacts of each relevant hazard are on the populations and community assets, City staff considered several different questions that helped ensure the assessment broadly covered a range of potential harm. Based on the results of the impact (IM) assessment, City staff ranked each sensitivity on a five-point scale (0–4) for each relevant exposure. IM0 is the lowest score (lowest impact) and IM4 is the highest score (highest impact). Impact is considered a negative quality, and therefore, a higher impact score means that there is a higher potential for harm to a population or asset. A lower impact score means that there is a lower potential for harm to a population or asset.

Populations

- Children under 10 years of age
- Cost-burdened households
- Households in poverty
- Linguistically isolated populations
- Low-income households
- Outdoor workers
- Persons experiencing homelessness
- Persons living in mobile homes
- Persons with chronic illnesses
- Persons with disabilities
- Persons without access to lifelines
- Renters
- Senior citizens (at least 65 years of age)
- Senior citizens living alone

Buildings and Facilities

- Airports
- BART stations
- Community centers
- Economic assets
- Gas stations
- Government buildings
- Hazardous materials facilities
- Highways and major roads
- Homes and residential structures
- Industrial centers
- Libraries
- Medical centers
- National Shelter System facilities
- Other major employers
- Parks
- Pharmacies
- Places of workshop
- Power lines
- Public safety buildings (police/sheriff, fire stations)
- Railroads and BART
- Restaurants
- Schools
- Shopping centers
- Stormwater pump stations
- Wastewater treatment plant

Natural Resources

- Aquatic
- Conifer forest
- Hardwood woodland
- Herbaceous

Key Community Services

- Communication services
- Emergency medical response
- Energy delivery
- Government administration
- Public safety response
- Water and wastewater

Step 3. Assess Adaptive Capacity. Adaptive capacity is the ability of populations and community assets to prepare for, respond to, and recover from the impacts of climate change. Each population and asset were evaluated for adaptive capacity by considering a series of questions. Based on the results of the adaptive capacity (AC) assessment, City staff ranked each population or asset on a five-point scale (0 to 4), ranging from AC0 (the lowest adaptive capacity) to AC4 (the highest adaptive capacity). Adaptive capacity is considered a positive attribute, so a higher adaptive capacity score will mean that a population or asset may be more adaptable to the hazard. A lower adaptive capacity score means that a population or asset may have a harder time adjusting to the changing conditions.

Step 4. Prioritize Vulnerability Scoring. City staff used the impact and adaptive capacity scores for each population and asset for each relevant hazard to determine the vulnerability score. The vulnerability (V) score reflects how susceptible a population or asset is to harm from a particular hazard. Vulnerability is assessed on a scale of V1 (minimal vulnerability) to V5 (severe vulnerability). The matrix in **Table B-1** shows how impact and adaptive capacity scores combine and translate into a vulnerability score.

Table B-1 Vulnerability Scoring Matrix

		Impact Score				
		IM0	IM1	IM2	IM3	IM4
Adaptive Capacity Score	AC0	V3	V4	V5	V5	V5
	AC1	V2	V3	V4	V5	V5
	AC2	V1	V2	V3	V4	V5
	AC3	V1	V1	V2	V3	V4
	AC4	V1	V1	V1	V2	V3

C. GHG Technical Appendix

This appendix provides details for the greenhouse gas (GHG) emissions inventory and forecast and summarizes the data sources, assumptions, and performance metrics used to calculate the potential for GHG savings from the community-wide reduction strategies in the San Leandro Climate Action Plan (CAP). **Chapter 2** of the CAP provides highlights of the GHG inventory and forecast. **Chapter 4** of the CAP provides the full list of measures to reduce GHG emissions.

Technical Data for Inventory and Forecast

The GHG reduction efforts in the CAP are based on the results of the GHG inventory. The inventory is a community-wide inventory, which identifies emissions that result from the activities of San Leandro residents, employees, visitors, and other community members. As part of the preparation of the CAP, the City of San Leandro (City) and its regional partners and technical consultants prepared community-wide GHG inventories for the calendar years 2005, 2010, 2015, and 2017.

INVENTORY METHODS

Activity Data and Emissions Factors

The inventory relies on activity data, which are records of how much of a GHG-generating activity is attributable to San Leandro community members. These data may be directly measured, or they may be modeled. Examples of activity data include the amount of electricity used, vehicle miles traveled (VMT), and solid waste thrown away.

The activity data are combined with emissions factors, which identify the amount of GHGs produced per unit of activity. For example, an emissions factor for electricity use would identify the amount of GHGs produced per kilowatt-hour (kWh) of electricity used. When combined with records of electricity use in San Leandro, this allows the City to determine the GHG emissions associated with community electricity use. Emission factors may be provided by utility companies, State of California or federal agencies, or inventory guidance documents. They may also be estimated if they are not available from other sources.

Inventory Protocols

A series of guidance documents, called protocols, provide recommendations on how to adequately assess GHG emissions. The project team prepared the new GHG inventories and updates to past GHG inventories consistent with the guidance in widely adopted, standard protocol documents. These protocols provide guidance on what activities should be evaluated in the GHG inventories and how emissions from those activities should be

assessed. Using standard methods also allows for an easy comparison of GHG emission levels across multiple years and communities.

The community-wide GHG inventory uses the United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol), which was first developed in 2012 and updated most recently in 2019. The California Governor's Office of Planning and Research encourages cities and counties in California to follow the U.S. Community Protocol for community-wide GHG emissions.

GHG inventories are estimates of GHG emissions based on these standard methods and verified datasets. While they are not direct measurements of GHG emissions, the use of the standard methods identified in the protocols, in combination with accurate data from appropriate sources, allows GHG inventories to provide reliable estimates of local emission levels.

Units of Measurement

These GHG inventories assess emissions in a unit called carbon dioxide equivalent (CO_2e), which is a combined unit of all GHGs analyzed in the inventory. As different GHGs have different effects on the processes that drive climate change, CO_2e is a weighted unit that reflects the relative potency of the different GHGs. These inventories report amounts of GHGs in metric tons of CO_2e ($MTCO_2e$), equal to 1,000 kilograms or approximately 2,205 pounds.

INVENTORY SECTORS

The GHG inventory includes the following sectors:

- Residential energy: Electricity and natural gas used in residential settings, including direct access electricity.
- Nonresidential energy: Electricity and natural gas used in nonresidential settings (e.g., industrial, commercial), including direct access electricity.
- Transportation: On-road vehicle trips on local roads and California highways from both passenger and commercial vehicles.
- Bay Area Rapid Transit (BART): Emissions generated from BART trips.
- Off-road: The use of portable equipment and vehicles that do not travel on roads (e.g., construction vehicles or lawn and garden equipment).
- Waste: Material produced by the community that is deposited in landfills that decompose and produce methane.

- Water and wastewater: Energy used to treat and pump water used and wastewater created, along with emissions from the processing of wastewater.
- Biomass sequestration: GHG emissions absorbed by natural lands and street trees in San Leandro. Since emissions are removed from the atmosphere, the values of this sector are negative. This is an informational item and is not included in the community totals.

Within most of these sectors are smaller categories of activity data and GHG emissions, known as subsectors.

INVENTORY RESULTS

San Leandro's total community-wide emissions were 720,990 $MTCO_2e$ in 2005, declining steadily to 687,860 $MTCO_2e$ in 2010; 609,460 $MTCO_2e$ in 2015; and 573,580 $MTCO_2e$ in 2017 (20 percent below 2005 levels). In all four GHG inventory years, transportation was the largest source of emissions, regularly accounting for between 50 and 60 percent of community-wide emissions. Nonresidential energy was the next-largest source, making up between 15 and 25 percent of emissions, followed by residential energy (13 to 15 percent). Other sources of emissions were waste (6 to 7 percent), off-road equipment (3 to 5 percent), BART (1 percent or less), and water and wastewater (less than 1 percent). **Table C-1** shows the results of the inventory for all four years.

Table C-1 San Leandro Community GHG Emissions

Sector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Transportation	363,550	372,220	353,130	344,290	-5%
Nonresidential energy	182,950	146,600	96,490	88,620	-52%
Residential energy	101,760	100,650	83,830	73,320	-28%
Waste	46,910	40,080	38,880	34,860	-26%
Off-road	23,190	22,860	30,940	26,970	16%
BART	2,920	3,030	3,720	3,710	27%
Water and wastewater	-	2,410	2,470	1,820	-25%*
Total	**720,990**	**687,860**	**609,460**	**573,580**	**20%**
Biomass sequestration †	-530	-530	-530	-530	0%

* Water and wastewater data are not available for 2005. The change shown is from 2010 to 2017.

† Informational item not included in the community total.

Due to rounding, the total value may not equal the sum of individual rows.

Most sectors saw substantial changes in GHG emissions from 2005 to 2017, with emissions increasing or decreasing by at least 10 percent. The large decline in nonresidential energy is due to increased renewable energy supplies, which reduced GHG emissions even though total nonresidential electricity use did not change by very much. There was also a significant decrease in nonresidential natural gas use, which may be due to changing economic activities in San Leandro but could also be associated with changes in the types of nonresidential energy data that the Pacific Gas and Electric Company (PG&E) provides. Residential energy use saw a decline in emissions due to increased renewable energy supplies and a slight decrease in natural gas use (potentially due to increased efficiencies and changing heating demands). Emissions from waste decreased because San Leandro community members generated less trash, potentially because of increased awareness and more effective recycling and composting programs. Water and wastewater emissions decreased because the electricity use to process and move water and wastewater came from cleaner sources.

