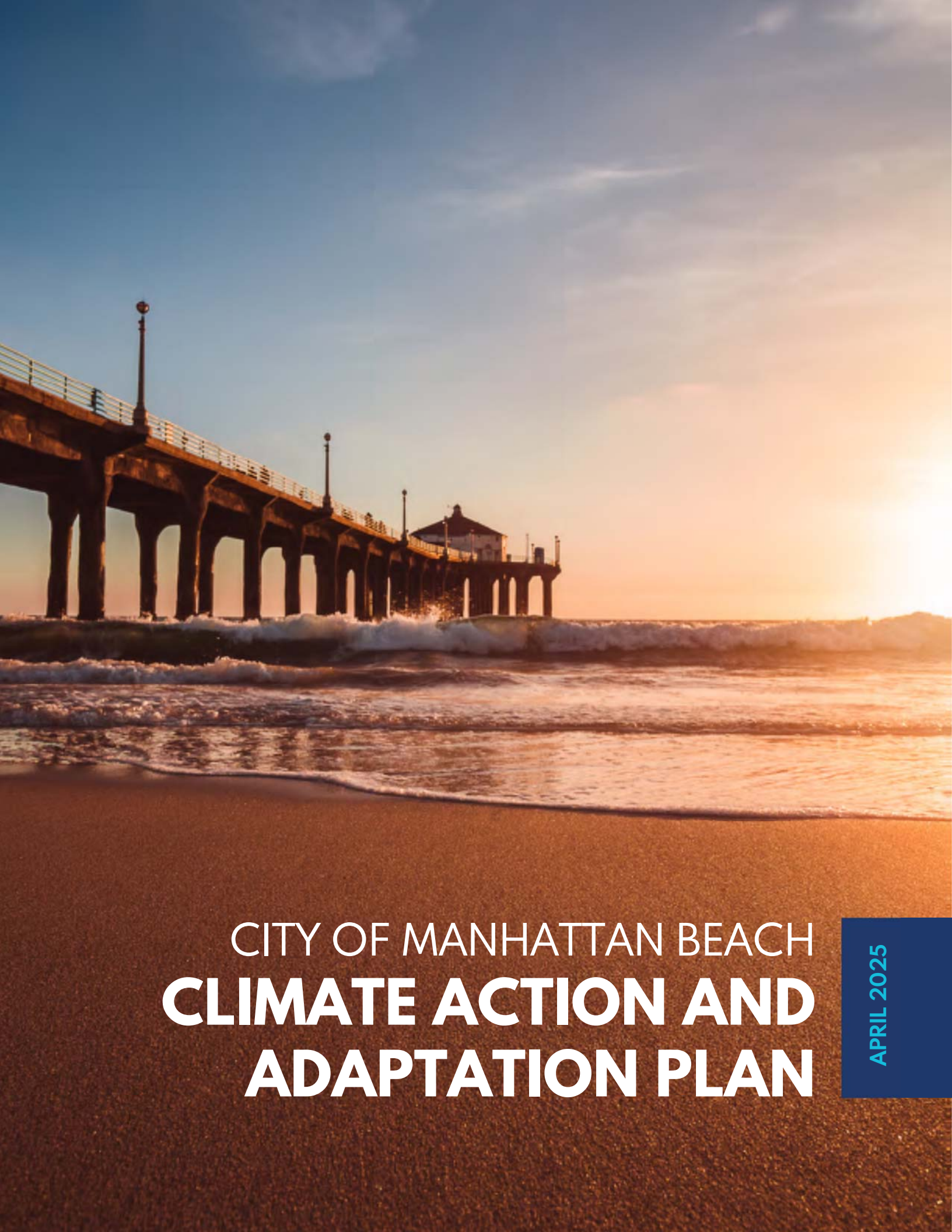

CITY OF MANHATTAN BEACH

CLIMATE ACTION AND ADAPTATION PLAN

APRIL 2025

CONTENTS

Appendices

GLOSSARY

TERMS, ACRONYMS, AND ABBREVIATIONS			
AB 32	Assembly Bill 32 Global Warming Solutions Act of 2006	**NOAA**	National Oceanic and Atmospheric Administration
AB 1279	Assembly Bill 1279 Carbon Neutrality	**N_2O**	nitrous oxide
AB 1493	Assembly Bill 1493 Clean Car Standards - Pavley	**OEHHA**	Office of Environmental Health Hazard Assessment
ACC	Advanced Clean Cars	**OPR**	California's Office of Planning and Research
BAU	business-as-usual	**PHEV**	Plug-in hybrid electric vehicles
BIPOC	Black, Indigenous, and People of Color	**PFCS**	Perfluorocarbons
BCT	Beach Cities Transit	**PM**	fine particulate matter
CAAP	Climate Action and Adaptation Plan	**RNG**	renewable natural gas
CALGREEN	California Green Building Standards Code	**RPS**	Renewables Portfolio Standard
CARB	California Air Resources Board	**SB 32**	Senate Bill 32 California Global Warming Solutions Act of 2006 –2030 Emissions Limit
CFCS	chlorofluorocarbons	**SB 350**	Senate Bill 350 Clean Energy and Pollution Reduction Act
CPA	Clean Power Alliance of Southern California	**SB 535**	Senate Bill 535 California Climate Investments in Disadvantaged Communities
CO_2	carbon dioxide	**SB 375**	Senate Bill 375 Sustainable Communities and Climate Protection Act
CH_4	methane	**SB 379 (2015)**	Senate Bill 379 Land use: general plan: safety element: climate adaptation
EBS	Engineered Bio Slurry	**SB 379 (2022)**	Senate Bill 379 Solar Access Act: Residential solar energy systems: permitting
ELP	Energy Leader Partnership	**SB 1020**	Senate Bill 1020 Clean Energy, Jobs, and Affordability Act of 2022
EV	Electric vehicle	**SB 1383**	Senate Bill 1383 California's Short-Lived Climate Pollutant Reduction Law of 2016
GHG	Greenhouse gas	**SBCCOG**	South Bay Cities Council of Government
GPCD	gallons per capita per day	**SCAG**	Southern California Association of Governments

TERMS, ACRONYMS, AND ABBREVIATIONS			
HCD	CA State Department of Housing and Community Development	**SCE**	Southern California Edison
HFCS	hydrofluorocarbons	**SCG**	Southern California Gas Company
IPCC	Intergovernmental Panel on Climate Change	**SF_6**	sulfur hexafluoride
LADOT	Los Angeles Department of Transportation	**SLR VA**	Sea Level Rise Vulnerability Assessment
LCP	Manhattan Beach Local Coastal Program	**SOLAR PV**	solar photovoltaic
LCFS	Low-Carbon Fuel Standard	**SOV**	single-occupant vehicle
LHMP	Local Hazards Mitigation Plan	**TDM**	Transportation Demand Management
MAAS	Mobility-as-a-Service	**TIA**	Transportation Impact Analysis
MANUAL	Beach Cities Living Streets Design Manual	**UWMP**	Urban Water Management Plan
MTA	Los Angeles County Metro	**VMT**	vehicle miles traveled
$MTCO_2E$	Metric tons of carbon dioxide equivalent	**WBMWD**	West Basin Municipal Water District
MWB	Metropolitan Water District of Southern California	**WMP**	Manhattan Beach Water Master Plan
MWELO	Model Water Efficient Landscape Ordinance	**ZEV**	Zero-emission vehicles
NEM	Net Energy Metering		

ACKNOWLEDGEMENTS

The City of Manhattan Beach's Environmental Sustainability Division strives to create a healthy, sustainable, and resilient community while furthering the City's long history of environmental leadership, policy, and stewardship. In developing the Climate Ready Manhattan Beach: Climate Action and Adaptation Plan (CAAP), we would like to thank the Manhattan Beach community and stakeholders who took the time to participate in the outreach process to share their priorities and experiences, and also thank the Manhattan Beach City Council, Planning Commission, Community Development Department, Public Works Department, and other City staff who provided additional feedback, guidance, and content throughout the plan development process. These contributions were invaluable to the creation of this CAAP and will continue to be instrumental throughout its implementation.

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Commissions and Departments

Planning Commission
Parking and Public Improvements Commission
Environmental Sustainability
Community Development
Parks and Recreation
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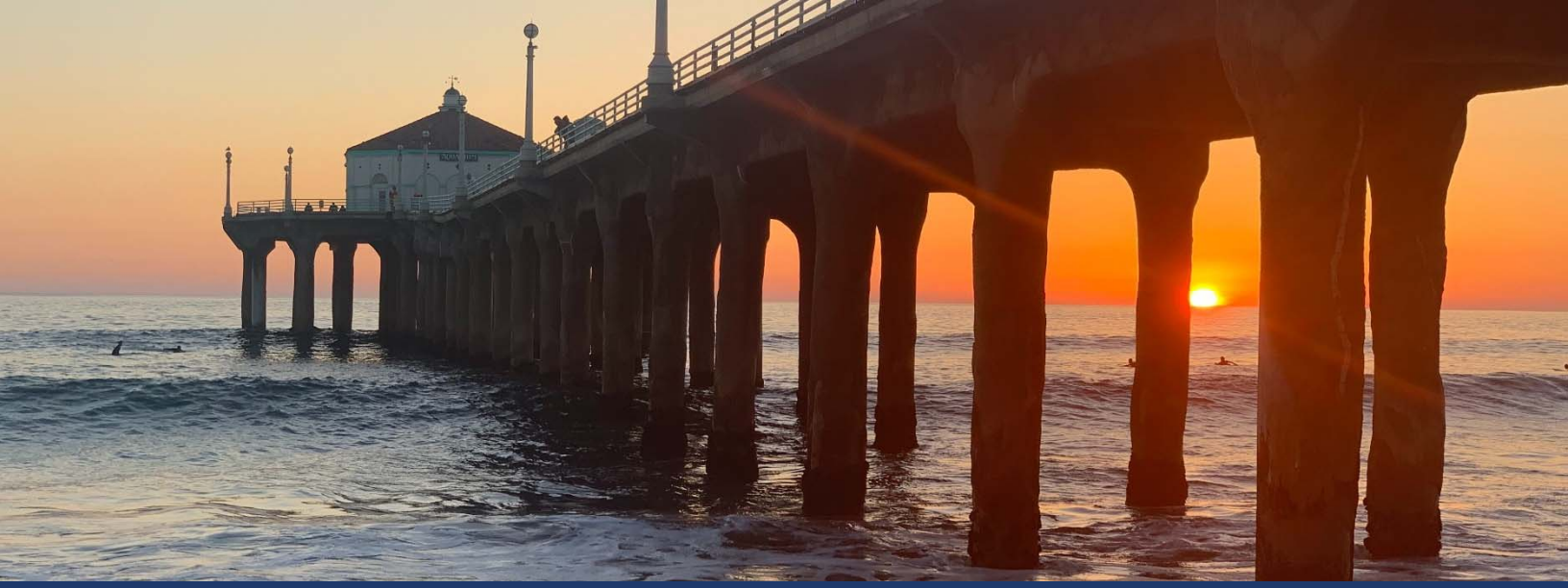


CHAPTER 1
Introduction and Background

Given the scientific consensus that greenhouse gas (GHG) emissions are contributing to global climate change and the GHG reduction policies established by the State of California, the City of Manhattan Beach (City) is joining an increasing number of California local governments committed to addressing climate change at the local level. The City recognizes the risk that climate change poses to its residents, business owners, and visitors, and is acting to reduce the GHG emissions from both its government operations and the community at-large through the strategies set forth in this Climate Action and Adaptation Plan (CAAP), which represents the second phase of the Climate Ready Manhattan Beach project, the first phase of which began in 2020 and included the City's *Sea Level Rise Risk, Hazards, and Vulnerability Assessment* (May 2021), *Sea Level Rise Adaptation Plan* (September, 2021), and associated policy updates to the City's Local Coastal Program (LCP) Coastal Hazards Chapter, which was approved by the Coastal Commission in 2024.

Although state and regional policies and programs are being implemented to reduce GHG emissions, local action is also needed to ensure that the City of Manhattan Beach is doing its part to mitigate climate change and adapt to its current and future effects. The CAAP takes a commonsense approach to reducing GHG emissions in the City of Manhattan Beach, with policies and cost-effective programs that the City itself, as well as its residents

and businesses, can implement to reduce GHG emissions associated with energy consumption, transportation, water use, and solid and organic waste sent to local landfills.

Purpose and Vision

The CAAP has two major objectives: to reduce the City of Manhattan Beach's community-wide GHG emissions and to increase the resilience of the community to the anticipated impacts of climate change. By implementing the CAAP, the City intends to align with the State of California's GHG targets and to be better prepared for rising temperatures, extended droughts, wildfire seasons, and sea level rise. Manhattan Beach's vision is to be "Climate Positive" – a force for good in the protracted battle against climate change and an example to the region that taking action on climate is a positive action that can improve community health and well-being, reduce costs of living, provide business opportunities, and improve the environment.

Climate Positive Manhattan Beach

Climate Positive Manhattan Beach reflects the City's vision for its residents, businesses, and municipal government to have an overall net positive impact on climate change in the coming decades. This will be accomplished by achieving net zero community GHG emissions by the year 2045 and by investing in the technologies, ideas, and innovations that hold promise for a thriving decarbonized economy and a community resilient to a changing climate.

This CAAP outlines goals, strategies, and actions for reducing emissions and for increasing community resilience to climate change. It is designed to ensure that Manhattan Beach does its part to contribute to the goals of California's Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32), and its successor legislation Senate Bill (SB) 32, while remaining consistent with the City's General Plan vision for future growth. The reduction of GHG emissions can ultimately establish the City as a leader in addressing the fundamental causes of climate change within its own community. It is also designed to help the City comply with the requirements of Senate Bill 379[1], providing a list of recommended policies to address climate change in the next update to the City's Safety Element of the General Plan and current Draft Local Hazard Mitigation Plan.

Reducing GHG Emissions

AB 32 directs the State to reduce statewide GHG emissions to 1990 levels by 2020, while SB 32 deepens that commitment to 40 percent below 1990 levels by 2030. To achieve these reductions, the California Air Resources Board (CARB) and the State Office of Planning and Research (OPR) recommend that local governments develop community-wide targets that are consistent with these statewide targets. This CAAP sets a 2030 community-wide GHG target for the City and outlines the strategies and actions the City can take to reduce GHG emissions and track progress towards reaching that target.