Two sources saw large increases in emissions: off-road and BART. Increases in these sectors are largely due to continued population growth and increased economic activity in San Leandro. Biomass sequestration remained unchanged from 2005 to 2017, as there were no changes in the amount of open space land in San Leandro and no substantive changes in the local urban forest.

Transportation

The transportation sector covers on-road vehicle activity, including gasoline and diesel fuel. This includes private vehicles, commercial vehicles (including heavy-duty trucks), public transit buses, and government and institutional fleets. Off-road transportation (rail, air, and water) or off-road vehicles and equipment that do not serve a transportation function (such as construction equipment) are not included in this sector. Electric vehicles are not included here, as the energy use from these vehicles is accounted for in the residential and nonresidential energy sectors.

Transportation activity data is measured in vehicle miles traveled (VMT). It is provided by the Metropolitan Transportation Commission (MTC) and is separated out by light-duty and heavy-duty vehicles. Light-duty vehicles include passenger cars and light trucks, such as pickup trucks and SUVs. Heavy-duty vehicles, which are mostly used for commercial activities, include larger trucks and buses. **Table c-2** shows the activity data for these two subsectors.

Table C-2 San Leandro Transportation Activity Data

Subsector	2005 VMT	2010 VMT	2015 VMT	2017 VMT	Percentage Change, 2005-2017
Passenger vehicles (light-duty)	508,002,580	539,773,530	546,425,820	561,100,190	10%
Commercial vehicles (heavy-duty)	109,470,720	108,488,760	112,078,650	113,412,950	4%
Total	**617,473,300**	**648,262,290**	**658,504,470**	**674,513,140**	**9%**

Due to rounding, the total value may not equal the sum of individual rows.

The emissions factors for both passenger and commercial vehicles are provided by the California Air Resources Board (CARB) and reflect the specific mix of vehicles on the road in Alameda County. These factors generally decline over time as vehicles have become more fuel-efficient. **Table CA-3** shows the emissions factors for San Leandro.

Table C-3 San Leandro Transportation Emissions Factors

Subsector	2005 ($MTCO_2e$/ VMT)	2010 ($MTCO_2e$/ VMT)	2015 ($MTCO_2e$/ VMT)	2017 ($MTCO_2e$/ VMT)	Percentage Change, 2005-2017
Passenger vehicles (light-duty)	0.000399	0.000391	0.000355	0.000338	-15%
Commercial vehicles (heavy-duty)	0.001470	0.001486	0.001422	0.001366	-7%
Total	**0.000589**	**0.000574**	**0.000536**	**0.000510**	**-13%**

Both passenger and commercial vehicles saw a slight decline in GHG emissions from 2005 to 2017 despite an increase in VMT, due to greater fuel efficiency. **Table CA-4** shows the GHG emissions by transportation subsector.

Table C-4 San Leandro Transportation GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Passenger vehicles (light-duty)	202,670	211,020	193,770	189,380	-7%
Commercial vehicles (heavy-duty)	160,880	161,200	159,360	154,910	-4%
Total	**363,550**	**372,220**	**353,130**	**344,290**	**-5%**

Due to rounding, the total value may not equal the sum of individual rows.

Nonresidential energy

The nonresidential energy sector covers energy use in businesses and other nonresidential facilities in San Leandro, including retail shops, offices, restaurants, and industrial operations. The two types of energy included in this sector are electricity (measured in kWh) and natural gas (measured in therms). Nonresidential energy activity data is provided by PG&E, which was the single provider of electricity and natural gas to San Leandro during the inventory period. East Bay Community Energy (EBCE), which is currently the default electricity provider in San Leandro, did not begin supplying electricity until 2018.

As previously noted, nonresidential natural gas use declined substantially from 2005 to 2017. This may be due to changes in economic activity but could also be related to how PG&E processes energy use data and omits data to comply with privacy regulations. While PG&E did not report omitting any data in 2017 (although data were omitted in 2015, hence the even-lower 2015 nonresidential natural gas use figure), there may still be differences in how data is reported between 2005 and 2017. **Table C-5** show the nonresidential energy activity data.

Table C-5 San Leandro Nonresidential Energy Activity Data

Subsector	2005	2010	2015	2017	Percentage Change, 2005-2017
Nonresidential electricity (kWh)	369,736,450	345,727,630	363,382,990	355,418,880	-4%
Nonresidential natural gas (therms)	18,913,360	14,393,440	5,538,870	10,238,170	-46%

Emission factors for both electricity and natural gas were provided by PG&E. The emissions factor for electricity decreased over the inventory period due to an increased supply of electricity from renewable and other low-carbon and carbon-free sources. The emissions factor for natural gas remained unchanged. **Table C-6** shows the emissions factors for nonresidential energy.

Table C-6 San Leandro Nonresidential Energy Emissions Factors

Subsector	2005	2010	2015	2017	Percentage Change, 2005-2017
Nonresidential electricity ($MTCO_2e$/kWh)	0.000223	0.000203	0.000185	0.000096	-57%
Nonresidential natural gas ($MTCO_2e$/therm)	0.005311	0.005311	0.005311	0.005311	0%

GHG emissions from nonresidential energy use saw a significant decline from 2005 to 2017. The decrease in electricity-related emissions is due to cleaner sources of electricity, while the decline in natural gas emissions is a result of the much lower amount of natural gas use that PG&E reported. **Table C-7** shows the GHG emissions by nonresidential energy subsector.

Table C-7 San Leandro Nonresidential Energy GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Nonresidential electricity	82,510	70,160	67,080	34,250	-58%
Nonresidential natural gas	100,440	76,440	29,410	54,370	-46%
Total	**182,950**	**146,600**	**96,490**	**88,620**	**-52%**

Due to rounding, the total value may not equal the sum of individual rows.

Residential energy

The residential energy sector covers energy use in homes, apartments, and other residential units in San Leandro. As with the nonresidential energy sector, the residential energy sector includes electricity and natural gas. Both electricity and natural gas data were provided by PG&E. **Table C-8** shows the residential energy activity data.

Table C-8 San Leandro Residential Energy Activity Data

Subsector	2005	2010	2015	2017	Percentage Change, 2005-2017
Residential electricity (kWh)	154,546,430	160,813,090	160,168,530	168,493,640	9%
Residential natural gas (therms)	12,611,480	12,809,250	10,216,960	10,747,770	-15%

Emission factors for both electricity and natural gas were provided by PG&E, and so are the same factors used for the nonresidential energy sector. **Table C-9** shows the emissions factors for residential energy.

Table C-9 San Leandro Residential Energy Emissions Factors

Subsector	2005	2010	2015	2017	Percentage Change, 2005-2017
Residential electricity ($MTCO_2e$/kWh)	0.000223	0.000203	0.000185	0.000096	-57%

Table C-9 San Leandro Residential Energy Emissions Factors

Subsector	2005	2010	2015	2017	Percentage Change, 2005-2017
Residential natural gas ($MTCO_2e$/therm)	0.005311	0.005311	0.005311	0.005311	0%

GHG emissions from residential electricity declined sharply due to significant decreases in the electricity emissions factor, despite an increase in residential electricity use from 2005 to 2017. Natural gas emissions decreased due to lower levels of natural gas use. **Table C-10** shows the GHG emissions by residential energy subsector.

Table C-10 San Leandro Residential Energy GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Residential electricity	34,490	32,630	29,570	16,240	-53%
Residential natural gas	66,970	68,020	54,260	57,080	-15%
Total	**101,460**	**100,650**	**83,830**	**73,320**	**-27%**

Due to rounding, the total value may not equal the sum of individual rows.

Waste

The waste sector covers emissions from decomposing trash generated in San Leandro that is sent to a landfill (known as municipal solid waste, or MSW), as well as decomposition of materials used to cover trash in a landfill (known as alternative daily cover, or ADC). MSW is the waste thrown out by community members, while ADC is added by the landfill operator. This sector does not include any emissions from the decomposition of material that is not landfilled, such as backyard or commercial composting or paper recycling.

Activity data in both subsectors is measured in tons of materials and is provided by StopWaste. MSW has decreased from 2005 to 2017 as greater recycling and composting options have become available and as community behaviors change. ADC has increased, which is likely related to individual decisions by landfill operators and conditions at landfills and is not directly tied to the amount of MSW produced in San Leandro. **Table C-11** shows the activity data for these two subsectors.

Table C-11 San Leandro Waste Activity Data

Subsector	2005 tons	2010 tons	2015 tons	2017 tons	Percentage Change, 2005-2017
MSW	159,240	131,300	130,490	108,030	-32%
ADC	890	4,850	6,320	16,130	1712%
Total	**160,130**	**136,150**	**136,810**	**124,160**	**-22%**

Du to rounding, the total value may not equal the sum of individual rows.

The emissions factors for both MSW and ADC are calculated based on data provided by CARB through an Excel-based tool to estimate GHG emissions from landfills. These emission factors are based on the levels and rates of decomposition of various material types in these two subsector categories. Emission factors for MSW have changed as the mix of different waste types in California change, while the ADC emissions factor has remained constant. **Table C-12** shows the emission factors for San Leandro.

Table C-12 San Leandro Waste Emissions Factors

Subsector	2005 ($MTCO_2e$/ ton)	2010 ($MTCO_2e$/ ton)	2015 ($MTCO_2e$/ ton)	2017 ($MTCO_2e$/ ton)	Percentage Change, 2005-2017
MSW	0.293241	0.296181	0.286047	0.286047	-2%
ADC	0.245694	0.245694	0.245694	0.245694	0%
Total	**0.292949**	**0.294381**	**0.284117**	**0.280767**	**-4%**

Emissions associated with MSW have declined as the amount of MSW produced by San Leandro community members has decreased, while ADC emissions have risen due to increased amounts of ADC being applied in landfills. **Table C-13** shows the GHG emissions by transportation subsector.

Table C-13 San Leandro Waste GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
MSW	46,690	38,890	37,320	30,900	-34%
ADC	220	1,190	1,550	3,960	1700%
Total	**46,910**	**40,080**	**38,870**	**34,860**	**-26%**

Due to rounding, the total value may not equal the sum of individual rows.

Off-road

Off-road emissions are emissions produced by vehicles and equipment that are not used for on-road transportation, due to the fuel use of these vehicles and equipment. Electric equipment is not included here, as the energy use from these pieces of equipment is accounted for in the residential and nonresidential energy sectors. The subsectors of equipment assessed in the San Leandro GHG inventory are:

- Construction and mining equipment, such as backhoes, cement mixers, and cranes.
- Entertainment equipment, which is only generators used for entertainment purposes.
- Industrial equipment, including forklifts, sweepers, and aerial lifts.
- Lawn and garden equipment, such as lawn mowers, chippers, and chainsaws.
- Light commercial equipment, including air compressors, welding equipment, and power washers.
- Pleasure craft, which are personal recreational boats
- Recreational equipment, including golf carts and All-Terrain Vehicles (ATVs).
- Transport Refrigeration Units, which are shipping containers with diesel-powered heating or refrigeration systems.

There are no activity data or emission factors provided for off-road emissions, as emissions are identified directly by CARB through the OFFROAD 2007 modeling software. While CARB has developed newer models and methods to estimate emissions from some categories of off-road equipment, City staff elected to use OFFROAD2007 because it is the only single method that provides comprehensive off-road emissions data.

Emissions from each of these subsectors are associated with specific community activities, which may include population, jobs, land uses, and infrastructure in San Leandro. Changes in individual subsector emissions is associated with changes in these activities and factors in San Leandro relative to Alameda County. **Table C-14** shows the GHG emissions by off-road subsector.

Table C-14 San Leandro Off-road GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Construction and mining equipment	9,080	7,900	14,100	9,790	8%
Entertainment equipment	50	50	50	50	0%
Industrial equipment	6,680	6,920	7,440	7,620	14%
Lawn and garden equipment	1,690	1,670	1,700	1,660	-2%

Table C-14 San Leandro Off-road GHG Emissions

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Light commercial equipment	2,850	2,820	3,340	3,410	20%
Pleasure craft	890	1,030	1,180	1,200	35%
Recreational equipment	220	270	310	320	45%
Transport Refrigeration Units	1,730	2,200	2,810	2,910	68%
Total	**23,190**	**22,860**	**30,930**	**26,960**	**16%**

Due to rounding, the total value may not equal the sum of individual rows.

Bay Area Rapid Transit

Emissions from the BART sector are those associated with operating BART trains for passenger service. It does not include any other activities associated with BART operations, including the electricity and natural gas used by BART administrative offices and maintenance yards (except electricity directly used for powering trains), as this is included in the Energy sector. Emissions from BART's on-road vehicle fleet and employee commute are included in the Transportation sector.

Activity data for the BART sector are the annual passenger miles ridden on the BART system from San Leandro community members. This primarily covers activity at the Bay Fair and San Leandro BART stations, but also includes ridership at the Castro Valley, Fruitvale, Hayward, and Lake Merritt stations. Ridership data is up at all stations, owing to increased population growth in San Leandro and overall increases in BART ridership system-wide. **Table C-15** shows the annual passenger miles on BART from San Leandro community members, organized by station.

Table C-15 San Leandro BART Activity Data

Subsector	2005 passenger miles	2010 passenger miles	2015 passenger miles	2017 passenger miles	Percentage Change, 2005-2017
Bay Fair	13,301,700	13,887,120	16,866,450	16,053,090	21%
Castro Valley	253,260	269,840	344,460	330,910	31%
Fruitvale	160,340	160,130	206,820	194,130	21%
Hayward	156,510	153,310	199,080	186,060	19%
Lake Merritt	156,810	171,320	235,940	218,630	39%
San Leandro	17,427,140	18,042,120	22,244,900	23,002,200	32%

Table C-15 San Leandro BART Activity Data

Subsector	2005 passenger miles	2010 passenger miles	2015 passenger miles	2017 passenger miles	Percentage Change, 2005-2017
Total	**31,455,760**	**32,683,920**	**40,097,660**	**39,985,030**	**27%**

Due to rounding, the total value may not equal the sum of individual rows.

BART's emissions factor for the years 2005 to 2017 comes from the agency's online carbon calculator. BART trains are powered by electricity from multiple sources. Although BART began purchasing cleaner sources of electricity in 2017, it is not clear exactly when this began. As a result, it is assumed that this transition to cleaner sources did not begin until 2018, as discussed in the Technical Data for Existing and Planned Local Activities section. The emission factor does not vary by station. **Table C-16** shows the emissions factors for BART.

Table C-16 San Leandro BART Emissions Factors

Subsector	2005 ($MTCO_2e$/ passenger mile)	2010 ($MTCO_2e$/ passenger mile)	2015 ($MTCO_2e$/ passenger mile)	2017 ($MTCO_2e$/ passenger mile)	Percentage Change, 2005-2017
All	0.000093	0.000093	0.000093	0.000093	0%

As the BART emissions factor does not change between 2005 and 2017, changes in overall emissions are a factor of changes in ridership. Note that for the stations with low ridership, the rounding exaggerates the size of the emissions changes. **Table C-17** shows these emissions for BART.

Table C-17 San Leandro BART Emissions Data

Subsector	2005 $MTCO_2e$	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2005-2017
Bay Fair	1,230	1,290	1,560	1,490	21%
Castro Valley	20	30	30	30	50%
Fruitvale	10	10	20	20	100%
Hayward	10	10	20	20	100%
Lake Merritt	10	20	20	20	100%
San Leandro	1,620	1,670	2,060	2,130	31%
Total	**2,920**	**3,030**	**3,720**	**3,710**	**27%**

Due to rounding, the total value may not equal the sum of individual rows.

Water and wastewater

The water and wastewater sector covers emissions associated with water use (as delivered through pipes as a utility service) and wastewater generated by San Leandro's buildings and facilities. This sector does not include emissions associated with water use that is obtained through other means, such as private wells or bottled water purchased at a store. It also does not include wastewater that is discharged into a storm drain, as this water is not treated.

Water and wastewater data were not available for 2005. This section only shows water and wastewater values for 2010, 2015, and 2017.

Moving and processing water and wastewater requires electricity, which typically results in GHG emissions. Emissions associated with electricity use from water and wastewater activities are referred to as "indirect" and are measured in kWh. Emissions that occur when material in wastewater are broken down and treated are referred to as "direct," since these emissions occur as an immediate consequence of the treatment activities. There is no activity data associated with direct emissions. **Table C-18** shows the activity data for the water and wastewater sector.

Table C-18 San Leandro Water and Wastewater Activity Data

Subsector	2010	2015	2017	Percentage Change, 2010-2017
Indirect water (kWh)	5,226,120	6,353,760	6,337,530	21%
Indirect wastewater (kWh)	2,208,040	1,903,730	2,938,600	33%
Direct wastewater	-	-	-	-
Total	**7,434,160**	**8,257,490**	**9,276,130**	**25%**

Table C-18 San Leandro Water and Wastewater Activity Data

Subsector	2010	2015	2017	Percentage Change, 2010-2017

Due to rounding, the total value may not equal the sum of individual rows.

As emissions from water and wastewater are a consequence of electricity use, the emission factors for indirect water and wastewater are the same as the PG&E residential and nonresidential electricity factor. There are no emission factors for direct wastewater emissions. **Table C-19** shows emissions factors for water and wastewater.

Table C-19 San Leandro Water and Wastewater Emission Factors

Subsector	2010 ($MTCO_2e$/ kWh)	2015 ($MTCO_2e$/ kWh)	2017 ($MTCO_2e$/ kWh)	Percentage Change, 2010-2017
Indirect water	0.000203	0.000185	0.000096	-53%
Indirect wastewater	0.000203	0.000185	0.000096	-53%
Direct wastewater	-	-	-	-
Total	**0.000203**	**0.000185**	**0.000096**	**-53%**

Due to rounding, the total value may not equal the sum of individual rows.