In developing this CAAP, the City of Manhattan Beach considered many potential GHG-reduction strategies and actions. Best-suited measures were chosen primarily based on community support, their ability to reduce GHG

1 Land use; general plan; safety element (2015)

emissions, and cost-benefit characteristics, with additional considerations for funding availability and feasibility of implementation. The City is in the early stages of shifting toward a low-carbon economy, building on previous programs and policies for emissions reductions, including the preparation of the 2010 municipal Climate Action Plan that pledged to reduce emissions by 15 percent, signing onto the Global Covenant of Mayors for Climate & Energy in 2016 with goals for further reducing emissions and addressing climate vulnerabilities, and increasing renewable energy use to 100 percent for all City facilities in 2021. This CAAP deepens these investments, with high priority given to strategies and actions that support local economic development by creating new jobs, supporting both existing and new local green businesses, reducing energy costs, increasing energy security, and reducing traffic congestion. Additional considerations included public health impacts, air quality impacts, and quality of life impacts.

The GHG reduction measures in the CAAP address energy consumption and generation, transportation, land use, solid waste disposal, and water use. For each GHG reduction measure, there are performance goals, strategies, and specific actions for reducing emissions. The CAAP also identifies local co-benefits such as improved air quality, cost savings, social equity, and community health, as well as promotion of sustainable economics and increased resilience to the impacts of climate change. Guidance for implementation, monitoring, and future updates is also provided.

Adapting to Climate Change

The City of Manhattan Beach faces a range of challenges related to climate change impacts that include more extreme heat events, sea level rise, flooding, worsening air quality, and drought. Climate science demonstrates how hazards will worsen over time. As outlined in this plan, the City's goal of reducing GHG emissions will help mitigate the worst effects of climate change, but adaptation measures are also needed for Manhattan Beach to be a more resilient and climate-positive community. Effective adaptation requires changes in systems and specific actions that will help our neighborhoods, natural systems, and infrastructure withstand the effects of climate change. This CAAP identifies the vulnerabilities faced by the community, as well as adaptation actions that will help protect valuable community resources and vulnerable population groups.

Plan Organization

The CAAP is organized into the following chapters, as described below:

- **Chapter 1: Introduction and Background.** This chapter provides an overview of the document, the purpose and scope of the CAAP, the basic science behind climate change, and importance of considering equity when taking action. In addition, Chapter 1 provides a brief explanation of potential impacts of climate change in the City of Manhattan Beach, the community benefits of taking action, and a discussion of the State and local actions to reduce GHG emissions.
- **Chapter 2: Climate Positive Goals.** This chapter describes the goals of the Climate Action and Adaptation Plan, reflective of community concerns and aspirations, and informed by the adopted goals and policies in the City's General Plan.
- **Chapter 3: Understanding the Community's Greenhouse Gas Emissions.** This chapter presents a detailed analysis of the City's community-wide GHG emissions since the year 2005, a forecast of emissions out to 2050, and the formulation of the City's GHG target for 2030, in alignment with State policy.

- **Chapter 4: Understanding Local Vulnerabilities to Climate Change.** This chapter presents an overview of the impacts that Manhattan Beach is expected to experience due to projected changes in the climate, and what the City can do to begin preparing for them. It describes expected local impacts and vulnerabilities, and potential adaptation planning strategies.
- **Chapter 5: Strategies and Actions to Reduce Emissions.** Achieving the community GHG reduction targets will require taking action at the local level regarding energy use, transportation and land use, solid waste diversion, and water consumption. Chapter 5 addresses each of these sectors, summarizing their contribution to total City-wide emissions and describing the strategies and actions that will be implemented to reduce emissions from each category over time.
- **Chapter 6: Strategies and Actions to Increase Resilience.** This chapter presents strategies and actions for the City to build climate resilience within the community, with a focus on increasing the City's capacity to adapt to climate hazards and vulnerabilities identified in Chapter 4. It also outlines actions that individuals can take to increase preparedness and knowledge of expected impacts.
- **Chapter 7: Implementation and Monitoring.** This chapter outlines recommended steps for implementing the GHG reduction strategies described in Chapter 5, and for monitoring the progress of implementation. It assigns implementation and monitoring responsibility to specific City departments and presents a schedule for implementation. Appendix C also discusses potential funding sources, and partnerships the City may enter into to leverage existing work and local resources for each GHG reduction measure discussed in Chapter 5.

A History of Taking Action

The City of Manhattan Beach has a rich history of environmental leadership, with advancements over the past 15 years. With the creation of the CAAP, the City establishes specific goals to continue setting a precedent for best practices in sustainability. In collaboration with general public, community groups, utilities, businesses, academic institutions, State agencies, and other municipalities, the City has focused on: climate action and adaptation, water conservation, waste minimization, green building, and civic engagement. Below is a general overview of efforts made by the City between 2007-2023. To date, the City has received certifications and sustainability awards from the Institute of Local Governments, Global Covenant of Mayors for Climate & Energy, Solsmart, American Public Works Association, the Blue City Network and has achieved both silver and gold level status in the South Bay Cities Council of Government Energy Leader Program for achievements in beach health, water quality, greenhouse gas emissions reductions, climate action, public outreach, and energy savings. Additionally, the City has reported its environmental data to CDP since 2018. CDP, formerly known as the Carbon Disclosure Project, is a global environmental disclosure program that helps cities and companies identify gaps, benchmark performance, and find areas of opportunity for sustainable development and climate action. CDP provides an annual score, from A (best) to D- (worst), that reflects the level of transparency, action, and progress a city is taking towards reducing GHG emissions. In its first year of reporting, the City received a D score and has since improved its score to B in 2023, reflecting its progress and commitment to climate action.

Green Building

- In 2008, the City adopted new construction codes to enforce sustainability practices in new homes, which focused on energy efficient appliances, environmentally-friendly products, and readiness for renewable energy infrastructure.

- The City regularly conducts energy audits of City facilities to identify energy efficiency opportunities and upgrades.
- In 2020-2021 the City retrofitted 942 City-owned streetlight fixtures to LEDs to improve energy efficiency.

Reducing GHG Emissions

- In 2008 the City Council adopted an ordinance requiring taxis to phase in new clean air vehicles by 2010.
- The City has transitioned 16 gas-powered vehicles in the City's fleet to electric alternatives.
- The City has further supported electric vehicle infrastructure by installing 28 public electric vehicle charging stations throughout the City.
- The City joined the Global Covenant of Mayors for Climate & Energy and committed to monitoring and reducing greenhouse gas emissions and monitoring climate risks.
- The City conducts municipal and community greenhouse gas emissions inventory updates every 3-5 years.
- The City is working on a transition plan for the remaining internal combustion engine City vehicle fleet in partnership with Clean Power Alliance. This also complies with State Advanced Clean Fleets Regulations.

Water Conservation

- The City has replaced surface public parking lots with permeable surfaces.
- The City has installed drip irrigation systems for its public landscaping areas.
- The City's water conservation ordinance was passed in 2009 and remains in effect.
- The California Green Business program has certified 100 Manhattan Beach businesses as of 2023, an estimated savings of 8 million gallons of water, eliminating 1,876,000 lbs. of CO2, and saving 1.4 million kwh of energy.
- The City prioritizes drought-tolerant and climate-appropriate landscaping for plantings communitywide. Rebates from City water suppliers encourage the community to do this as well.

Waste Minimization

- The City promotes responsible waste management and recycling with battery collection, household hazardous waste collection, free bulky-item pickup, mixed recycling and organic collection at no additional cost to single-family and multi-family residents, and a medication drop off box.
- Plastic policies have banned polystyrene food service ware, plastic bags, foam food service materials, single-use plastic straws, stirrers, and utensils.
- The City has implemented food waste recycling programs in partnership with Waste Management, with services to support residential and commercial streams that help reduce organic waste and increase recovery. The Curbside Organics Program collects residential food scraps, yard waste, and soiled paper for composting, while the Food Waste Recycling Program collects organic waste from businesses to be converted to renewable energy for electricity use.
- The California Green Business program also recognizes businesses for their efforts in waste reduction and has certified 100 businesses in Manhattan Beach that have contributed to 2,626,000 lbs. of solid waste diversion as of 2023.

- The Green Purchasing Program is in place to promote City purchasing of environmentally friendly materials that are made of durable materials, contain recycled content, use fewer chemicals, reduce GHG Emissions, and/or use wood from sustainably harvested forests.

Climate Action Planning

- The City first created a Municipal Climate Action Plan in 2010, pledging to cut carbon in City facilities to 15 percent below 2005 levels by 2020. The plan was modified in 2015.
- Manhattan Beach joined a community choice aggregation, Clean Power Alliance, in 2017, with all community members receiving 100 percent renewable energy by 2021.
- In 2020 the City launched Climate Ready Manhattan Beach, a climate resiliency program that includes sea level rise virtual reality videos, modeling scenarios, and municipal reports and plans for climate action.
- The City initiated a Beach Dune Restoration Project to enhance Manhattan Beach's dunes to restore native ecosystems and improve coastal resiliency.
- In 2024 Manhattan Beach updated their Local Coastal Program (LCP), adopting a new Coastal Hazards Chapter and obtaining certification and commendation from the Coastal Commission. (The Commission commended Manhattan Beach for being one of the first jurisdictions to adopt a Coastal Hazards chapter in accordance with State guidance).

Public Outreach and Community Groups

- Since 2007, in partnerships with other entities, the City has participated in several hundred meetings to educate the community on environmental issues, including climate change.
- The City has convened three Environmental/Sustainability Task Forces since 2011, which have allowed environmental experts in the community to contribute and shape policies.
- In 2024 The City hosted a Sustainability Forum, giving the community the opportunity to identify and prioritize sustainability efforts.

Community Input

The City conducted a series of stakeholder engagement meetings and public workshops to inform development of the (CAAP). Engagement efforts included technical presentations on the City's GHG emissions and climate change vulnerabilities, as well as discussions and exercises designed to gather community input on strategies for reducing emissions and adapting to climate change. A public workshop and a stakeholder focus group were held in April of 2021, while a second public workshop was held in June of 2021. The content of these engagements, along with a summary of the input received and the key takeaways, is summarized in Appendix D - Community Engagement Summary.

What Causes Climate Change?

Climate change is described as a significant and lasting change in the planet's weather patterns over a long time period. The science of global climate change is well-established; global climate models show that the warming of the climate system from human influence is unequivocal, primarily caused by human-generated GHG emissions. Over the past two centuries, enough GHGs have been released into the atmosphere to increase the global average temperature by 1.1°Celsius (1.9° Fahrenheit). Increasing temperatures have been changing the climate worldwide and, if left unchecked, threaten to dramatically disrupt our current way of life, locally and globally. According to the 2023 Intergovernmental Panel on Climate Change's (IPCC) Sixth Assessment Report, "Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since AR5 (IPCC's Fifth Assessment Report in 2014)." Regional changes in climate, particularly temperature increases and changing precipitation patterns, are already affecting natural systems worldwide and will have widespread impacts on water availability, food production, ecosystem biodiversity, and human health. These changes are causing significant impacts to the health, economy, and environment of the Los Angeles region.

The greenhouse effect is a natural phenomenon that helps keep Earth habitable. Certain gases in the atmosphere, called greenhouse gases, trap heat from the sun like a blanket, preventing it from escaping back into space. This trapped heat warms the planet, making it possible for life to proliferate. Higher concentrations of GHGs increase the greenhouse effect, as more heat is trapped in the Earth's atmosphere (IPCC, 2022). This natural effect is responsible for maintaining a habitable climate, but atmospheric concentrations of GHGs have accelerated since the mid-20th century due to human activity. Land use changes, burning of fossil fuels, and agricultural practices have all contributed to this observed increase. As a result, current atmospheric concentrations of GHG emissions now far exceed the average of the past several thousand years.

The most prevalent GHGs are carbon dioxide (CO_2) and water vapor. Other important GHGs are methane (CH_4), nitrous oxide (N_2O), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These gases are emitted through a variety of natural processes and human activities, some of which follow:

- CO2 and N2O are byproducts of fossil fuel combustion;
- N2O is associated with agricultural operations, such as fertilization of crops;
- CH4 is commonly created by off-gassing from agricultural practices (e.g., manure from cows) and the decay of organic waste in landfills;
- CFCs were widely used as refrigerants, propellants, and cleaning solvents; their production has been mostly eliminated by international treaty, but past emissions remain in the atmosphere due to their long lifespan;
- HFCs are now used as a substitute for CFCs in refrigeration and cooling; and
- PFCs and SF6 emissions are common byproducts of industries such as aluminum production and semi-conductor manufacturing.

By the end of the 21st century, GHGs in the atmosphere are expected to exceed known levels going back more than one million years. Climate models cited by the IPCC predict that without major reductions in emissions, the increase in annual average global temperature relative to preindustrial times could reach 7°F (4.4°C) or more by

2100 (IPCC, 2023). With significant reductions in emissions, the magnitude of the increase can be mitigated. To limit warming to 2°C, atmospheric GHG concentrations must be stabilized at less than 450 parts per million (ppm). This requires a reduction of GHG emissions globally by about 80 percent below 1990 levels by the year 2050. A target this aggressive is made especially challenging due to the current rapid rise of emissions in the developing world. Climate dynamics are complex, and predictions about our future climate include a level of uncertainty. Even so, current observations are consistent with modeling predictions and in many cases prove that existing models are conservative.

An expanding body of scientific research shows that human activity is a major contributor to observed increases in atmospheric CO_2 and other GHGs. In 2018, a consortium of U.S.-based science organizations led by the National Oceanic and Atmospheric Administration (NOAA) released its fourth comprehensive National Climate Assessment, indicating that global annually averaged surface air temperature has increased by about 1.8°F (1.0°C) over the last 115 years (1901–2016), representing the warmest period in the history of modern civilization. The report concludes, based on extensive evidence, that it is extremely likely that human activities, especially emissions of GHGs, are the dominant cause of the observed warming since the mid-20th century, stating "For the warming over the last century, there is no convincing alternative explanation supported by the extent of the observational evidence" (U.S. Global Change Research Program, 2018). The State of California periodically updates its own Climate Change Assessment to describe regional climate impacts, risks, and potential actions to address climate change. California's Fourth Climate Change Assessment (Fourth Assessment), its most recent update from 2018, provides adaptation strategy recommendations for California's energy sector, water resources and management, oceans and coasts, forests, wildfires, agriculture, biodiversity and habitat, and public health (OPR, 2018). California's Fifth Climate Change Assessment is currently in development.

Local Impacts of a Changing Climate

The City of Manhattan Beach, like other communities in California, is likely to face serious economic, social, and environmental challenges in the 21st century due to climate change. The City is already experiencing higher average minimum temperatures, and periods of extreme heat are expected to become longer and more intense over the next century (CalAdapt, 2025). In Southern California, the top 8 warmest years on record have all occurred since 2012, with the warmest annual average temperature recorded in 2014 (Office of Environmental Health Hazard Assessment, 2022). This trend is expected to continue along with other impacts including sea level rise, worsening air quality, more intense storms, and flooding. The timeline and degree to which climate change will impact the City is specific to each hazard, and there are both short- and long-term implications for human and natural systems. Climate change will have direct and indirect impacts to public health, including impacts on physical/mental health and wellbeing with greater risk of illness and hospitalizations, and greater risk of early mortality, particularly from extreme heat hazards. Along with impacts to public health, climate change can affect community services, public assets, and infrastructure. Sea level rise and extreme storms and flooding can damage roadways, evacuation routes, utility lines, and other critical resources that the community relies on. Manhattan Beach has a number of physical assets that are vulnerable to climate change, including parks, trees, and water supply infrastructure. Extreme heat events will impact the health of natural resources, including wildlife, trees and other vegetation in the City, and increase pressure on our

energy systems for cooling. Higher temperatures will also affect how people utilize public transit and active modes of transportation such as biking and walking.

Protecting Vulnerable Communities

Climate change presents significant threats to community health and wellbeing, from more extreme heat events, worsening air quality, changes in precipitation levels, to increased transmission of infectious diseases. Impacts from extreme heat and air pollution are especially significant for urban communities. In California, data on emergency department visits and hospitalizations for heat-related illnesses became available in 2005 – the highest recorded visits since were in 2017, when temperatures were unusually high, and in 2006 during a prolonged heat wave (OEHHA, 2022). Heat-related illnesses can be preventable, however, increasing temperatures will continue to pose a risk. Worsening air pollution and smoke from regional wildfires can also increase the risk for illnesses and hospital visits, particularly for respiratory diseases. Exposure to wildfire smoke has increased significantly since 2010, due to more frequent and severe wildfires. The worst wildfire year on record, 2020, saw a record-high for acres burned, resulting in at least 91 days of smoke plumes in LA County. These threats will not affect everyone equally. Vulnerable groups such as the elderly, immigrants, Black, Indigenous, People of Color (BIPOC) communities, and individuals already suffering from chronic diseases will be disproportionately impacted by these changes. The City of Manhattan Beach is home to vulnerable populations who experience heightened risk and increased sensitivity to climate fluctuations, and these people often have less capacity and fewer resources to cope with, adapt to, or recover from climate impacts. These include children, the elderly, individuals with pre-existing health conditions, rent-challenged families, and individuals or families with limited resources, among others.

Extreme heat, air pollution, sea level rise, flooding, and drought all have the potential to impact vulnerable populations and critical facilities that serve these groups. Generally, older populations and low-income households are at higher risk from all climate hazards due to limited financial resources and low capacity to respond quickly to hazardous events or to bounce back quickly from impacts. In the event of intense climate hazards, it will be critical for vulnerable populations to have reliable access to emergency services and resources. The adaptation measures outlined in this plan can help strengthen the capacity for vulnerable communities and critical infrastructure to withstand the effects of climate impacts and build resiliency for the future.

The Benefits of Taking Action

Emphasizing equity in the implementation of climate strategies can help to overcome deeply interrelated challenges that are faced by some members of the community. For example, if affordable housing is located far from job centers, workers must commute long distances, increasing vehicle miles traveled and worsening air quality for everyone. Locating housing closer to services or key destinations empowers residents to choose healthy and environmentally friendly mobility options such as biking or walking. Expanded public transit options can provide easier access to regional employment.

Many of the actions that address climate change can improve the health and wellbeing of vulnerable communities, who typically bear the brunt of poor air quality and unreliable public infrastructure. Investing in electric vehicle charging stations and public transit powered by clean energy can improve health outcomes and improve access to regional employment for these communities. Strategies that invest in building energy efficiency and electrification have the dual benefit of improving public health through better indoor air quality and reducing utility bills and maintenance costs. Creating pathways for new jobs in composting, recycling and reuse, and edible food recovery that are well-paying and do not require higher education can address food insecurity, reduce community exposure to toxins, and increase economic opportunity.

By instituting measures to deal with climate effects such as extreme heat and air quality impacts, Manhattan Beach is planning for climate change in a way that protects vulnerable populations and provides an equitable distribution of costs, benefits, and opportunities for all members of the community. The City of Manhattan Beach has an important role, in partnership with public agencies and community-based organizations, to alleviate historic disparities, educate and engage the public on climate change issues, and to promote community involvement in actions to reduce climate change risks.

Meanwhile, climate-related policies and regulations at the State level are generating profound economic change. The California government recognizes that reaching its GHG reduction targets requires innovation, public and private investments, and market adoption of new technologies in energy, transportation, materials, agriculture, water, waste management, and land management. New economic opportunities are emerging as the State and regional agencies direct investment, policy, and planning resources toward reducing GHG emissions. The City recognizes local economic development and GHG reduction as synergistic planning goals. The CAAP's measures represent local business opportunities related to renewable energy generation, energy efficiency improvements, waste reduction, and mobility, to name a few. By investing in skilled workers and new low-carbon technologies like clean energy, renewable materials, microgrids, and bio-based fuels, the City can develop new engines for job growth and sustainable economic prosperity.

The CAAP is not just a plan to reduce emissions; it is a plan for a sustainable and equitable Manhattan Beach community. From housing to transportation to waste and urban greening, it is important to incorporate principles of equity throughout the plan to ensure all community members benefit from climate planning.

Climate Action in California

Strategies for monitoring and addressing climate change have emerged at the international, national, state, and local levels, but the State of California has been a leader in developing mitigation and adaptation strategies. Since 2005, California has been developing policy and passing legislation that seeks to control emissions of gases that specifically contribute to global warming. These have included regulatory approaches, such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as cap-and-trade systems. Some regulations apply at the state level, but others are state-imposed mandates that are applicable at the municipal level and are required of local agencies and jurisdictions.

The major components of California's climate change initiative are identified below, and described in detail in Appendix B:

- Executive Orders S-3-05 and B-55-18;
- Global Warming Solutions Act of 2006 and 2016 (AB 32 and SB 32);
- California's Cap-and-Trade Program;
- Low-Carbon Fuel Standard (LCFS);
- California Climate Crisis Act (AB 1279) and the State's 2022 Scoping Plan Update;
- Pavley Regulation (AB 1493), Advanced Clean Cars (ACC), and the California Mobile Source Strategy;
- Renewables Portfolio Standard (RPS);
- Clean Energy and Pollution Reduction Act (SB 350);
- California Code of Regulations Title 24 (California Building Standards Code);
- Sustainable Communities and Climate Protection Act (SB 375); and
- California Climate Investments in Disadvantaged Communities (SB 535).

Through these State programs and regulations, in addition to local government action, CARB anticipates that the State will be able to achieve its GHG reduction goals set by AB 32, SB 32, and AB 1279. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020, a goal that was achieved in 2017; while SB 32 requires a statewide reduction of 40 percent below 1990 levels by 2030. AB 1279, enacted in 2022, requires a minimum reduction of 85 percent below 1990 levels by 2045, and the achievement of statewide carbon neutrality through natural sequestration and other means of carbon removal.

Relationship to Local Plans

The City's 2015 Strategic Plan includes Environmental Stewardship as one of the main objectives considered essential to the continued success of the City and its community:

> *The residents of Manhattan Beach place a high value on a healthy, outdoor, and recreational life style and are committed to protecting the environment of their beautiful coastal community. The City recognizes its leadership role in environmental stewardship and works to create a built environment that complements the natural environment. Manhattan Beach is recognized for its progressive environmental stewardship and healthy community initiatives. A healthy and active lifestyle is accessible for residents because the City is safe, sustainable and resilient.*

Creating a community climate action plan was a primary goal of the City's *2018 Environmental Work Plan*. The priority actions in the Work Plan also include:

- **Pollution Prevention:** Pass policies and launch public education programs to prevent plastic pollution
- **Climate Change and Energy:** Advance the City's climate change mitigation actions and renewable energy goals
- **Climate Resiliency & Sea Level Rise Adaptation Planning:** Build the City's climate resiliency capacity, including sea level rise vulnerability assessment and adaptation planning
- **Water Conservation, Smart Water Management, & Sustainable Landscaping:** Promote and enhance water conservation and smart water management
- **Community Partnerships, Professional Coalitions, & Environmental Education**
- **Emerging Issues:** Remain nimble to incorporate and consider action on areas of emerging concern/opportunity

In presenting measures for reducing community GHG emissions and increasing resilience to climate change, the CAAP is closely aligned with the goals and policies outlined in the City of Manhattan Beach General Plan (adopted in 2003) as well as the Manhattan Beach Municipal Code, and other City plans and policies related to sustainability. A summary of the City's relevant existing planning goals and policies, including those from the General Plan, is provided in Appendix C.

City of Manhattan Beach General Plan

The City of Manhattan Beach General Plan, adopted in December 2003, is intended to guide the growth of the City in a manner that best serves the City's citizens. The key goals and policies supporting climate action and adaptation are summarized in Appendix C, listed under the General Plan elements Community Resources, Mobility, Housing, Infrastructure, and Safety.

City of Manhattan Beach Local Coastal Program

On May 3, 2022, the City Council unanimously approved an amendment to the Manhattan Beach Local Coastal Program (LCP) aimed at addressing coastal hazards and sea level rise. The LCP Coastal Hazards chapter

incorporates findings from the City's Sea Level Rise Vulnerability Analysis as well as adaptation strategies detailed in the City's first Sea Level Rise Adaptation Plan, both completed in 2021. The LCP Coastal Hazards chapter includes the following elements: coastal hazards; public infrastructure and shoreline protective devices currently in place within the Coastal Zone; adaptation strategies; and adaptation policies to mitigate the potential impacts from coastal hazards. The updated LCP policies address safety measures to reduce potential impacts from natural and man-made hazards, and guidance for the maintenance, rebuilding, or installing of new shoreline protective devices. The Manhattan Beach LCP Update and Sea Level Rise Planning project were grant funded by California Climate Investments, a statewide program that puts billions of Cap-and-Trade dollars to work reducing GHG emissions, strengthening the economy, and improving public health and the environment. Relevant policies under the City's existing Local Coastal Program are also included in Appendix C.

City of Manhattan Beach Mobility Plan (2018)

The City of Manhattan Beach adopted its Mobility Plan in 2018, as an update to the Circulation Element of the 2003 General Plan, in an effort to plan, maintain, and operate the City's mobility system consistent with the principles of Complete Streets, active living, and sustainable community design, as well as address the concerns of residents regarding congestion and safety. The Mobility Plan provides a vision for the future of transportation in Manhattan Beach, seeking to provide for a balanced, multi-modal transportation system for the movement of people and goods within, to, and from the City. The Mobility Plan reflects the City's greater emphasis on non-motorized modes of transportation (bicycling and walking) as well as implementing streets that serve the mobility of all users by providing high quality pedestrian, bicycling, and transit access to all destinations throughout the City. The Mobility Plan's goals and policies that are most directly tied to community resilience and the reduction of GHGs are included in the policy and program summary below.

City of Manhattan Beach Housing Element Update (2022)

The City of Manhattan Beach adopted the 6th cycle Housing Element in September 2022. The State Department of Housing and Community Development (HCD) certified the document in May 2023. Housing elements are regularly updated to assess and respond to local demand for residential development. The City of Manhattan Beach, according to their Regional Housing Needs Assessment (RHNA) allocation by the Southern California Association of Governments (SCAG), was required to plan for 774 housing units during the 2021-2029 planning period. The Housing Element identifies housing programs that will aid Manhattan Beach in exceeding their housing allocation in a manner that best serves their citizens, through identification of underutilized sites and vacant sites, projected accessory dwelling units, future residential developments, and a Residential Overlay District (ROD).

City of Manhattan Beach Health and Safety Element

The City of Manhattan Beach is in the process of updating its Community Safety Element, which is anticipated to be complete shortly after the adoption of the CAAP. The update will incorporate by reference the relevant information that is included in the CAAP, and will identify the health-related co-benefits of climate action and GHG reduction measures. The current adopted version of the Safety Element does not address climate change.

City of Manhattan Beach 2020 Urban Water Management Plan (2021)

Under the Urban Water Management Planning Act established in 1983, the City of Manhattan Beach is required to prepare and adopt an Urban Water Management Plan (UWMP) and update it every five years. The current City's 2020 UWMP was updated in November 2021. The City' 2020 UWMP discusses existing and forecasted water demand, supply, and reliability. The primary objective of the UWMP is to evaluate the City's water supply and create a reliable management action plan for long-term resource planning to ensure adequate water supplies. The City is a sub-agency of the West Basin Municipal Water District (WBMWD). WBMWD prepared a 2020 Plan, which is incorporated in the City's 2020 Plan by reference. The City's UWMP provides scenarios of single-dry years and multiple dry years and a discussion on potential impacts on basin management practices.

The City's recycled water system is nearly optimized and is unlikely to expand substantially, as indicated in Table 6-6 of the UWMP. The City will continue to coordinate with WBMWD and take advantage of opportunities to expand recycled water facilities throughout its borders to optimize recycled water use within the City.

City of Manhattan Beach Water Master Plan (2021)

The City of Manhattan Beach updated the Water Master Plan (WMP) in 2021. It serves as a guide for planning water system improvements through the year 2030, focusing on identifying recommended improvements for increased water supply efficiency, economy, and reliability. The WMP includes a phased capital improvement program with recommended projects for facility and pipeline improvements through 2030, to optimize the water system operations safely and to help improve water quality service. The WMP does not address climate change or climate adaptation directly, however, it is critical to update the water infrastructure, much of which is aging, to ensure long-term and reliable service to Manhattan Beach customers.