Emissions associated with MSW have declined as the amount of MSW produced by San Leandro community members has decreased, while ADC emissions have risen due to increased amounts of ADC being applied in landfills. **Table C-20** shows the GHG emissions by transportation subsector.

Table C-20 San Leandro Water and Wastewater Emissions Data

Subsector	2010 $MTCO_2e$	2015 $MTCO_2e$	2017 $MTCO_2e$	Percentage Change, 2010-2017
Indirect water	1,060	1,170	610	-42%
Indirect wastewater	450	350	280	-38%
Direct wastewater	900	950	930	3%
Total	**2,410**	**2,470**	**1,820**	**24%**

Due to rounding, the total value may not equal the sum of individual rows.

FORECAST

A forecast of future GHG emissions helps to ensure consistency with the guidelines for a Qualified GHG Reduction Strategy put forward by the Bay Area Air Quality Management District (BAAQMD). A forecast allows elected officials, City staff, and community members to identify the amount of GHG reductions necessary to achieve future GHG reduction targets and help support long-range community planning efforts. The CAP update includes a forecast for the calendar years 2020, 2030, and 2050.

Conducting an emissions forecast is essential for developing the CAP, since GHG emissions typically increase in future years as population grows without a concerted effort to implement emissions-reduction projects. One must compare future reductions with future emissions levels, not current levels. Therefore, in developing the CAP, the City of San Leandro needs to consider projected growth in emissions.

An emissions forecast estimates how emissions would grow over time if no action is taken at the federal, State, or local level to reduce them. A set of indicators determines the extent of growth that could occur and how resulting emissions may change. An emissions forecast was prepared for San Leandro using the best available information regarding indicators and growth rates. The forecast relies on growth assumptions from the California Department of Finance and Association of Bay Area Governments (ABAG) and were approved by City staff, as shown in **Table C-21** Activity data rates in the forecast, such as household energy use, VMT, or per person waste disposal, are based on the 2017 emissions inventory.

Table C-21 San Leandro 2017, 2020, 2030, and 2050 Growth Indicators

Indicator	2017	2020	2030	2050	Percent Change, 2005 to 2050	Source
Population	90,560	98,370	103,910	111,260	36%	Dept of Finance/ Census/ABAG
Households	33,460	35,150	36,180	37,720	22%	Dept of Finance/ Census/ABAG
Jobs	50,310	54,700	57,830	61,450	57%	California EDD/US Census/ABAG
Service Population*	140,870	153,070	161,740	172,710	43%	

* Service population is the sum of the residential population and number of jobs

Each indicator is used to project future emissions for the following sectors:

- Households: Residential energy use, off-road equipment (lawn and garden equipment, pleasure craft, and recreational equipment)
- Jobs: Nonresidential energy use, commercial vehicle use, off-road equipment (entertainment equipment, industrial equipment, light commercial equipment, Transport Refrigeration Units)
- Service Population: Solid waste generation, BART, water, and wastewater
- Change in Service Population: Off-road equipment (construction and mining equipment)

Residential population is not used as an indicator by itself, but it is combined with jobs to calculate service population. Emissions from direct access electricity, point sources, and freight trains are held constant, and are not projected to change over time. Construction and mining emissions, part of the off-road equipment sector, are forecasted by the change in service population. Landfill emissions are based on decomposition rates provided by CARB and are not forecasted by an indicator. Biomass sequestration is associated with the amount of land and level of development in San Leandro. As the city's size is not expected to change, and there are no plans to develop on currently undeveloped land, the amount of GHGs absorbed by biomass sequestration are not projected to change.

The project team applied these indicators to forecast future GHG indicators. Relative to 2017 emissions, San Leandro's GHG emissions are expected to increase by approximately 21 percent by 2050 if no action is taken to reduce emissions. The forecast assumes that each person in San Leandro will continue to contribute the same amount of GHG emissions to the community's total, so that the amount of GHGs released increase in step with population growth of the community. As with the other forecast years, the 2020 forecast is a projection based on 2017 emissions and anticipated growth levels and does not reflect the impacts of the COVID-19 pandemic or any other specific measured activity in 2020. **Table C-22** shows the forecast results by sector.

Table C-22 San Leandro Community GHG Forecast, 2017-2050

Sector	2017 $MTCO_2e$	2020 $MTCO_2e$	2030 $MTCO_2e$	2050 $MTCO_2e$	Change in Emissions, 2017 - 2050
Transportation	344,290	374,140	395,360	421,880	23%
Nonresidential energy	88,620	96,350	101,870	108,250	22%
Residential energy	73,320	77,020	80,650	82,660	13%
Waste	34,860	37,880	40,030	42,740	23%
Off-road	26,960	38,770	34,840	30,540	13%
BART	3,710	4,030	4,260	4,550	23%
Water and wastewater	1,820	1,970	2,090	2,230	23%
Total	**573,580**	**630,160**	**659,100**	**692,850**	**21%**
Biomass sequestration *	-530	-530	-530	-530	0%

* This is an informational item that is not included in the community-wide total.
Due to rounding, the total value may not equal the sum of individual rows.

Tables C-23 and **C-24** shows forecasted activity data and GHG emissions by subsector. BART emissions have been aggregated, as emissions were not forecasted at individual stations.

Table C-23 San Leandro Forecasted Activity Data (2017-2050)

Subsector	2017	2030	2050	Percentage Change, 2017-2050
Passenger vehicles (VMT)	561,100,190	643,815,380	689,355,200	23%
Commercial vehicles (VMT)	113,412,950	130,365,150	138,525,660	22%
Nonresidential electricity (kWh)	355,418,880	408,544,500	434,118,270	22%
Nonresidential natural gas (therms)	10,238,170	11,768,500	12,505,180	22%
Residential electricity (kWh)	168,493,640	185,363,150	189,945,610	13%
Residential natural gas (therms)	10,747,770	11,823,830	12,116,140	13%
MSW (tons)	108,030	124,030	132,450	23%
ADC (tons)	16,130	18,520	19,780	23%
Construction and mining equipment	-	-	-	-
Entertainment equipment	-	-	-	-
Industrial equipment	-	-	-	-
Lawn and garden equipment	-	-	-	-
Light commercial equipment	-	-	-	-
Pleasure craft	-	-	-	-
Recreational equipment	-	-	-	-
Transport Refrigeration Units	-	-	-	-
BART	39,985,030	45,908,840	49,022,610	23%
Indirect water (kWh)	6,337,530	7,276,440	7,769,960	23%
Indirect wastewater (kWh)	2,938,600	3,373,960	3,602,790	23%
Direct wastewater	-	-	-	-

Table C-24 San Leandro Forecasted GHG Emissions (2017-2050)

Subsector	2017	2030	2050	Percentage Change, 2017-2050
Passenger vehicles (VMT)	189,380	217,300	232,670	23%
Commercial vehicles (VMT)	154,910	178,060	189,210	22%
Nonresidential electricity (kWh)	34,250	39,370	41,840	22%
Nonresidential natural gas (therms)	54,370	62,500	66,410	22%
Residential electricity (kWh)	16,240	17,860	18,310	13%
Residential natural gas (therms)	57,080	62,790	64,350	13%
MSW (tons)	30,900	35,480	37,880	23%
ADC (tons)	3,960	4,550	4,860	23%
Construction and mining equipment	9,790	15,180	9,720	-1%
Entertainment equipment	50	60	60	20%
Industrial equipment	7,620	8,760	9,310	22%
Lawn and garden equipment	1,660	1,830	1,870	13%
Light commercial equipment	3,410	3,920	4,170	22%
Pleasure craft	1,200	1,380	1,470	23%
Recreational equipment	320	370	390	22%
Transport Refrigeration Units	2,910	3,340	3,550	22%
BART	3,710	4,260	4,550	23%
Indirect water (kWh)	610	700	750	23%
Indirect wastewater (kWh)	280	320	340	21%
Direct wastewater	930	1,070	1,140	23%
Total	**573,580**	**659,100**	**692,850**	**21%**

Due to rounding, the total value may not equal the sum of individual rows.

Technical Data for Existing and Planned Local Activities

These calculations are based on four primary types of data and research:

- The inventory and forecast of San Leandro's GHG emissions. **Chapter 2** of the CAP contains details on these emissions.
- Reports, guidance documents, and toolkits prepared by government agencies.
- Peer-reviewed reports and other credible research documents.
- Case studies for similar jurisdictions.

The inventory and forecast serve as the foundation for the quantification of San Leandro's GHG reduction measures, supplemented with additional data types and research. The inventory and forecast provide activity data, such as kWh of electricity used or VMT. The project team combined the activity data with data sources that identify the potential for reduction and performance targets that estimate the level of implementation. This provides the total savings in activity data for the years 2030 and 2050. The project team then multiplied the activity data savings by the relevant emissions factor to obtain the total GHG savings from the strategy.