City of Manhattan Beach Local Hazards Mitigation Plan (2017)

The City's Local Hazards Mitigation Plan (LHMP) identifies and profiles the hazards that could affect Manhattan Beach, assesses the risk of such hazards, describes the City's vulnerability, and estimates potential losses from hazards. The potential hazards identified and assessed in this version of the LHMP include: tsunami, earthquake, landslide, flood, climate change, drought, and adverse weather. The LHMP provides a list of activities that may assist the City of Manhattan Beach in reducing risk and preventing loss from future hazard events. The LHMP includes a policy to monitor rising sea levels and develop action items as needed to mitigate that hazard. The remaining policies in the LHMP do not address explicitly or directly address climate change hazards, but there are several policies related to emergency response and to flood control and stormwater management that provide a foundation for doing so in future updates. The LHMP will be updated shortly after the adoption of the CAAP and will include more detailed discussion on climate change hazards and incorporate climate-change adaptation policies.

CHAPTER 2
Climate Positive Goals

To support our vision of a "climate positive" community, the City strives to be carbon neutral by 2045, and to be resilient to current and future climate change hazards. To fulfill this vision, the City has outlined the following goals that are reflective of community concerns and aspirations, and informed by the adopted goals and policies in the City's General Plan.

Goal 1: An engaged, prosperous, and equitable community

Climate change represesents a threat to future prosperity, but new economic opportunities are emerging as State and regional agencies direct investment, policy, and planning towards reducing GHG emissions. The decarbonization of electricity supply and the design of new buildings to be zero net energy (ZNE) consumers are just two examples of the transformative developments needed for the State of California to reach its long-term GHG targets. Economic development and GHG reductions are synergistic planning goals; GHG reduction strategies can align with opportunities in clean technologies (cleantech) for increased green products and

services, energy efficiency, low-carbon transportation, and renewable materials. Support for green and cleantech businesses offer an opportunity to boost local employment growth, enhance regional economic competitiveness, and advance sustainability goals while reducing community-wide GHG emissions. Through the appropriate combination of local ordinances, funding sources, and small business incubators, the City can promote local cleantech businesses developing low-carbon products, services, and business solutions. Furthermore, a net reduction in fixed expenses by residents and businesses associated with energy and resource conservation programs allows for higher discretionary spending for consumers and subsequently injects more dollars into local retail and service economies.

The City of Manhattan Beach consistently ranks among the most educated, wealthiest, and healthiest cities in California. However, some neighborhoods and populations struggle with high levels of environmental burden, or socioeconomic gaps in housing burden and unemployment rates. The northeastern neighborhoods of Manhattan Village and East Manhattan (Liberty Village) experience relatively higher levels of pollution burden, due to diesel particulate matter and proximity to cleanup sites and hazardous waste sites. These neighborhoods also face greater housing cost-burden and levels of unemployment compared to other neighborhoods in Manhattan Beach (OEHHA, 2021).

Furthermore, the impacts of climate change – from flooding and extreme weather events, to deteriorated air quality, to severe droughts – disproportionately impact those who are historically over-burdened and under-resourced, including the elderly, infants and children, people of color, and people living in poverty. Implementation of GHG reduction measures and climate adaptation efforts can directly benefit disadvantaged communities through prioritized investments that increase the ability of these communities to prepare for climate change impacts; the City can prioritize the allocation of resources to these neighborhoods to help increase affordable housing and mobility options, while improving local access to parks and recreation. Further, programs facilitating climate action can help address some of the contributors of inequality by supporting community health programs and improving access to jobs, education, and training.

Aligns with:

- **Local Hazard Mitigation Plan Goal 2:** Improve public understanding, support, and need for hazard mitigation measures.
- **General Plan, Mobility Plan Goal I-1:** Provide a balanced, safe, and efficient multi-modal transportation system that serves the mobility needs of all community members, including children, seniors, and the disabled.

Goal 2: A reduced dependency on fossil fuels

In striving to be carbon neutral, the City aims to achieve net zero GHG emissions by the year 2045. This will be accomplished through a reduction in energy demand, transitions from natural gas to electric alternatives where feasible, and an increased reliance on renewable energy to meet the demands of transportation and the built environment. These efforts will help create jobs within renewable fuel production, public transport infrastructure, energy efficiency technology, and the clean-air vehicle industry. The expansion of active transportation infrastructure and reduction of fossil fuel combustion will reduce air and noise pollution and improve public health by reducing pollutant exposures and encouraging more walking and biking.

Aligns with:

- **General Plan, Housing Element Goal 3:** Provide a safe and healthy living environment for City residents.
- **General Plan, Mobility Plan Goal I-4:** Create well-marked pedestrian and bicycle networks to facilitate these modes of circulation.

Goal 3: A community with clean air

Due to higher atmospheric concentrations of GHG emissions the City faces risks from extreme heat events and degraded air quality. With higher temperatures and a changing climate, Southern California is anticipated to have more wildfires, more allergens, and an increase in conditions conducive to formation of ground-level ozone – a major component of smog. Degraded air quality can aggravate a wide range of health problems, including asthma and other debilitating and costly respiratory and cardiovascular diseases. Often these health impacts fall disproportionately on the poor, the elderly, communities of color, immigrant groups, persons with preexisting medical conditions, and people living in highly industrialized areas that are already burdened by environmental pollution (CNRA, 2014). The City's air quality will benefit from actions that reduce greenhouse gas emissions, as well as actions that mitigate the hazards associated with a changing climate.

Aligns with:

- **General Plan, Community Resources Element Goal CR-6:** Improve air quality.
- **General Plan, Mobility Plan Goal I-4:** Create well-marked pedestrian and bicycle networks to facilitate these modes of circulation.
- **General Plan, Housing Element Goal 3:** Provide a safe and healthy living environment for City residents.

Goal 4: Buildings and infrastructure that support human health and emissions reduction

The City will continue to promote the construction of a built environment that supports the health and well-being of our citizens. The expansion of green buildings and infrastructure will reduce water and energy use, and create physical environments that result in reduced illness and absenteeism among workers, higher worker productivity, higher test scores among students, and greater workplace satisfaction as a result of an improved urban environment that promotes better air quality and reduced heat intensity.

Aligns with:

- **General Plan, Community Resources Element Goal CR-5:** Conserve and protect the remaining natural resources in Manhattan Beach.
- **General Plan, Housing Element Goal 3:** Provide a safe and healthy living environment for City residents.

Goal 5: A safe and efficient transportation system that enhances mobility and reduces car dependency

A safe and efficient transportation system is at the heart of a thriving community and local economy. As outlined in the City's Mobility Plan (2018), the City is committed to providing high quality pedestrian, bicycling, and transit access to all destinations throughout the City, as appropriate, and designing streets to be inviting places for all users, with aesthetic appeal and amenities. Reducing car dependency through development of safe and accessible walking and bicycling infrastructure can increase physical activity, reduce air pollution, and lower injury collisions and fatalities. These health co-benefits can produce an array of cascading benefits, including reducing chronic disease, lowering obesity levels, reducing respiratory diseases, and improving mental health.

Aligns with:

- **General Plan, Mobility Plan Goal I-1:** Provide a balanced, safe, and efficient multi-modal transportation system that serves the mobility needs of all community members, including children, seniors, and the disabled.
- **General Plan, Mobility Plan Goal I-4:** Create well-marked pedestrian and bicycle networks to facilitate these modes of circulation.
- **General Plan, Land Use Element Goal LU-9:** Preserve the low-intensity, pedestrian-oriented character of commercial areas in the North End and El Porto.
- **General Plan, Housing Element Goal III:** Provide a safe and healthy living environment for City residents.

Goal 6: Sustainable production and consumption of resources

In a world of limited resources, sustainable production and consumption is an important way to reduce our impact on the planet. The City of Manhattan Beach has a proud history of minimizing waste and preserving resources. The City will continue to conserve and protect natural resources by eliminating food waste and finding better ways to reduce, reuse, and recycle the materials consumed by the community. The City will also promote the use of green products that eliminate toxic chemicals and have a more environmentally-friendly lifecycle.

Aligns with:

- **General Plan, Community Resources Element Goal CR-5:** Conserve and protect the remaining natural resources in Manhattan Beach.
- **General Plan, Infrastructure Element Goal I-12:** Protect the quality of the environment by managing the solid waste generated in the community.
- **Housing Element Goal III:** Provide a safe and healthy living environment for City residents.

Goal 7: Populations and neighborhoods that are resilient to climate change

As a community focused on resilience, Manhattan Beach will anticipate and adapt to changing climate conditions and extreme weather events by implementing measures that reduce people's exposure to climate change hazards, ensuring that systems are in place to respond to those hazards and improving assistance after a hazard event. Adaptation actions, such as strengthening emergency management and operations, conserving water and energy, and incorporating climate change conditions into planning, maintenance, and capital improvements will prepare the community for changing climate conditions. Many of these measures, like conserving water and energy, also have positive benefits for GHG reduction and cost savings. In addition, many GHG reduction measures will increase the resilience of local residents, businesses, and systems to climate change. For example, distributed, renewable energy systems can still function when utility grids fail during extreme heat events, localized flooding, wildfire, or other climate events. Similarly, supporting energy efficiency programs reduces utility bills, freeing up more funds for discretionary spending, which can potentially include healthier food, preventative health care, or building improvements that increase resilience to climate change.

Aligns with:

- **General Plan, Community Safety Element Goal CS-1:** Minimize the risks to public health, safety, and welfare resulting from natural and human-caused hazards.
- **General Plan, Community Safety Element Goal CS-3:** Maintain a high level of City emergency response services.
- **General Plan, Housing Element Goal 3:** Provide a safe and healthy living environment for City residents.
- **Local Hazard Mitigation Plan Goal 1:** Protect life, property, and reduce injuries from natural hazards.
- **Local Hazard Mitigation Plan Goal 5:** Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Goal 8: City buildings and infrastructure that are resilient to climate change

The City's buildings and physical infrastructure must be prepared to withstand the impacts of rising seas, more extreme storms, extended droughts, and more intense heat waves. Critical public infrastructure at risk includes power generation and transmission, stormwater drainage systems, water supply systems, and wastewater treatment systems. Impacts to public buildings can reduce the City's ability to coordinate human resources and equipment during hazard response and recovery. Such facilities include City-owned buildings and offices, community buildings and libraries, public works yards, hospitals, and schools.

Aligns with:

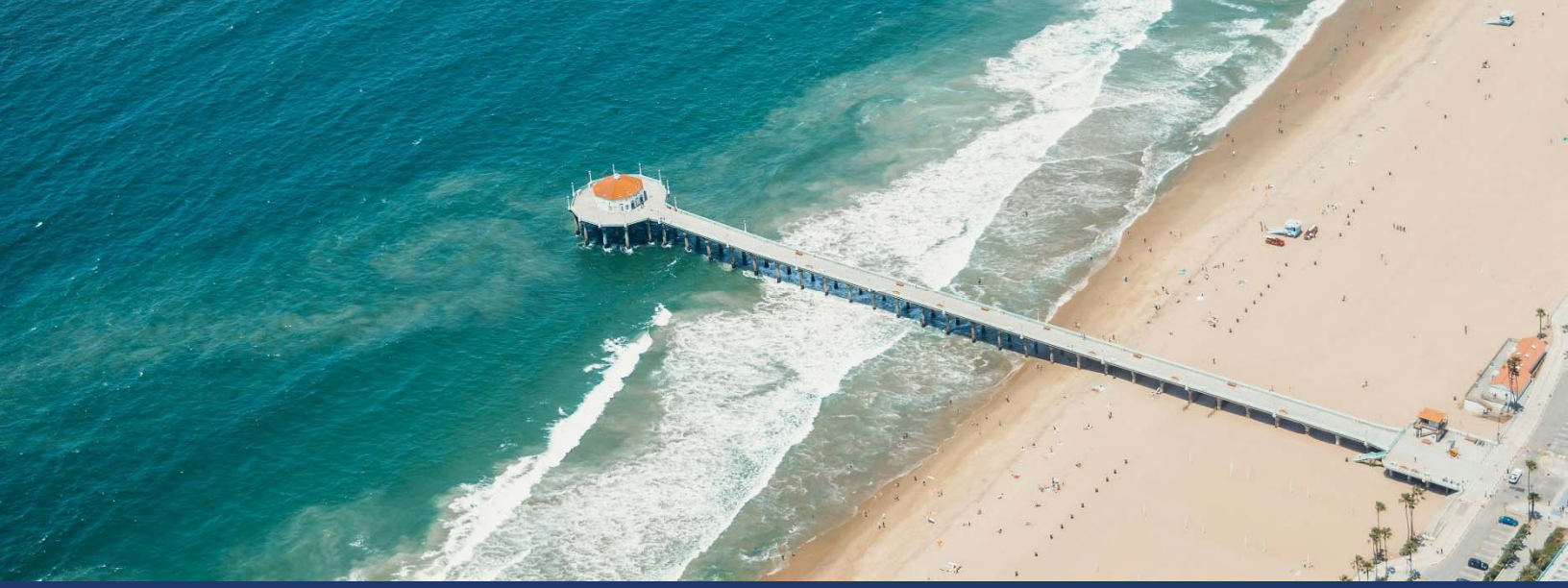
- **General Plan, Community Safety Element Goal CS-1:** Minimize the risks to public health, safety, and welfare resulting from natural and human-caused hazards.

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

Parks, trees, and urban green spaces not only provide important recreational and aesthetic benefits to the community – they also sequester carbon dioxide from the atmosphere and provide important benefits to climate adaptation. Trees and other plants help cool the surrounding environment during heat waves by offering shade and releasing water through their leaves, while open space, in general, provides important ecosystem and flood protection benefits. Beaches also serve as a buffer to coastal communities from extreme heat. The City will seek opportunities to expand its green infrastructure through strategies that encompass ecosystem services and natural systems for adaptation and resilience, such as increased tree canopy for carbon sequestration and vegetated buffers for improved stormwater management.