This section discusses the data sources, methods, and assumptions for the quantification of the existing and planned local activities. In addition to the sources presented here, the existing and planned activities also rely on the San Leandro GHG inventory and forecast prepared as part of the regional East Bay Energy Watch inventory and revised as part of the CAP update. Only some existing and planned local activities are quantified. Other activities, not included here, may have GHG reduction benefits but City staff cannot accurately determine the level of reductions.

Table C-25 shows the emissions factors used in the quantification. These emission factors reflect the GHG reductions from existing state accomplishments, such as RPS. Note that the quantification for many measures, especially those that related to electricity, will use multiple emissions factors.

Table C-25 Emissions Factors

Activity Type	Units	2030	2050
Electricity (PG&E)	$MTCO_2e$/kWh	0.000070	0.000000
Electricity (EBCE average)	$MTCO_2e$/kWh	0.000007	0.000000
Electricity (all providers)	$MTCO_2e$/kWh	0.000010	0.000000
Natural gas	$MTCO_2e$/therm	0.005311	0.005311

Activity Type	Units	2030	2050
On-road transportation (passenger vehicles)	$MTCO_2e$/VMT	0.000239	0.000206
On-road transportation (commercial vehicles)	$MTCO_2e$/VMT	0.001065	0.000911
On-road transportation (average)	$MTCO_2e$/VMT	0.000378	0.000324
Solid waste	$MTCO_2e$/ton	0.280814	0.280759

EA 1: EBCE Energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	42,480	35,040

Assumptions

	2030	2050
Residential electricity (PG&E) (kWh)	8,450,899	8,455,867
Residential electricity (EBCE Bright Choice) (kWh)	165,352,955	165,450,158
Residential electricity (EBCE Brilliant 100) (kWh)	1,453,118	1,453,972
Residential electricity (EBCE Renewable 100) (kWh)	381,877	382,102
Nonresidential electricity (PG&E) (kWh)	19,391,643	19,435,382
Nonresidential electricity (EBCE Bright Choice) (kWh)	379,422,990	380,278,804
Nonresidential electricity (EBCE Brilliant 100) (kWh)	3,334,361	3,341,882
Nonresidential electricity (EBCE Renewable 100) (kWh)	876,266	878,242
PGE emissions factor ($MTCO_2e$/kWh)	0.000070	0.000000
EBCE Bright Choice emissions factor ($MTCO_2e$/kWh)	0.000007	0.000000
EBCE Brilliant 100 emissions factor ($MTCO_2e$/kWh)	0.000000	0.000000
EBCE Renewable 100 emissions factor ($MTCO_2e$/kWh)	0.000000	0.000000

EA 2: Municipal energy efficiency retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	3,810,810	3,810,810
GHG savings ($MTCO_2e$)		
GHG savings	30	0

Assumptions

	2030	2050
kWh savings from retrofits to date	3,810,810	3,810,810

EA 3: Streetlight retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	1,370,100	1,370,100
GHG savings ($MTCO_2e$)		
GHG savings	10	0

Assumptions

	2030	2050
Number of streetlights retrofitted	4,570	4,570
Savings per streetlight (kWh)	300	300

EA 4: Renewable energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	20	0

Assumptions

	2030	2050
Residential kW capacity	1,380	1,380
Nonresidential kW capacity	240	240

EA 5: Municipal renewable diesel

Activity and GHG savings

	2030	2050
Activity savings		
Diesel savings (gallons)	11,460	11,460
GHG savings ($MTCO_2e$)		
GHG savings	10	10

Assumptions

	2030	2050
Gallons of diesel replaced with biodiesel	11,460	11,460

EA-6: Shuttles

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	30,130	27,060
GHG savings ($MTCO_2e$)		
GHG savings	10	10

Assumptions

	2030	2050
Increase in shuttle ridership from baseline conditions	4,210	4,210

EA-7: Increase Electric Vehicle adoption

This existing action is supportive, as San Leandro's EV adoption rate does not exceed the level forecasted by the State's GHG reduction efforts. Therefore, there are no additional reductions attributed to San Leandro.

EA-8: Clean BART energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	3,650	4,550

Assumptions

	2030	2050
BART emissions factor ($MTCO_2e$/mile)	0.000013	0.000000

Technical Data for Future Activities

This section discusses the data sources, methods, and assumptions for the quantification of the new strategies identified in the CAP. In addition to the sources presented here, the new strategies also rely on the San Leandro GHG inventory and forecast prepared as part of the CAP. Some of the strategies may not have GHG reductions that City staff are able to accurately determine.

BUILDING ELECTRIFICATION

BE-1: Electrified retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-4,800,380	-51,991,34037,590,210
Natural gas savings (therms)	1,627,260	17,627,0802,750,310
GHG savings ($MTCO_2e$)		
GHG savings	8,590	93,61067,690

Assumptions

	2030	2050
Cumulative % commercial buildings that are office space:	20%	20%
Cumulative % of residential gas equipment reaching end of life replaced with electric due to panel incentive:	15%	5540%
Cumulative % of office gas equipment reaching end of life replaced with electric due to panel incentive:	10%	320%
Number of equipment type conversions per electrical panel upgrade	2	2

Performance indicators

	2030	2050
Existing residential gas to electric HVAC conversions	3,510 existing residential gas HVAC systems replaced with electric HVAC systems.	38,66028,120 existing residential gas HVAC systems replaced with electric HVAC systems.

	2030	2050
Existing residential gas to electric water heating conversions	5,270 existing residential gas water heaters replaced with electric HVAC systems.	58,000~~42,180~~ existing residential gas water heaters replaced with electric HVAC systems.
Existing residential gas to electric clothes drying conversions	5,270 existing residential gas clothes dryers replaced with electric clothes dryers.	58,000~~42,180~~ existing residential gas clothes dryers replaced with electric clothes dryers.
Existing residential gas to electric cooking conversions	4,220 existing residential gas ranges and ovens replaced with electric ranges and ovens.	46,400~~33,740~~ existing residential gas ranges and ovens replaced with electric ranges and ovens.
Existing residential electrical panel upgrades	9,140 existing residential electrical panels upgraded.	100,530~~73,110~~ existing residential electrical panels upgraded.
Existing offices receiving gas to electric HVAC conversions	20 existing office buildings replace existing gas HVAC systems with electric HVAC systems.	220~~150~~ existing office buildings replace existing gas HVAC systems with electric HVAC systems.
Existing offices receiving gas to electric water heating conversions	40 existing office buildings replace existing gas water heaters with electric water heaters.	330~~220~~ existing office buildings replace existing gas water heaters with electric water heaters.
Existing offices receiving gas to electric cooking conversions	30 existing office buildings replace existing gas ranges and ovens with electric ranges and ovens.	270~~180~~ existing office buildings replace existing gas ranges and ovens with electric ranges and ovens.
Existing offices receiving electrical panel upgrades	50 existing office buildings electrical panels upgraded.	410~~280~~ existing office buildings electrical panels upgraded.

GHG sources

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BE-2: Electrified new construction

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-1,770,450~~890,350~~	-2,869,530~~1,533,280~~
Natural gas savings (therms)	597,320~~300,500~~	965,830~~516,050~~
GHG savings ($MTCO_2e$)		
GHG savings	3,150~~1,590~~	5,130~~2,740~~

Assumptions

	2030	2050
Cumulative % of residential construction influenced by energy design rating (EDR) reach code:	6~~3~~5%	95~~50~~%
Cumulative % of office commercial construction influenced by energy design rating (EDR) reach code:	6~~3~~5%	95~~40~~%
Cumulative % of non-office commercial construction influenced by energy design rating (EDR) reach code:	45~~20~~%	60~~35~~%
Cumulative % new nonresidential buildings that are office space:	20%	20%

Performance indicators

	2030	2050
Number of all-electric new construction residential housing units	1,080~~580~~ new construction residential housing units built all-electric.	1,300~~680~~ new construction residential housing units built all-electric.
Number of all-electric new construction nonresidential buildings	10 square feet of new construction nonresidential buildings built all-electric.	2~~1~~0 square feet of new construction nonresidential buildings built all-electric.

GHG sources

California Energy Commission. 2009. "2009 California Residential Appliance Saturation Study."

California Energy Commission. 2006. "California Commercial End-Use Survey."

Greenblatt, J. B. 2015. Modeling California policy impacts on greenhouse gas emissions. *Energy Policy, 78*. https://eta.lbl.gov/publications/modeling-california-policy-impacts.

RESIDENTIAL ENERGY EFFICIENCY

RF-1: Residential energy retrofit financing

Activity and GHG savings

This strategy is supportive of other strategies to increase energy efficiency in existing residential units. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

RF-2: Residential energy retrofit equity

Activity and GHG savings

This strategy is supportive of other strategies to increase energy efficiency in existing residential units. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

RF-3: Homeowner energy retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	67,155,660	5,383,490~~22,489,750~~
Natural gas savings (therms)	1,156,180	163,100~~698,940~~
GHG savings ($MTCO_2e$)		
GHG savings	6,800	870~~3,710~~

Assumptions

	2030	2050
Percent of existing owner-occupied homes conducting standard retrofits (not including fuel-switched homes)	25%	60%
Percent of existing owner-occupied homes retrofitting to current Title 24 standards (not including fuel-switched homes)	5%	20%
Percent of homes that are owner-occupied and single family	37%	27%
Percent of homes that are owner-occupied and multifamily	3%	2%

Performance indicators

	2030	2050
Number of owner-occupied homes retrofitted	2,780 single-family homes and 250 multi-family homes undergoing standard retrofits, and 560 single-family homes and 50 multi-family homes being upgraded to current Title 24 standards	450~~1,970~~ single-family homes and 80~~210~~ multi-family homes undergoing standard retrofits, and 150~~660~~ single-family homes and 3~~7~~0 multi-family homes being upgraded to current Title 24 standards

GHG sources

California Energy Commission. 2014. Impact Evaluation of the California Comprehensive Residential Retrofit Programs.

RF-4: Rental energy retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	78,690,780	78,054,790~~87,794,480~~
Natural gas savings (therms)	1,098,840	2,064,800~~325,550~~
GHG savings ($MTCO_2e$)		
GHG savings	6,620	10,970~~2,350~~

Assumptions

	2030	2050
Percent of existing homes conducting standard retrofits (not including fuel-switched homes)	25%	60%
Percent of existing homes retrofitting to current Title 24 standards (not including fuel-switched homes)	5%	20%
Percent of homes that are renter-occupied and single family	21%	25%
Percent of homes that are renter-occupied and multifamily	38%	46%

Performance indicators

	2030	2050
Number of renter-occupied homes retrofitted	1,760 single-family homes and 630 multi-family homes undergoing standard retrofits, and 350 single-family homes and 630 multi-family homes being upgraded to current Title 24 standards	3,910~~4,410~~ single-family homes and 2,380~~670~~ multi-family homes undergoing standard retrofits, and 1,300~~470~~ single-family homes and 2,380~~670~~ multi-family homes being upgraded to current Title 24 standards

GHG sources

California Energy Commission. 2014. Impact Evaluation of the California Comprehensive Residential Retrofit Programs.

COMMERCIAL ENERGY EFFICIENCY

CF-1: Nonresidential energy retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	44,724,600	124,791,260~~7,446,400~~
Natural gas savings (therms)	1,234,930	2,511,370~~64,800~~
GHG savings ($MTCO_2e$)		
GHG savings	7,060	13,340~~620~~

Assumptions

	2030	2050
Percent of existing businesses conducting standard retrofits (not including fuel-switched businesses)	30%	60%
Percent of existing businesses retrofitting to current Title 24 standards (not including fuel-switched businesses)	5%	20%

Performance indicators

	2030	2050
Number of businesses retrofitted	500 businesses undergoing standard retrofits, and 80 businesses upgraded to current Title 24 standards.	960~~80~~ businesses undergoing standard retrofits, and 32~~3~~0 businesses upgraded to current Title 24 standards.

GHG sources

Pacific Northwest National Laboratory. 2011. Advanced Energy Retrofit Guides: Office Buildings. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf.

Pacific Northwest National Laboratory. 2011. Advanced Energy Retrofit Guides: Retail Buildings. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf.

CF-2: Leased commercial energy efficiency

Activity and GHG savings

This strategy is supportive of other strategies to increase energy efficiency in existing commercial structures. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

CF-3: Green Business program

Activity and GHG savings

This strategy is supportive of other strategies to increase energy efficiency and other green building practices in commercial structures. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

MUNICIPAL RENEWABLE ENERGY AND ENERGY EFFICIENCY

ME-1: Municipal energy retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	318,370	1,114,310
Natural gas savings (therms)	6,830	23,900
GHG savings ($MTCO_2e$)		
GHG savings	40	130

Assumptions

	2030	2050
Percent of existing municipal buildings retrofitted	10%	35%

Performance indicators

	2030	2050
Number of retrofitted municipal buildings	3	10

GHG sources

City of San Leandro. n.d. 2015 City operations GHG inventory [data tables]

City of San Leandro. n.d. 2015 community-wide GHG inventory [data tables]

Pacific Northwest National Laboratory. 2011. Advanced Energy Retrofit Guides: Office Buildings. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf.

ME-2: Municipal renewable energy

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-1,030	-5,130
Natural gas savings (therms)	120	590
GHG savings ($MTCO_2e$)		
GHG savings	20	Less than 10

Assumptions

	2030	2050
Solar energy capacity at City facilities (kW)	2,000	5,000
Percent of City buildings with solar water heating	2%	10%

Performance indicators

	2030	2050
Number of retrofitted municipal buildings	0	3

GHG sources

City of San Leandro. n.d. 2015 City operations GHG inventory [data tables]

ME-3: Municipal energy storage

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	1,363,470	3,272,330
GHG savings ($MTCO_2e$)		
GHG savings	10	0

Assumptions

	2030	2050
Percent of buildings installing battery storage systems	25%	60%

Performance indicators

	2030	2050
Number of municipal buildings with battery systems	7	17

GHG sources

Quantification of this strategy did not rely on any additional data sources.

RENEWABLE ENERGY

RE-1: East Bay Community Energy participation

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	1,550	0

Assumptions

	2030	2050
Percent of residents enrolling in EBCE	99%	99.5%
Percent of businesses enrolling in EBCE	99%	99.5%
Percent of residents enrolling in EBCE Brilliant 100	3%	5%
Percent of businesses enrolling in EBCE Brilliant 100	3%	5%
Percent of residents enrolling in EBCE Renewable 100	2%	4%
Percent of businesses enrolling in EBCE Renewable 100	2%	4%

Performance indicators

	2030	2050
EBCE opt-out rate	1.0%	0.5%
kWh supplied by EBCE Brilliant 100	16,665,570	28,397,439
kWh supplied by EBCE Renewable100	11,066,284	22,629,154

GHG sources

East Bay Community Energy. 2019. "EBCE Tag Update" [presentation].

East Bay Community Energy. 2021. "Our Power Mix". https://ebce.org/our-power-mix/.

US Environmental Protection Agency. 2020. eGRID 2018 [data tables]. https://www.epa.gov/egrid/download-data.

RE-2: Residential owner-occupied renewable energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	320	0

Assumptions

	2030	2050
Percent of existing owner-occupied homes installing solar energy systems	15%	30%
Percent of existing owner-occupied homes with solar energy systems installing battery storage systems	20%	50%
Percent of new owner-occupied homes installing battery storage systems	25%	60%

Performance indicators

	2030	2050
Number of owner-occupied homes built before 2018 with solar panels	4,570	9,580
Number of total owner-occupied homes (existing and new) with battery energy systems	1,000	5,020

GHG sources

National Renewable Energy Laboratory. 2021. "PVWatts". https://pvwatts.nrel.gov/.

RE-3: Residential rental renewable energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	130	0

Assumptions

	2030	2050
Percent of existing renter-occupied homes installing solar energy systems	7%	15%
Percent of existing renter-occupied homes with solar energy systems installing battery storage systems	2%	5%

	2030	2050
Percent of new renter-occupied homes installing battery storage systems	25%	60%

Performance indicators

	2030	2050
Number of renter-occupied homes built before 2018 with solar panels	690	1,900
Number of total renter-occupied homes (existing and new) with battery energy systems	1,710	7,070

GHG sources

National Renewable Energy Laboratory. 2021. "PVWatts". https://pvwatts.nrel.gov/.

RE-4: Nonresidential renewable energy

GHG savings

	2030	2050
GHG savings ($MTCO_2e$)	10	0

Assumptions

	2030	2050
Percent of existing businesses installing solar energy systems	6%	15%
Percent of existing businesses with solar energy systems installing battery storage systems	15%	40%

Performance indicators

	2030	2050
Number of businesses built before 2018 with solar panels	70	220
Number of existing businesses with battery energy system	20	100

GHG sources

National Renewable Energy Laboratory. 2021. "PVWatts." https://pvwatts.nrel.gov/.

REDUCING AUTO DEPENDENCY

AD-1: Traffic calming

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	3,218,930	3,466,640
GHG savings ($MTCO_2e$)		
GHG savings	770	710

Assumptions

	2030	2050
Percent of streets with traffic calming measures	50%	50%
Percent of intersections with traffic calming measures	50%	50%

Performance indicators

	2030	2050
Percent of streets with traffic calming measures	50%	50%
Percent of intersections with traffic calming measures	50%	50%

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AD-2: Transit-Oriented Development

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	2,336,070	7,500,200
GHG savings ($MTCO_2e$)		
GHG savings	560	1,550

Assumptions

	2030	2050
Percent of new units in areas supporting transit-oriented development	70%	70%
Percent of new nonresidential square footage in areas supporting transit-oriented development	50%	50%

Performance indicators

	2030	2050
New development in TOD zones	1,160 households and 1,570 employees	1,800 households and 3,380 employees

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AD-3: Infill development

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	3,789,730	5,877,110
GHG savings ($MTCO_2e$)		
GHG savings	910	1,210

Assumptions

	2030	2050
Infill as a percent of new development	100%	100%

Performance indicators

	2030	2050
Infill as a percent of new development	100%	100%

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AD-4: Variable parking standards

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	3,432,530	7,968,510
GHG savings ($MTCO_2e$)		
GHG savings	820	1,650

Assumptions

	2030	2050
Percent reduction in parking provisions	20%	20%

Performance indicators

	2030	2050
Percent reduction in parking provisions	20%	20%

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

City of San Leandro. 2021. San Leandro Zoning Code, Section 4.08.104: Basic Requirements for Off-Street Parking and Loading.