Aligns with:

- **General Plan, Community Resources Element Goal CR-1:** Maintain a park, recreation, and open space system that provides a variety of recreational opportunities accessible to all residents and meets the needs of all residents.
- **General Plan, Community Resources Element Goal CR-4:** Preserve the existing landscape resources in the City, and encourage the provision of additional landscaping.
- **General Plan, Community Resources Element Goal CR-5:** Conserve and protect the remaining natural resources in Manhattan Beach.
- **Local Hazard Mitigation Plan Goal 3:** Balance natural resource management and land use planning with natural hazard mitigation to protect life, property, and environment.



CHAPTER 3

Understanding the Community's Greenhouse Gas Emissions

The City of Manhattan Beach GHG inventory quantifies the annual GHG emissions resulting from activities within the City by residents, businesses, and the City government. The community inventory provides an understanding of where GHG emissions are originating and informs development of the effective strategies and actions to reduce emissions.

The City's baseline community GHG Inventory for 2005 forms the basis for setting emissions reduction targets and measuring future progress. Forecasts of the City's future emissions are based on current best estimates for population, households, and job growth within the City under "business-as-usual" (BAU) conditions, and under an 'adjusted' forecast scenario that includes the effect of state-mandated GHG reduction programs.

Community Emissions Inventory

The City has completed multiple GHG emission inventories spanning the years 1990 to 2021, initiated by the City and by the South Bay Cities Council of Governments (SBCCOG), including the Climate Action Plan for Municipal Operations (2010), the Energy Efficiency Climate Action Plan for the City of Manhattan Beach (2015), the Climate Action Plan for the City of Manhattan Beach (2017), and recently completed inventory updates produced by ICLEI - Local Governments for Sustainability USA. These include municipal operations inventories for the years 1990, 2005, 2007, 2010, 2012, 2017, and 2021, and community-wide inventories for the years 1990, 2005, 2007, 2010, 2012, 2016, 2019, and 2020.

The year 2005 is selected as the City's baseline community GHG inventory due to its relative accuracy and completeness. The older 1990 inventory is considered less accurate because it was not based on actual activity data (electricity use, vehicle miles traveled, etc.) from 1990, but instead was developed by back-casting from 2005 emissions values based on the City's population growth that had occurred since that time.

Table 3-1 presents the 2005 to 2020 community inventories, broken down by major sector. Figure 3-1 shows the percent contribution by sector for the 2005 community inventory. Figure 3-2 plots the City's community-wide inventory data from 2005 through 2016. As depicted in Table 3-1 and Figure 3-1, on-road transportation contributes the most to the community inventory, followed by non-residential electricity, residential natural gas, residential electricity, and water. Combined, these sectors represent approximately 92 percent of the total baseline inventory, with the remaining sectors (non-residential natural gas, solid waste, off-road equipment, and wastewater) contributing approximately 8 percent. Total community-wide emissions show a downward trend from 2005 to 2020, dropping significantly from 2012 to 2020, as seen in Figure 3-2.

Table 3-1 City of Manhattan Beach 2005 Community GHG Emissions

SECTOR	EMISSIONS (MTCO2e)[a]						
	2005	2007	2010	2012	2016	2019	2020
On-Road Transportation	222,636	221,255	213,722	214,640	214,944	215,172	153,269
Residential Electricity	29,846	29,641	31,836	33,217	24,141	17,976	23,961
Non-Residential Electricity	69,247	60,312	65,794	63,699	51,591	32,272	38,144
Residential Natural Gas	38,009	37,786	37,532	39,160	31,821	36,605	37,111
Non-Residential Natural Gas	12,376	20,170	12,527	12,128	12,135	10,879	9,186
Off-Road Equipment	1,882	2,061	1,820	1,782	6,398	306	4,226
Solid Waste	11,830	11,682	7,879	5,979	9,254	6,518	6,659
Water	21,912	30,611	13,327	12,506	11,097	7,570	9,543
Wastewater	140	107	107	107	65	144	144
TOTAL	407,878	413,625	384,544	383,218	361,446	327,442	282,243

Notes: a - MTCO2e represents metric tons of carbon dioxide equivalent; Totals may not add up due to rounding.

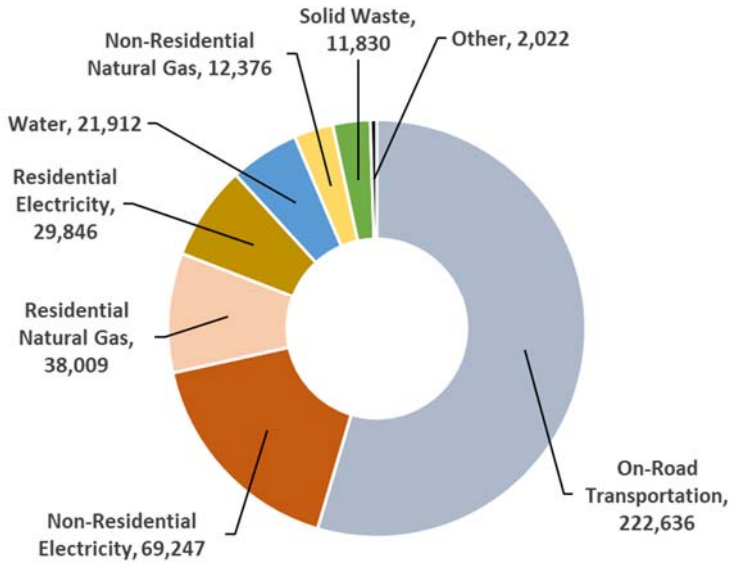


Figure 3-1. 2005 Community GHG Emissions by Sector

Source: ESA, 2024

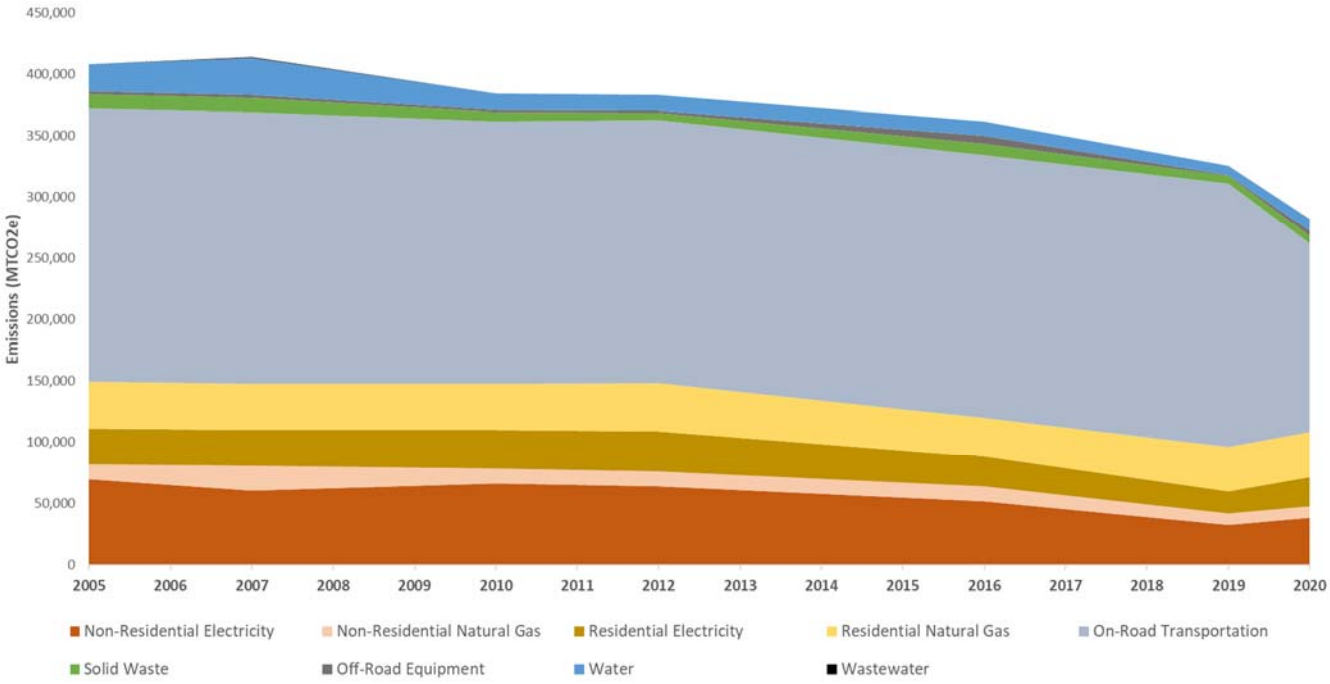


Figure 3-2. 2005 – 2020 Community GHG Emissions by Sector

Source: ESA, 2024

Community Emissions Forecasts

Table 3-2 details the growth in population, housing, and employment that is expected for Manhattan Beach through the year 2045. These factors are used to develop a BAU emissions forecast out to the year 2045, as shown in Figure 3-3, which indicates how community emissions would increase in the absence of State regulations (e.g., renewable energy and vehicle fuel efficiency standards) and if no additional actions were taken by the City to reduce emissions. Note that emissions are forecasted from 2019 for future years. Emissions in 2020 are not representative of a normal reporting year due to the COVID pandemic and stay-at-home orders that had a significant effect on the on-road transportation emissions within the City.

Table 3-2 City of Manhattan Beach Socioeconomic Data

	SOCIOECONOMIC DATA			GROWTH RATES	
DEMOGRAPHIC	2019	2030	2045	2019-2030	2019-2045
Population	35,338	36,200	37,563	2.3%	6.1%
Housing	14,088	14,367	15,038	2.0%	6.8%
Employment	19,138	19,833	21,177	3.6%	10.7%

Notes: 2030 and 2045 data were linearly interpolated and forecasted using the available years of data from the SCAG mode.
Source Southern California Association of Governments (SCAG) 2016-2040 RTP/SCS Final Growth Forecast by Jurisdiction.

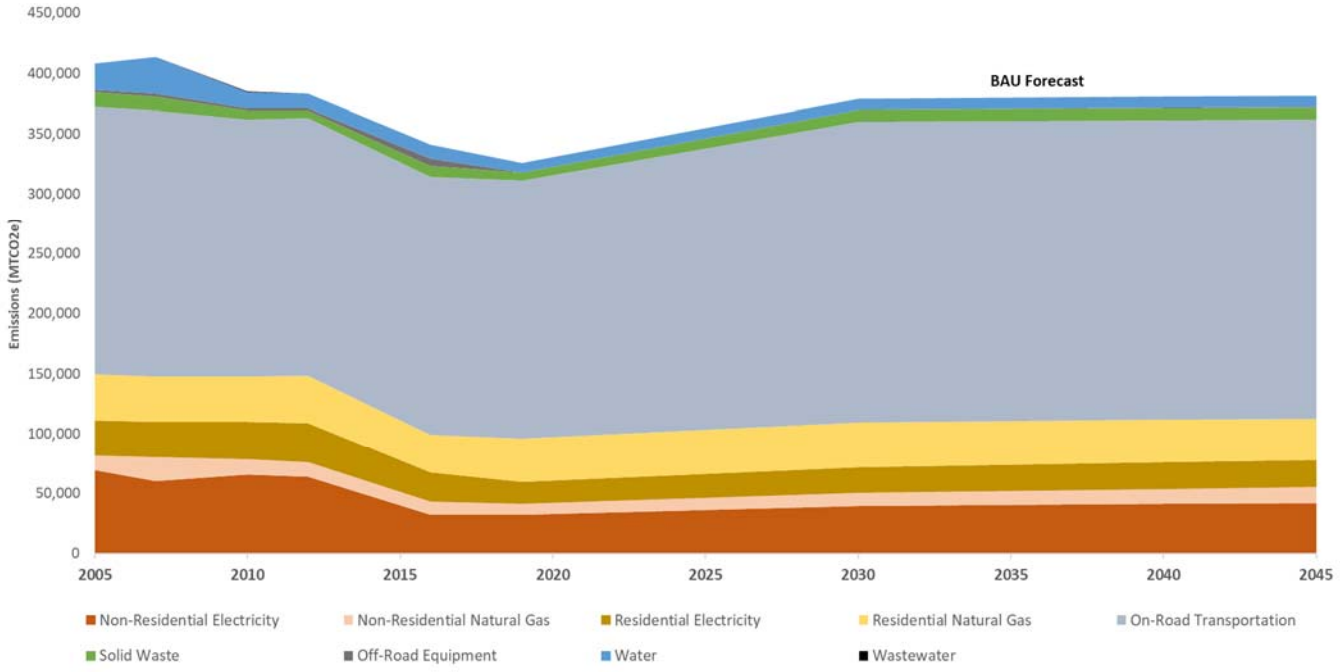


Figure 3-3. Community GHG Emission BAU Forecasts by Sector (MTCO2e)

Source: ESA, 2024

Adjusted Forecast Accounting for State Policies and Regulations

Significant emissions reductions in community GHG emissions are anticipated as a result of state programs and regulations, including the efficiency standards for passenger vehicles (e.g., Pavley II/Advanced Clean Car standards), reduction in carbon content of transportation fuels (e.g., the LCFS), and minimum renewable energy requirements for utilities (e.g., the Renewables Portfolio Standard). Measures regulated and implemented by the state and federal government achieve reductions without additional action by the City. For example, even if the vehicle miles traveled (VMT) within the City remain constant over time, the resulting GHG emissions would decrease because as new, more GHG-efficient vehicles are purchased, older, less efficient cars are being replaced.

S1: Renewables Portfolio Standard, SB 350, and SB 1020

California's Renewables Portfolio Standard (RPS) was established in 2002 under SB 1078, requiring the renewable energy portion of a utility's portfolio to be at least 20 percent by 2020. In 2011, SB 2 (1X) increased the RPS to 33 percent by 2020. SB 350, passed in 2015, increased the RPS to 50 percent by 2030 and requires a doubling of energy efficiency of existing buildings statewide by 2030. SB 100, passed in 2018, increases the RPS requirement to 60 percent eligible renewables by 2030 and 100 percent by 2045. SB 1020 adds interim renewable energy and zero-carbon energy retail sales of electricity targets to California end-use customers set at 90 percent in 2035 and 95 percent in 2040. It accelerates the timeline required to have 100 percent renewable energy and zero-carbon energy procured to serve state agencies from the original target year of 2045 to 2035. This law requires each state agency to individually achieve the 100 percent goal by 2035, with specified requirements. The emissions reductions associated with these energy performance goals are reflected in the City's Adjusted BAU forecast.