City of San Leandro. 2021. San Leandro Zoning Code, Section 4.08.108: Off-Street Parking and Loading Spaces Required.

ACTIVE AND ALTERNATIVE TRANSPORTATION

AT-1: Transportation Demand Management

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	487,570	14,626,980
GHG savings ($MTCO_2e$)		
GHG savings	120	3,010

Assumptions

	2030	2050
Percent of existing employers participating in TDM	5%	30%
Average trip reduction from voluntary TDM participation	8%	40%

Performance indicators

	2030	2050
Existing businesses participating in TDM efforts	90	510

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AT-2: Bicycle infrastructure

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	3,177,610	3,974,640
GHG savings ($MTCO_2e$)		
GHG savings	760	820

Assumptions

	2030	2050
Additional miles of bike lanes	35	41.2
Average round-trip length (miles)	8	8

Performance indicators

	2030	2050
Total miles of bike lanes	78.4	84.6

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

City of San Leandro. 2018. *City of San Leandro Bicycle & Pedestrian Master Plan*. https://www.sanleandro.org/civicax/filebank/blobdload.aspx?blobid=28158.

AT-3: Active transportation and micro-mobility

Activity and GHG savings

This strategy is designed to increase active transportation and micro-mobility options in San Leandro. There are no activity or GHG emission savings associated with it. GHG reductions from active transportation are assessed as a part of other measures. GHG reductions from micro-mobility remain uncertain at this time due to lack of information.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

AT-4: Walkability

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	1,635,700	2,564,560
GHG savings ($MTCO_2e$)		
GHG savings	400	530

Assumptions

	2030	2050
Infill as a percent of new development	100%	100%

Performance indicators

	2030	2050
Infill as a percent of new development	100%	100%

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AT-5: Public transit

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	15,625,370	42,716,910
GHG savings ($MTCO_2e$)		
GHG savings	3,560	8,800

Assumptions

	2030	2050
Bus commute share	5%	10%
Percent increase in BART ridership over baseline projection for that year (attributable to the policy)	2%	5%

Performance indicators

	2030	2050
Bus commute share	5%	10%
Average BART daily ridership in San Leandro	128,290	141,020

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

San Francisco Bay Area Rapid Transit District. 2021. "Ridership Reports". https://www.bart.gov/about/reports/ridership.

AT-6: BART shuttles

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	15,390	13,820
GHG savings ($MTCO_2e$)		
GHG savings	Less than 10	Less than 10

Assumptions

	2030	2050
Percent increase in shuttle ridership	1%	1%

Performance indicators

	2030	2050
Shuttle ridership	200,230	200,230

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AT-7: Car sharing

Activity and GHG savings

	2030	2050
Activity savings		
Trip savings (VMT)	3,176,010	3,400,690

	2030	2050
Activity savings GHG savings ($MTCO_2e$)		
GHG savings	760	700

Assumptions

	2030	2050
Car share rate (cars shared per X population)	1500	1500

Performance indicators

	2030	2050
Number of shared cars	70	70

GHG sources

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures. http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf.

AT-8: Autonomous vehicles

Activity and GHG savings

This strategy is designed to reduce GHG emissions associated from autonomous vehicles. As these GHG reductions remain uncertain at this time due to a lack of information, there are no activity or GHG emission savings from this measure.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

TRANSPORTATION ELECTRIFICATION AND LOW-CARBON FUELS

TE-1: Electric vehicle adoption

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-4,248,120~~226,960~~	46,222,190-~~6,083,520~~
GHG savings ($MTCO_2e$)		
GHG savings	4,0~~6~~40	43,000~~5,660~~

Assumptions

	2030	2050
Target % Passenger VMT from electric vehicles	7%	~~4~~10%

Performance indicators

	2030	2050
EV registration	7,180	43,930~~10,980~~

GHG sources

California Department of Motor Vehicles. 2019. Fuel Type by City as of 10/1/2018 [data table].

US Department of Energy. 2021. "Alternative Fuels Data Center: Data Sources and Assumptions for the Electricity Sources and Emissions Tool". https://afdc.energy.gov/vehicles/electric_emissions_sources.html.

TE-2: EV charging stations

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-260,310	-456,910
GHG savings ($MTCO_2e$)		
GHG savings	250	430

Assumptions

	2030	2050
Parking spaces per business:	9	9

	2030	2050
Cumulative target % of new workplace parking to have EV charger installed:	13%	17%
Cumulative % commercial buildings that are office space with parking:	40%	40%
Cumulative target % of existing workplace parking to have EV charger installed:	10%	15%
Cumulative target additional public parking spaces with EV charging:	30	60
Cumulative percent of passenger EV purchases replacing gasoline vehicle:	100%	100%
Cumulative percent of passenger EV purchases replacing diesel vehicle:	0%	0%

Performance indicators

	2030	2050
Additional workplace charging ports installed	300	580
New EV Drivers	260	510

GHG sources

Quantification of this strategy did not rely on any additional data sources.

TE-3: Alternative commercial fuels

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-1,448,340	-34,009,410~~6,801,880~~
GHG savings ($MTCO_2e$)		
GHG savings	5,040	39,940~~14,960~~

Assumptions

	2030	2050
Target % total commercial natural gas VMT replaced by biomethane:	10~~.00~~%	25~~.00~~%
Target % total commercial diesel VMT replaced by biomethane:	10~~.00~~%	25~~.00~~%
Target % total commercial diesel VMT replaced by electricity	1~~.00~~%	25~~5.00~~%

	2030	2050
Target % total commercial gasoline VMT replaced by electricity	1.00%	25.00%

Performance indicators

Due to challenges tracking this information, given currently available sources, there are no performance indicators for this measure.

GHG sources

ICLEI Local Governments for Sustainability USA. 2019. US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. http://www.icleiusa.org/tools/ghgprotocol/community-protocol.

US Department of Energy. 2021. "Alternative Fuels Data Center: Fuel Conversion Factors to Gasoline Gallon Equivalents". https://epact.energy.gov/fuel-conversion-factors.

TE-4: Municipal fleet fuel reduction

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-661,730	-598,820
Gasoline savings (gallons)	12,320	58,1003,950
Diesel savings (gallons)	990	9,8903,950
GHG savings ($MTCO_2e$)		
GHG savings	130	680390

Assumptions

	2030	2050
Percent of light-duty vehicles replaced by EVs	20%	850%
Percent of heavy-duty vehicles replaced by EVs	5%	520%

Performance indicators

	2030	2050
City fleet gasoline use (gallons)	55,140	47,520
City fleet diesel use (gallons)	15,540	13,520
City fleet electricity use (kWh)	661,730	598,820

GHG sources

City of San Leandro. n.d. 2015 City operations GHG inventory [data tables]

ICLEI Local Governments for Sustainability USA. 2019. US Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. http://www.icleiusa.org/tools/ghgprotocol/community-protocol.

TE-5: EV financing

Activity and GHG savings

This strategy is supportive of other strategies to increase vehicle electrification and the adoption of other low- or no-carbon fuels. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

TE-6: Electric taxis and TNCs

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	-6,576~~43~~,295~~3~~0	-6,800,180~~10,691,770~~
GHG savings ($MTCO_2e$)		
GHG savings	6,2~~9~~60	6,330~~9,950~~

Assumptions

	2030	2050
Target % of total community TNC VMT from electric:	50%	90%

Performance indicators

Due to challenges tracking this information, given currently available sources, there are no performance indicators for this measure.

GHG sources

US Department of Energy, 2019. "www.fueleconomy.gov."

California Air Resources Board, 2018. "EMFAC2017 Web Database."

San Francisco County Transportation Authority, 2017. "TNCs Today: A Profile of San Francisco Transportation Network Company Activity."

WASTE MANAGEMENT

WM-1: Increased curbside recycling

Activity and GHG savings

	2030	2050
Activity savings		
Solid waste (tons)	10,270	14,010
GHG savings ($MTCO_2e$)		
GHG savings	7,980	10,880

Assumptions

	2030	2050
Target diversion rate	85%	90%

Performance indicators

	2030	2050
Total tons of recyclables recovered	61,870	69,950

GHG sources

California Air Resources Board. 2011. "Local Government Operations Protocol for Greenhouse Gas Assessments". https://ww3.arb.ca.gov/cc/protocols/localgov/localgov.htm.

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recovery and Recycling. 2020. *2018 Disposal-Facility-Based Characterization of Solid Waste in California*. https://www2.calrecycle.ca.gov/Publications/Details/1666.

StopWaste. 2020. *2020 Recycling Plan Update*. http://www.acgov.org/board/bos_calendar/documents/DocsAgendaReg_10_5_20/GENERAL%20ADMINISTRATION/Regular%20Calendar/Beyond_75_stopwaste_10_5_20.pdf.