S2: Pavley Vehicle Standards and the Mobile Source Strategy

Transportation measures in particular are designed to achieve consistent GHG emissions reductions across the state by increasing vehicle efficiency and reducing the carbon intensity of fuels used by the statewide vehicle fleet. These measures include the Pavley II/CAFE (Corporate Average Fuel Economy) Vehicle standards (known as the Advanced Clean Cars initiative in California), the LCFS, the Tire Pressure Program, the Tire Tread Standard, and the Heavy Duty Vehicle Emission Reduction Program.

S3: CALGreen (Title 24 Building Energy Efficiency Standards)

Under California's green building standards (CALGreen), Title 24, Part 6 (Building Energy Efficiency Standards for Residential and Non-residential Buildings), establishes statewide building energy efficiency standards to reduce California's energy consumption. The provisions include mandatory requirements for efficiency and design of energy systems, including space conditioning (cooling and heating), water heating, and indoor and outdoor lighting systems and equipment, and appliances. California's Building Energy Efficiency Standards are routinely updated on an approximate three-year cycle as technology and methods evolve. The 2019 standards required new residential buildings to install rooftop solar photovoltaic systems. The current standards (2022), made effective on January 1, 2023, expand this requirement to multifamily buildings with more than three habitable stories. The 2022 code also allows natural gas use in new residential buildings, but mandates

electric-ready requirements to make it easier to switch to electric appliances in the future. The next iteration of the energy standard, expected to go into effect in January 2026, will include new prescriptions and performance standards for building electrification.

S4: Waste Diversion Mandates

Recycling or reusing materials rather than disposing of them in landfills reduces GHG emissions by reducing the need to harvest and transport new raw construction materials. Recycled materials can be locally repurposed and reused. Products that are repaired, reused, or designed to last longer avoid the energy-related emissions associated with the harvesting of virgin materials and manufacturing of new products. Composting organic waste prevents it from decomposing anaerobically in landfills where it creates methane (a powerful greenhouse gas), and composting helps build healthy soils and plants, which serve as reservoirs for carbon that would otherwise be released into the atmosphere. State regulations to reduce GHG emissions associated with solid waste include SB 1383, which sets a statewide goal of diverting at least 75 percent of organic waste from landfills by 2025, including the recovery of 20 percent of edible food waste for human consumption; AB 341 established a statewide goal of 75 percent recycling through source reduction, recycling, and composting by 2020. Both SB 1383 and AB 341 require commercial businesses, multi-family dwellings, and public entities to have a recycling program in place.

Table 3-3 Annual GHG Reductions from State Measures by 2030 & 2045 ($MTCO_2e$/Year)

STATE MEASURE	2030	2045
S1: Renewables Portfolio Standard and SB 350	25,356	62,829
S2: Pavley Vehicle Standards and the Mobile Source Strategy	52,468	56,864
S3: CALGreen (Title 24 Building Energy Efficiency Standards)	Not Quantified	Not Quantified
S4: Waste Diversion Mandates	Not Quantified	Not Quantified
TOTAL	77,825	119,693

Notes: MTCO2e represents metric tons of carbon dioxide equivalent; Totals may not add up due to rounding.

The effect of these statewide measures on the City's 2030 forecasted emissions is summarized in **Table 3-3,** while their collective effect through the year 2045 is shown in **Figure 3-4**. By 2030, these measures are expected to reduce community emissions by approximately 78,000 $MTCO_2e$, or an estimated 20.5 percent from the 2030 BAU forecast. By 2045, state-wide measures are expected to reduce community emissions by approximately 120,000 $MTCO_2e$, or an estimated 31.4 percent from the 2045 BAU forecast. The result is referred to as the Adjusted BAU emissions forecast.

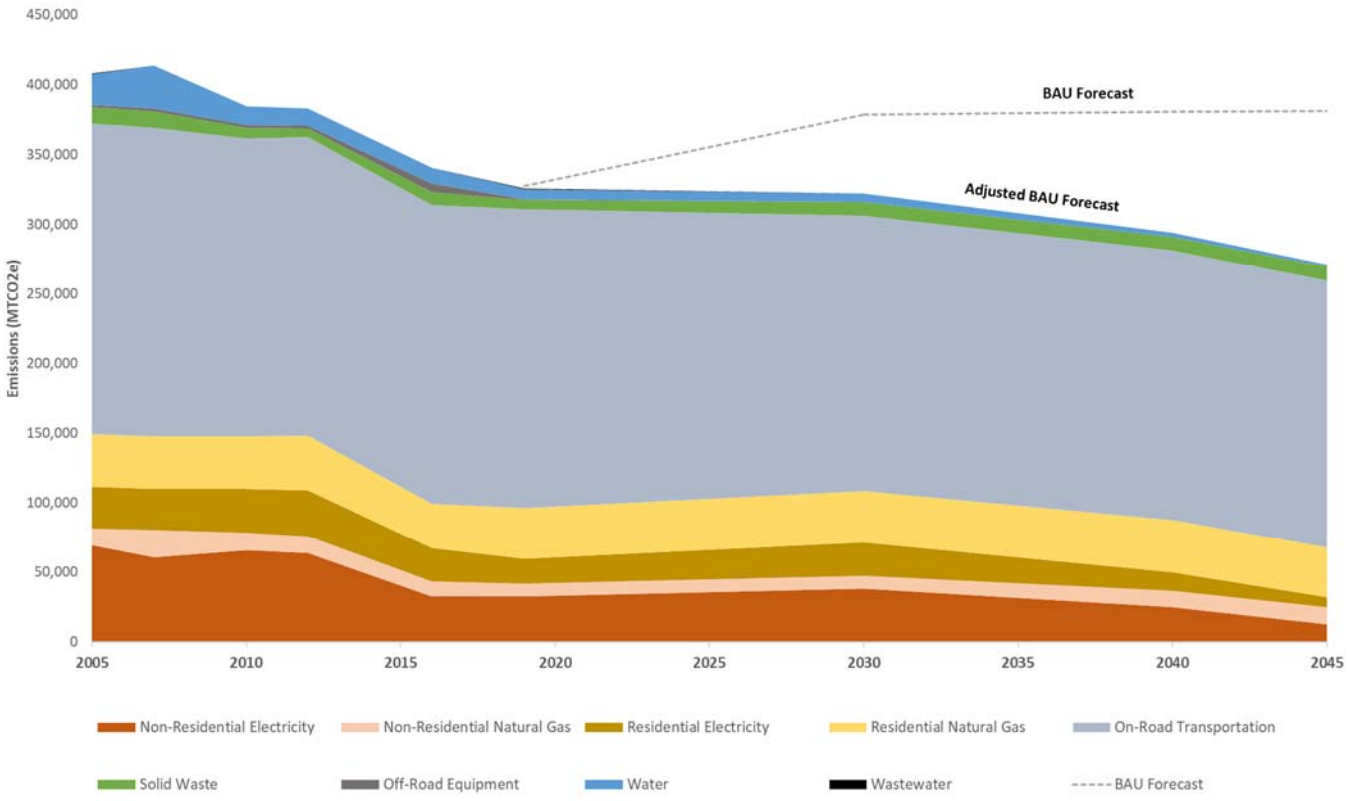


Figure 3-4. Community GHG Emissions Adjusted BAU Forecasts by Sector (MTCO2e)

Source: ESA, 2024

GHG Reduction Targets

The City is aligning its GHG reduction targets to be consistent with statewide reduction targets as established by Senate Bill 32 (SB 32) and Assembly Bill 1279 (AB 1279). SB 32 established a statewide 2030 GHG reduction target of 40 percent below 1990 levels by 2030. AB 1279 established a statewide 2030 GHG reduction target of 85 percent below 1990 levels by 2045 and a statewide carbon neutrality goal by that same year. Figure 3-5 illustrates the City's targets for 2030 and 2045 that align with SB 32 and AB 1279, respectively. Accounting for statewide emissions growth that occurred between 1990 and 2005, the 2030 state-aligned target equates to a reduction of approximately 48 percent below the City's 2005 baseline, while the 2045 state-aligned target equates to a reduction of approximately 87 percent below the 2005 baseline. As the figure indicates, the Adjusted BAU Forecast, which accounts for statewide measures, indicates that achieving the City's 2030 and 2045 targets require additional contributions from local reduction measures. Figure 3-5 also illustrates how the Adjusted BAU forecast compares with a carbon neutral goal.

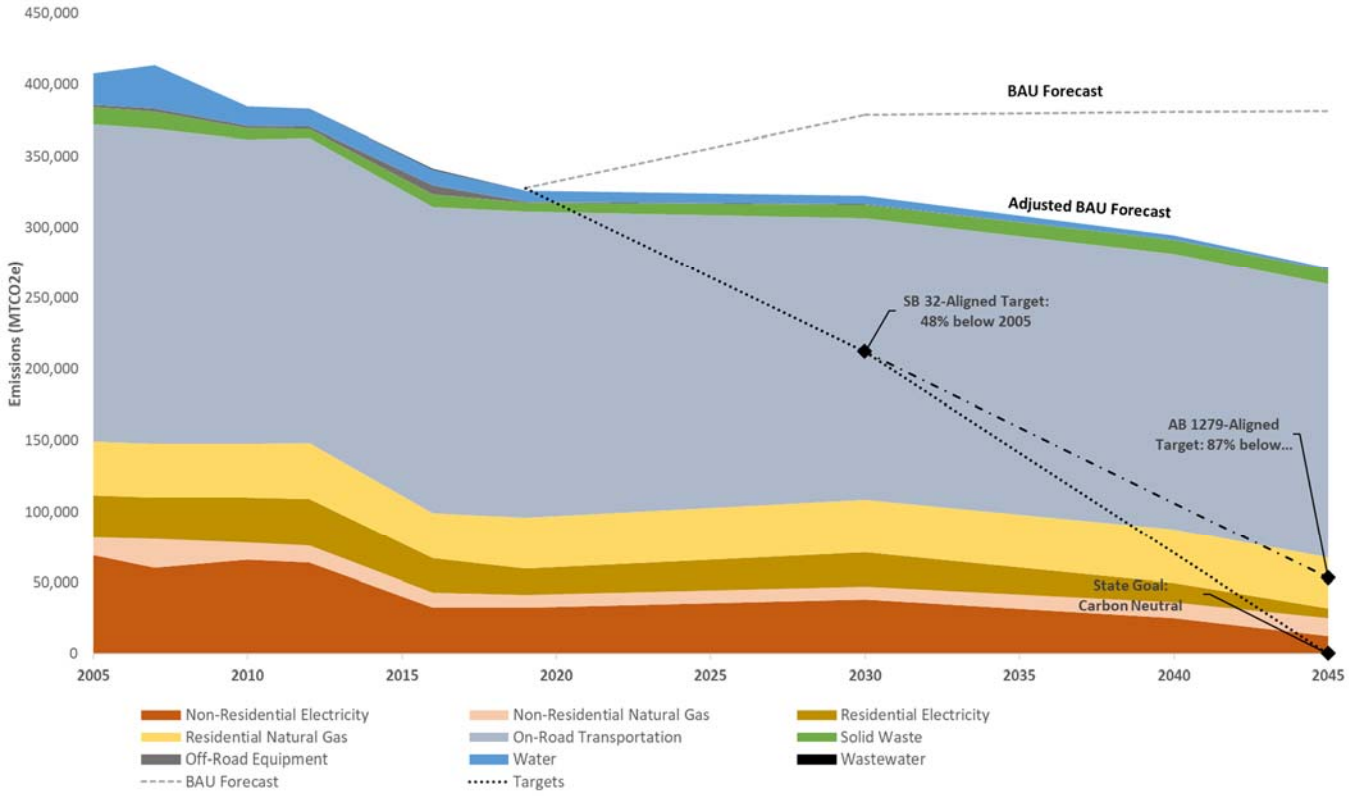


Figure 3-5. Community GHG Emissions Target Aligned with State Mandates (MTCO2e)

Source: ESA, 2024

CHAPTER 4

Understanding Local Vulnerabilities to Climate Change

Human-caused emissions of carbon dioxide and other GHG emissions are major drivers of global climate change. GHGs trap heat in the atmosphere, resulting in warming over time. This atmospheric warming leads to other changes in the earth systems, including changing patterns of rainfall and snow, melting of glaciers and ice, and warming of oceans. The extent of climate change in the future depends in large part on how successfully our global civilization can reduce emissions over the next several decades. GHG emissions are driven by economic systems, land use patterns, transportation and energy systems, and other social and political factors. As a result, climate scientists cannot be certain how emissions will change in the future.

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

Scientists use GHG emission scenarios to understand a range of potential climate projections. For planning purposes, these typically include a *higher emission scenario* (or business as usual) where emissions continue to rise, along with population growth through 2050, and plateau around 2100 and a *lower-emissions scenario* where emissions peak around mid-century then decline, due to worldwide efforts to reduce them. To assess the

potential impacts or risks associated with climate change, this document typically considers data and forecasts representing an average climate model for the higher emissions scenario.

Assessing Climate Change Impacts

Within the City of Manhattan Beach, the changing climate is expected to result in rising sea levels, more extreme heat, worsening air pollution, an increase in regional wildfires, and more intense storms and inland flooding. The resulting consequences depend on the exposure and sensitivity of populations and infrastructure to climate change impacts and the extent to which a community is resilient and has resources to adapt. As such, climate change vulnerability considers both the exposure and sensitivity of populations and infrastructure to climate change hazards.

The findings in this chapter incorporate findings from the City's *Sea Level Rise Risk, Hazards, and Vulnerability Assessment* (August 2021).

Risk and Onset

Some climate change impacts, such as extreme heat, are already part of the lived experience in Manhattan Beach. Other impacts, such as rising sea levels, are occurring more slowly and the consequences may not be experienced for a number of years. The certainty that scientists have about the intensity and timing of climate change impacts varies depending on the hazard.

Shocks and Stressors

The impacts of climate change can be felt through sudden or acute events that threaten a community's population and infrastructure such as flood events and heatwaves. These types of short-term, intense impacts can be thought of as "shocks." However, climate change can also result in long-term chronic impacts, or "stressors" that can weaken natural and built systems and resources, and exacerbate inequity, homelessness, and an aging infrastructure. Stressors can worsen the effects of shocks and make it more difficult for a community to adapt to climate change.