WM-2: Curbside composting

Activity and GHG savings

	2030	2050
Activity savings		
Solid waste (tons)	6,840	9,300
GHG savings ($MTCO_2e$)		
GHG savings	2,670	3,640

Assumptions

	2030	2050
Residential composting participation rate	90%	95%
Nonresidential composting participation rate	80%	90%

Performance indicators

	2030	2050
Composting participation levels	33,130 households and 1,570 businesses	35,830 households and 1,880 businesses

GHG sources

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recovery and Recycling. 2020. *2018 Disposal-Facility-Based Characterization of Solid Waste in California.* https://www2.calrecycle.ca.gov/Publications/Details/1666.

Richardson, T. 2019. City of San Leandro. Personal communication to Mok, H. F. November 15.

WM-3: Recycling expansion

Activity and GHG savings

This strategy is supportive of other strategies to increase recycling efforts in San Leandro. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

WASTE REDUCTION AND REUSE

WR-1: Waste minimization

Activity and GHG savings

	2030	2050
Activity savings		
Solid waste (tons)	17,330	45,880
GHG savings ($MTCO_2e$)		
GHG savings	2,240	6,300

Assumptions

	2030	2050
Decrease in non-organic and non-recyclable waste tonnage	20%	50%

Performance indicators

	2030	2050
Decrease in non-organic and non-recyclable waste tonnage sent to landfills	17,330	45,880

GHG sources

California Air Resources Board. 2011. "Local Government Operations Protocol for Greenhouse Gas Assessments'. https://ww3.arb.ca.gov/cc/protocols/localgov/localgov.htm.

California Air Resources Board. 2011. Landfill Methane Emissions Tool [data table]. https://ww2.arb.ca.gov/resources/documents/landfill-methane-emissions-tool.

California Department of Resources Recovery and Recycling. 2020. *2018 Disposal-Facility-Based Characterization of Solid Waste in California.* https://www2.calrecycle.ca.gov/Publications/Details/1666.

WR-2: Construction and Demolition waste

Activity and GHG savings

	2030	2050
Activity savings		
Solid waste (tons)	1,040	1,850
GHG savings ($MTCO_2e$)		
GHG savings	410	730

Assumptions

	2030	2050
Reduction in wood, lumber, and pallet generation	15%	25%

Performance indicators

	2030	2050
Decrease in construction and demolition materials produced as waste (tons)	1,040	1,850

GHG sources

California Air Resources Board. 2011. "Local Government Operations Protocol for Greenhouse Gas Assessments". https://ww3.arb.ca.gov/cc/protocols/localgov/localgov.htm.

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California Department of Resources Recovery and Recycling. 2020. *2018 Disposal-Facility-Based Characterization of Solid Waste in California*. https://www2.calrecycle.ca.gov/Publications/Details/1666

WR-3: Commercial food waste reduction

Activity and GHG savings

	2030	2050
Activity savings		
Solid waste (tons)	670	1,070
GHG savings ($MTCO_2e$)		
GHG savings	340	540

Assumptions

	2030	2050
Reduction in commercial food waste	10%	15%

Performance indicators

	2030	2050
Reduction in food waste	670	1,070

GHG sources

California Air Resources Board. 2011. "Local Government Operations Protocol for Greenhouse Gas Assessments'. https://ww3.arb.ca.gov/cc/protocols/localgov/localgov.htm.

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California Department of Resources Recovery and Recycling. 2020. 2018 Disposal-Facility-Based Characterization of Solid Waste in California. https://www2.calrecycle.ca.gov/Publications/Details/1666

WR-4: Industrial waste reduction

Activity and GHG savings

This strategy is supportive of other strategies to reduce waste generation in San Leandro. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

WR-5: Styrofoam and single-use plastics reduction

Activity and GHG savings

This strategy is supportive of other strategies to reduce waste generation in San Leandro. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

WR-6: Local compost

Activity and GHG savings

This strategy is supportive of other strategies to reduce waste generation in San Leandro. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

WATER EFFICIENCY

WE-1: Reclaimed water

Activity and GHG savings

This strategy is intended to increase the availability of reclaimed water in San Leandro. Due to the energy needs of reclaimed water and uncertainty around potential increases in capacity, there are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

WE-2: Greywater retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	44,220	179,580
Water savings (millions of gallons)	10	50
GHG savings ($MTCO_2e$)		
GHG savings	10	40

Assumptions

	2030	2050
Percent of existing homes with greywater systems	5%	20%
Percent of existing businesses with greywater systems	3%	15%

Performance indicators

	2030	2050
Number of greywater system installations	1,760 homes and 60 businesses with greywater systems installed.	7,030 homes and 280 businesses with greywater systems installed.

GHG sources

California Department of Water Resources and State Water Resources Control Board. 2018. *Making Water Conservation a California Way of Life*. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf.

US Environmental Protection Agency. 2009. *Water Efficiency in the Commercial and Institutional Sector*. https://www.epa.gov/sites/production/files/2017-03/documents/ws-commercial-ci-whitepaper.pdf.

WE-3: Water-efficient retrofits

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	236,880	481,910
Water savings (millions of gallons)	70	140
GHG savings ($MTCO_2e$)		
GHG savings	30	50

Assumptions

	2030	2050
Percent of existing homes retrofitting water fixtures	50%	95%
Percent of existing businesses retrofitting water fixtures	40%	95%

Performance indicators

	2030	2050
Number of water efficiency retrofits	16,730 existing homes and 680 existing businesses with water efficiency retrofits.	31,790 existing homes and 1,620 existing businesses with water efficiency retrofits.

GHG sources

California Department of Water Resources and State Water Resources Control Board. 2013. *California Water Plan Update 2013, Volume 3 – Resource Management Strategies*. https://water.ca.gov/Programs/California-Water-Plan/Previous-Updates.

California Department of Water Resources and State Water Resources Control Board. 2018. *Making Water Conservation a California Way of Life*. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf.

WE-4: New greywater installations

Activity and GHG savings

	2030	2050
Activity savings		
Electricity savings (kWh)	48,880	97,680
Water savings (millions of gallons)	10	30
GHG savings ($MTCO_2e$)		
GHG savings	10	20

Assumptions

	2030	2050
Percent of new construction with greywater systems	20%	30%

Performance indicators

	2030	2050
Number of new homes with greywater systems	330	770
Number of new businesses with greywater systems	20	70

GHG sources

California Department of Water Resources and State Water Resources Control Board. 2018. *Making Water Conservation a California Way of Life*. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf.

US Environmental Protection Agency. 2009. *Water Efficiency in the Commercial and Institutional Sector*. https://www.epa.gov/sites/production/files/2017-03/documents/ws-commercial-ci-whitepaper.pdf.

COMMUNITY CONSUMPTION

CC-1: Environmentally Preferred Purchasing

Activity and GHG savings

This strategy is supportive of efforts to purchase environmentally responsible products and services to reduce consumption-based emissions. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

CC-2: Local goods and services

Activity and GHG savings

This strategy is supportive of efforts to purchase environmentally responsible products and services to reduce consumption-based emissions. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

CC-3: Low-carbon building materials

Activity and GHG savings

This strategy is supportive of efforts to purchase environmentally responsible products to reduce consumption-based emissions. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

CC-4: Responsible carbon offsets

Activity and GHG savings

This strategy is supportive of efforts to offset remaining GHG emissions through socially and environmentally responsible practices. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

EQUITY AND JUST TRANSITION

EJ-1: Green job training

Activity and GHG savings

This strategy is supportive of efforts to establish a just transition through equitable economic development. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

EJ-2: Workforce equity

Activity and GHG savings

This strategy is supportive of efforts to establish a just transition through equitable economic development. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

EJ-3: Just transition

Activity and GHG savings

This strategy is supportive of efforts to establish a just transition through equitable economic development. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive strategy. There is no assumptions or performance indicators.

GHG sources

This is a supportive strategy. There are no sources used.

~~**EJ-1: Environmentally Preferred Purchasing**~~

~~Activity and GHG savings~~

~~This strategy is supportive of efforts to purchase environmentally responsible products and services. There are no activity or GHG emission savings associated with it.~~

~~**Assumptions and performance indicators**~~

~~This is a supportive measure. There are no assumptions or performance indicators.~~

~~**EJ-2: Local goods and services**~~

~~Activity and GHG savings~~

~~This strategy is supportive of efforts to purchase environmentally responsible products and services. There are no activity or GHG emission savings associated with it.~~

~~Assumptions and performance indicators~~

~~This is a supportive measure. There are no assumptions or performance indicators.~~

~~EJ-3: Low-carbon building materials~~

~~Activity and GHG savings~~

~~This strategy is supportive of efforts to purchase environmentally responsible products. There are no activity or GHG emission savings associated with it.~~

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

EJ-4: Green job training

Activity and GHG savings

This strategy is supportive of efforts to establish a just transition through equitable economic development. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

EJ-5: Workforce equity

Activity and GHG savings

This strategy is supportive of efforts to establish a just transition through equitable economic development. There are no activity or GHG emission savings associated with it.

Assumptions and performance indicators

This is a supportive measure. There are no assumptions or performance indicators.

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D. Endnotes

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