Components of Climate Change Vulnerability

Exposure

Exposure is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.

Sensitivity and Impact

Sensitivity describes the degree to which an asset such as a community, a physical asset, or a natural system would be affected by changing climate conditions. An impact refers to the specific negative result of a climate change effect.

Adaptive Capacity

Adaptive capacity refers to the ability of community populations and physical assets to adjust to climate change stressors and cope with the consequences. Adaptive capacity can be provided through physical design (e.g., back-up generator), or it can take the form of policies, plans, programs, governance, or institutions.

Vulnerable Populations

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 change. Contributing factors include, but are not limited to, race, class, sexual orientation and identification, national origin, and income inequality (ICARP, 2021). Additionally, historic inequity in land use and zoning policies, underinvestment in vulnerable communities, and lack of meaningful engagement in planning and policy making have created disparities in how prepared communities are to adapt to the impacts of climate change (APEN, 2019). Many individuals experience multiple and intersecting vulnerabilities which can put them particularly at risk with regard to climate change. For example, black and Hispanic mothers are more likely to be single heads of household and are also more likely to be low income, live in flood prone areas, and have health issues that can be exacerbated by climate change.

Vulnerable Populations

Vulnerable populations in the City of Manhattan Beach include:

- Children (5%)
- Seniors over 65 (17%)
- Low-income households with severe housing cost burden (22%)
- Households without access to a car (3%)
- Individuals with disabilities (2%)
- Low-income individuals (7%)
- Outdoor workers (4%)
- Renters (30%)
- Single-parent households (12%)
- Unemployed/underemployed (26%)
- Unhoused individuals (less than 1%)
- Uninsured individuals (3%)

Vulnerable populations in Manhattan Beach include those that are disproportionately impacted by social, environmental, and health conditions, such as the populations listed in the text box to the left that were identified by public workshop participants[2]. These include children, elderly, individuals with pre-existing health conditions, rent-challenged families, and individuals or families with limited resources, among others. Additionally, communities with fewer trees or less access to parks and open spaces are more vulnerable to the impacts of extreme heat, poor air quality, and in some cases extreme flooding. While these groups are all considered vulnerable, some areas in the City have more populations and conditions that further increase vulnerability. In Manhattan Beach, these include the following: cardiovascular disease, low birth weight, housing burden, linguistic isolation, poverty, unemployment, lack of automobile access, active commuting, low park access, low tree canopy, uninsured individuals, children, elderly, and outdoor workers.

The paragraphs below describe in more detail which communities within Manhattan Beach have higher concentrations of vulnerable populations and discusses the challenges these populations face in adapting to climate change.[3]

[2] Data for the vulnerable populations in the City of sourced from Healthy Places Index 3.0, U.S. Census Bureau, and Los Angeles Homeless Services Authority (LAHSA).

[3] Refer to Appendix D for additional data on social, economic and health vulnerability indicators in Manhattan Beach.

It is important to note that not all indicators of vulnerability have sufficient data. For example, seasonal visitors are vulnerable to local climate change impacts, however, it is challenging to identify data and degree of vulnerability. Due to its well-known beaches, Manhattan Beach is a popular destination for visitors and seasonal residents, who are less likely to receive information or warnings regarding potential climate impacts and be less aware of available programs and policies to reduce impacts such as evacuation plans and routes etc. Therefore, seasonal residents and visitors may be less prepared and more vulnerable to climate change impacts such as flooding. Additionally, visitors from surrounding areas may increase in the future as other beaches are lost, and as extreme heat events further inland spur more people to seek respite at the coast. Los Angeles County estimates that Redondo Beach and Torrance Beach may be completely eroded by 2100. This will likely increase the demand for beach access at Dockweiler State Beach, Manhattan Beach, and Hermosa Beach, which are expected to lose about half their width, but maintain around 200-foot-wide beaches by the end of the century.

Seniors Over 65

Within the City of Manhattan Beach, 17 percent of people are at least 65 years old. In particular, in the neighborhood south of Manhattan Beach Blvd and west of Sepulveda Blvd and the neighborhood east of Sepulveda Blvd and north of Manhattan Beach Blvd 19-20 percent of people are 65 years old or older. Older adults may be less mobile and may have more trouble evacuating in the event of flooding or another climate event (PHASoCal, 2022).

Unemployed/Underemployed

Compared to the City of Manhattan Beach as a whole where 74 percent of people aged 20-64 are employed, south of Manhattan Beach Blvd and west of Sepulveda Blvd, only 68 percent of people in this age group are employed. Unemployed or under employed individuals may be more vulnerable to the impacts of climate change as they may have less access to financial and other resources, which may make adaptation to climate change more difficult (PHASoCal, 2022).

Poverty and Low Income

Compared to the City as a whole where seven percent of individuals have an income below 200 percent of the federal poverty threshold,[4] within North Manhattan Beach nine percent of individuals have an income below 200 percent of the federal poverty threshold. Low-income households and individuals are more likely to live in inadequate housing and are more likely to live in areas that are already disproportionately impacted by pollution, health problems, and natural disasters. Low-income communities have less access to financial resources and are more likely to be uninsured, which makes adaptation and recovery from coastal hazards more difficult. Additionally, low-income households often do not have access to vehicles, which can make evacuating more difficult (PHASoCal, 2022).

Housing Burden

Within the City of Manhattan Beach, 22 percent of the population, including homeowners and renters, experience severe housing cost burden (PHASoCal, 2022). Compared to the City as a whole, where seven percent of low-income homeowners spend more than 50 percent of their income on housing costs, nine percent of low-income homeowners in the neighborhood east of Sepulveda Blvd and north of Manhattan Beach Blvd do so. For low-income renters, 15 percent of the population citywide spend more than 50 percent of their income on housing costs. High housing costs and housing instability reduce a household's access to financial resources

[4] 200 percent of the federal poverty level is often used to represent poverty in California due to high costs of living.

and may make a household more likely to be uninsured, all of which makes adaptation and recovery from coastal hazards more difficult (PHASoCal, 2022).

Children

Approximately five percent of the population of the City of Manhattan Beach is under five years of age. Children under the age of five are in a critical period of development and therefore are more vulnerable to the effects of heat waves, pollution, undernutrition, vector-borne diseases, as well as respiratory and cardiovascular diseases due to anatomical, cognitive immunological, and psychological differences between children and adults (PHASoCal, 2022; Lawrence et al., 2018).

Linguistically Isolated Households

Data from the South Bay Cities Council of Government Vulnerability Assessment for Manhattan Beach suggests that between five and 10 percent of households between 17th Street and Manhattan Beach Blvd do not have an adult that speaks English, which is significantly higher than the percentage of linguistically isolated households in other portions of the City. Additionally, the neighborhood south of Manhattan Beach Blvd and east of Sepulveda Blvd have a higher percentage of linguistically isolated households. Households without an English speaker at home are considered to be linguistically isolated and may have more difficulty accessing information about evacuation. Linguistic isolation can increase vulnerability during climate events such as flooding (SBCCOG, 2019).

Outdoor Workers

Outdoor workers in Manhattan Beach include surf and camp instructors and lifeguards, as well as individuals engaged in beach maintenance, outdoor recreational activities, outdoor dining, landscaping, construction, and other environmental conservation efforts. Approximately four percent of people ages 16 and older are employed outdoors in Manhattan Beach. The City has a lower percentage of persons ages 16 and older that work outdoor than approximately 93 percent of other California cities (7th percentile). Outdoor workers are at high risk from climate hazards, including extreme heat, flooding, severe weather, air pollution and wildfire smoke, and others. Outdoor workers also face health-related risks caused by extreme heat, such as heat stress and heat stroke (PHASoCal, 2022).

Cardiovascular Disease

Cardiovascular or heart disease refers to conditions that affect the blood vessels of the heart, which can result in heart attacks, heart failure, stroke, and other impacts to the heart and brain. From 2015 to 2017, an average of eight people per 10,000 in Manhattan Beach have visited the emergency department for a heart attack. This rate is lower than approximately 85 percent of other areas statewide (OEHHA, 2021). Individuals with cardiovascular disease are at greater risk of impacts from worsening air pollution and wildfire smoke. Similar to outdoor workers, individuals with cardiovascular disease can also face additional risk from extreme-heat related impacts.

Low Birth Weight

Air pollution can contribute to low birth weight of babies, which can affect their risk of developing asthma or other conditions and increase risk of premature death (OEHHA, 2021). Additionally, other health impacts from climate change can add more stress to low-birth-weight babies and children. Within Manhattan Beach, approximately four percent of babies are born with a low birth weight (PHASoCal, 2022). The neighborhood to the southeast of Manhattan Beach Blvd and Sepulveda Blvd has the greatest percentage of births with low birth

weight, compared to other neighborhoods, at almost six percent. The low-birth-weight rate in this neighborhood is greater than 74 percent of other census tracts statewide (PHASoCal, 2022).

People Lacking Health Insurance

Having health insurance greatly improves health outcomes by connecting people with the necessary medical care. Individuals without access to healthcare are more vulnerable to the health impacts of flooding and the mental health impacts of climate change (SBCCOG, 2019). Of the total population, almost three percent of adults (aged 18 to 64 years) lack health insurance. This is greater for adults living in the neighborhoods east of Sepulveda Blvd, as an average of 20 percent of adults do not have health insurance. This is significantly higher than the percentage of uninsured individuals in other portions of the City.

Automobile Access

The majority of households in Manhattan Beach, 97 percent, have access to an automobile. Automobiles contribute to worsening air pollution and greenhouse gas emissions and simultaneously can provide protection from certain climate impacts, such as extreme heat, flooding, and severe weather. Individuals that do not have access to vehicles may experience greater vulnerability to these climate events, particularly those who will still need to travel, work outdoors, or partake in other unavoidable activities that increase their exposure.

Active Commuting

While active commuting provides various benefits for air quality, physical activity, and health, it also increases risk for individuals during climate hazards, especially for those who do not have access to a vehicle during climate events or emergencies. Individuals who engage in active commuting by bike, transit, or walking can experience greater exposure to climate events, particularly extreme heat, flooding, severe weather, and air pollution and wildfire smoke. The southwestern neighborhood of Manhattan Beach has the greatest percentage of individuals who engage in active commuting to work (11 percent), compared to other areas of the City, and have greater exposure to experiencing climate hazards during active commutes. Commute mode and travel time can further increase vulnerability and potential for greater impacts to individual health. For example, individuals who walk to work are at greater risk during heavy periods of rain or flooding than individuals who take transit.

Tree Canopy

In the City of Manhattan Beach, almost five percent of land has tree canopy, which is higher than 31 percent of other cities in California (PHASoCal, 2022). In urban areas, including Manhattan Beach, tree canopy can help mitigate increasing greenhouse gas emissions and climate change impacts. Tree canopy, especially along sidewalks, parks, trails, and bicycle paths, can also provide shade, cooling, and benefits to individual health and wellbeing. Areas with lower levels of tree canopy are more vulnerable to air pollution and wildfire smoke, as well as extreme heat impacts.

Park Access

In Manhattan Beach, 100 percent of residents live within a half-mile, or within a 10-minute walk, of a park or open space area (PHASoCal, 2022). Communities with low access to parks and open spaces are more vulnerable to certain climate impacts from extreme heat and air pollution. Parks can help reduce the effects of the urban heat island effect, providing an open, inexpensive, and natural cooling amenity for residents and visitors. This can be especially helpful for individuals that are low-income or don't have access to air conditioning and cooling centers.

Critical Infrastructure

The systems, buildings, and infrastructure of a community may also be vulnerable to climate change impacts. The following critical infrastructure and built assets in the City of Manhattan Beach are considered potentially vulnerable. The exposure of these assets to climate change hazards is discussed at a greater length under each hazard, below.

Emergency Response Facilities

Emergency response facilities are those facilities and infrastructure that are critical when responding to an emergency and include fire stations, police stations, emergency coordination centers, and evacuation routes. These facilities are shown on Figure 4-1, below. Evacuation routes and City-designated emergency shelter locations are shown on Figure 4-2.

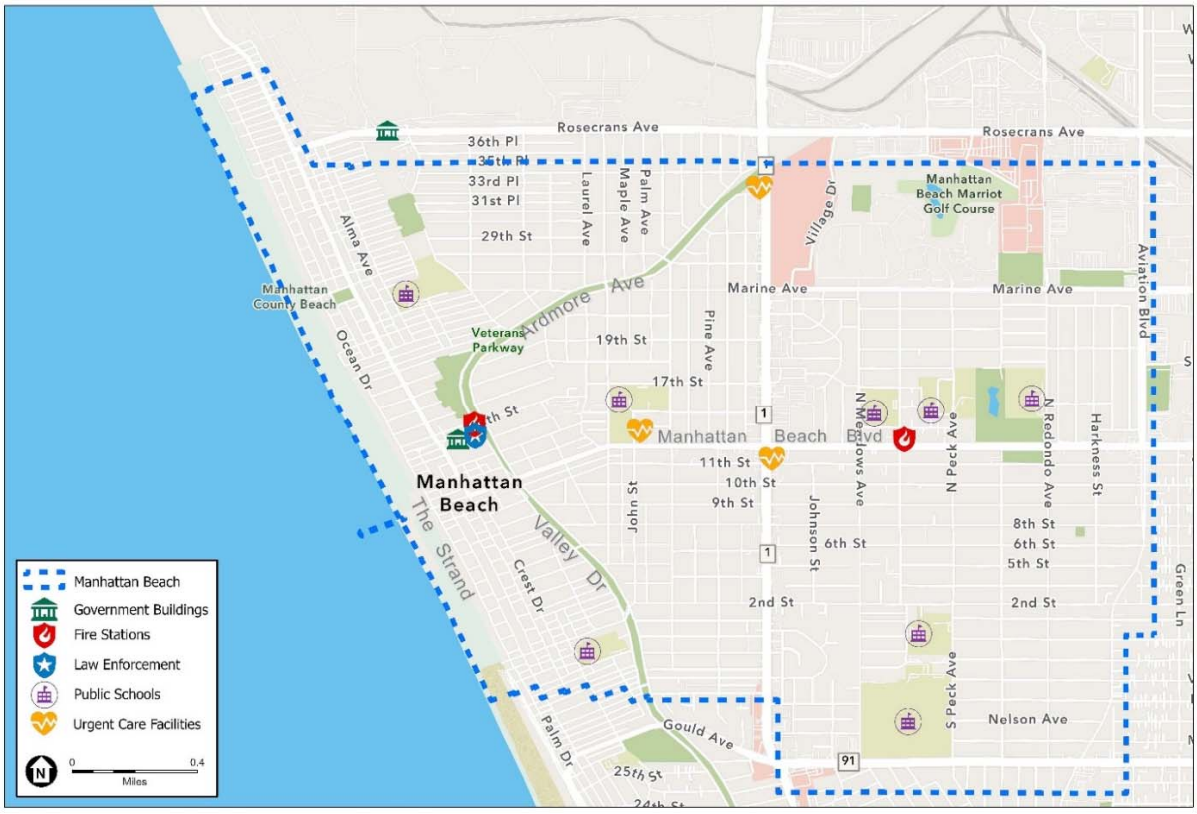


Figure 4-1. Emergency Response Facilities in Manhattan Beach

Source: UrbanFootprint, 2021; City of Manhattan Beach, 2021; ESA, 2024

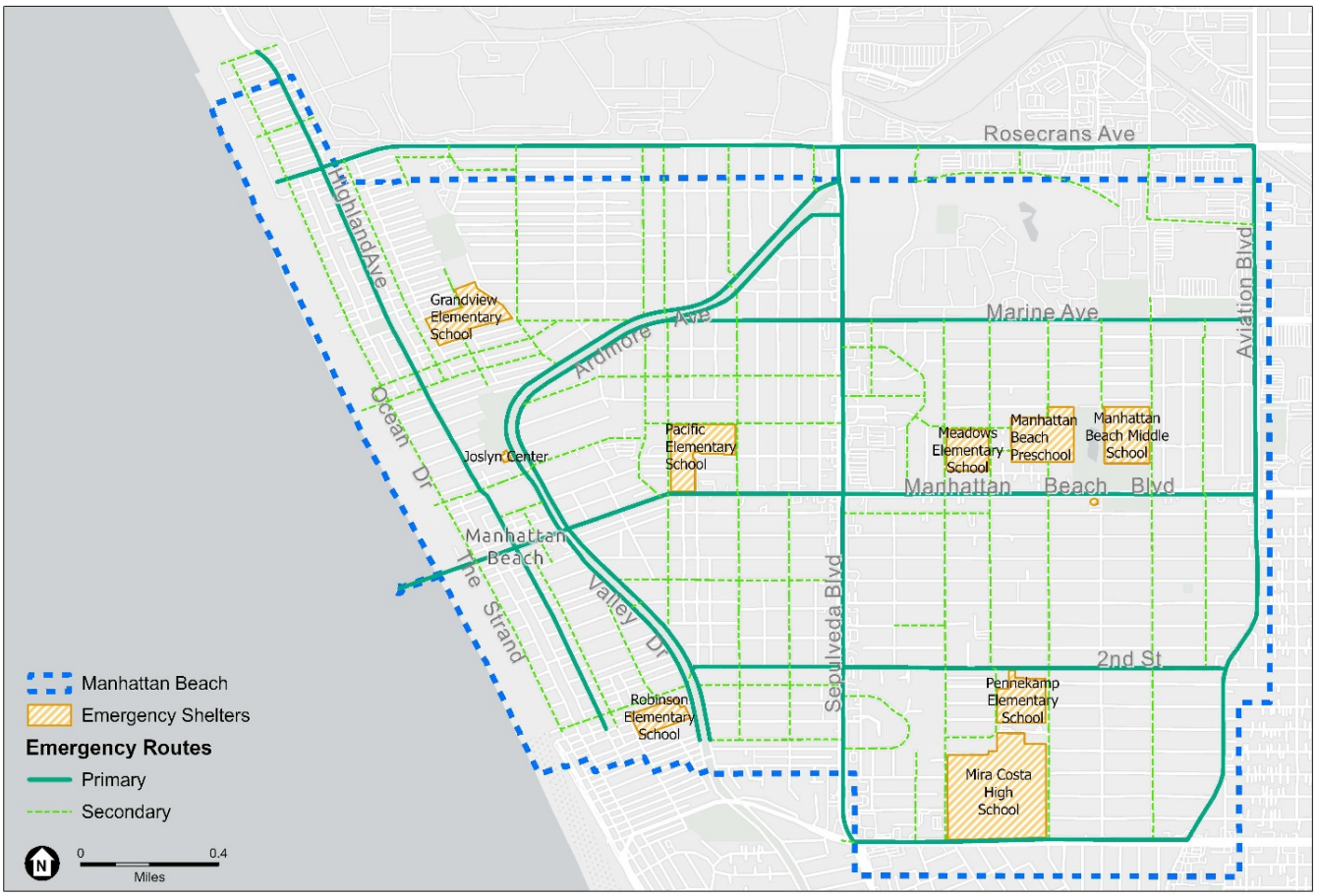


Figure 4-2. Evacuation Routes and Emergency Shelters in Manhattan Beach

Source: UrbanFootprint, 2021; City of Manhattan Beach, 2021; ESA, 2024

Other Critical Facilities

Critical facilities are those that are essential to the functioning of the City and include public buildings that may be used to coordinate human resources and equipment during hazard response and recovery. Such facilities include City buildings and offices, community buildings and libraries, wastewater treatment plants and sewer lines, public works yards, water infrastructure such as reservoirs and groundwater wells, hospitals, schools, and energy infrastructure. Other community assets that may be vulnerable to climate change impacts include parks, trees, beaches and beach facilities, and businesses.

Hazards of Concern

When asked about potential climate change hazards of most concern, local residents listed drought, impacts to air and water quality, an increase in extreme storms, and sea level rise. Residents are concerned about impacts to infrastructure and property values as well as impacts to public health and quality of life, especially for future generations.

These concerns are consistent with the science of climate change, which indicates that over the next several decades the City of Manhattan Beach can expect higher temperatures, worsening air quality, more extreme droughts, more extreme storms, and rising seas.

Extreme Heat

Forecast

Average maximum temperatures in the City of Manhattan Beach are expected to increase 5-10 degrees Fahrenheit by the end of the century (CalAdapt, 2025). Historically, the City of Manhattan Beach has experienced approximately four days of extreme heat[5] per year. The number of extreme heat days are expected to increase, up to 36 extreme heat days annually by the end of the century (CalAdapt, 2025). Across the region, heat waves are expected to occur more frequently and be more intense and long-lasting due to climate change (Hall et al., 2018). Additionally, observed decreases in summer clouds and fog along coastal communities is increasing risk for more frequent heat waves (Hulley et al., 2020).

Figure 4-3 illustrates the "urban heat island" effect, where buildings, roads, and urban infrastructure absorb and re-emit the sun's heat with more intensity than the natural landscape does. In urban areas where greenery is limited, this effect is amplified and results in higher daytime and nighttime temperatures relative to outlying areas. Warming and extreme heat in the City of Manhattan Beach may be exacerbated by the urban heat island effect and result in higher cooling demands.

Risk and Onset

Global temperatures are continuing to rise at a rapid rate and have had increasingly observable effects on the environment. The year 2023 was the warmest on record (since 1850) and the last 10 warmest years have all occurred within the last decade, since 2014 (NOAA, 2024). Scientists have a high level of confidence that temperatures will continue to rise for decades and that extreme heat days and heat waves will occur more frequently.

- **Certainty:** High
- **Timeframe:** 0-5 years
- **Secondary impacts:** Air pollution, wildfires, drought

[5] For Manhattan Beach, extreme heat days are defined as days when the maximum temperature rises above 90 degrees.

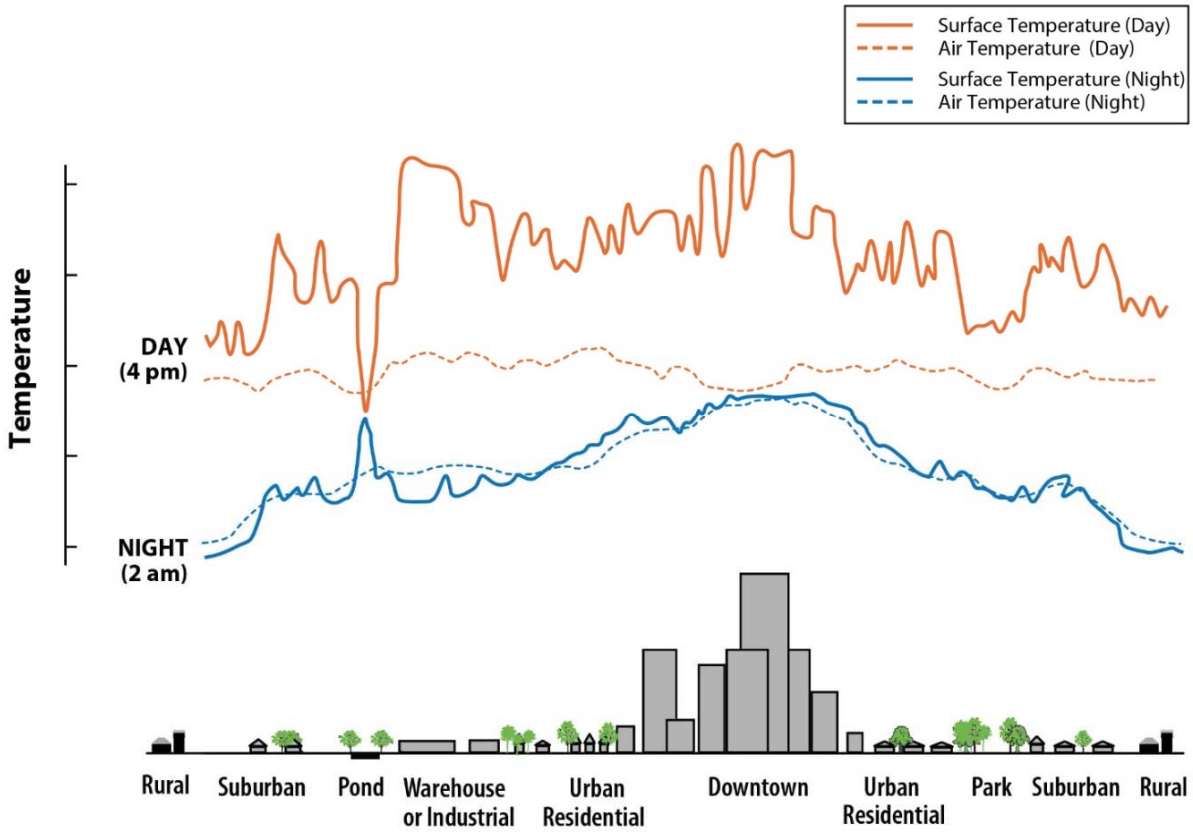


Figure 4-3. Urban Heat Island Effects

Source: USEPA, 2021

Impacts

Extreme heat poses one of the most significant health impacts of climate change, causing more deaths each year in the United States than other climate hazards of flooding, storming, and lightning combined (Hall et al., 2018). Increases in the number and intensity of extreme heat events are likely to result in public health impacts including heat related illnesses, death, and worsening of cardiovascular and respiratory conditions. Additionally, extreme heat can impact mental health by causing stress, aggression, and fatigue and by worsening existing mental health conditions. The 2006 heat wave in California killed over 600 people and resulted in 1,200 hospitalizations and 16,000 emergency department visits (CNAP, 2015). Extreme heat days also result in missed school and workdays due to heat related illnesses.

Extreme heat can indirectly impact health when there are power outages caused by stress on the electrical grid and increased electricity demand for air conditioning. Power outages put vulnerable populations such as the elderly and individuals with existing health conditions at further risk as they must go without medical devices, air conditioning, and refrigeration. Power outages can also result in traffic disruptions and resulting delays in emergency response.

Extreme heat may also result in higher energy costs to cool homes and over long periods may result in tree die-off and the loss of urban tree canopy and parks. The City of Manhattan Beach may experience additional stress

on public services and emergency response due to the influx of visitors coming to Manhattan Beach to escape smoke, heat, and wildfire impacts elsewhere.

Vulnerabilities

Vulnerable populations include individuals with chronic illnesses, children, elderly, unsheltered individuals, uninsured individuals, people with reduced mobility, outdoor workers, linguistically isolated households, and low-income households. Additionally, visitors and seasonal residents are particularly vulnerable to extreme heat as they may not be aware of the potential for negative impacts or of available resources to assist with cooling. Residents in coastal communities are not as acclimated to warmer temperatures and may not be adequately prepared for extreme heat, increasing their vulnerability for extreme heat impacts, including public health risk and stress on energy resources (LA County, 2021). Renters are also vulnerable to extreme heat as they are less likely to use or have access to air conditioning in their homes. Neighborhoods in the City with fewer trees will be more likely to experience the urban heat island effect. As shown in Figure 4-4, the western areas of the City have less tree canopy and will be more vulnerable to the impacts of extreme heat.

Figure 4-4. Tree Canopy In Manhattan Beach

Source: PHASoCal, 2022; ESA, 2024

Energy infrastructure experiences stress during periods of high demand which can impact the regional energy grid and result in power outages. Critical infrastructure such as emergency response facilities, healthcare facilities, cooling centers, and community centers may be vulnerable to extreme heat especially if they do not have backup sources of power. Roads can also be damaged by extreme heat due to softening and melting of asphalt, especially in areas with high traffic volumes. Emergency response facilities are unable to maintain operations if the connections to power or to transportation routes between facilities and areas served are damaged or disrupted. Higher average temperatures and long heat waves can also impact regional water sources by increasing demand for water and increasing evaporation losses.

Current Adaptive Capacity

Positive factors

- All Manhattan Beach residents live within walking distance of a park, beach, or open space which can provide relief during extreme heat events.
- The City of Manhattan Beach energy conservation programs will help the City be more resilient to power outages.
- The City has a Tree Ordinance and Urban Forestry Program aimed at tree preservation and expansion which can aid with localized cooling efforts.
- The City has emergency power sources at the Public Safety Facility, Fire Station Two, and City Hall.
- The City of Manhattan Beach has a designated cooling center (Joslyn Community Center).

Negative factors

- The majority of coastal residences within Manhattan Beach do not have air conditioning.
- Census tracts in the western portion of the City have a relatively low level of tree canopy. Trees can aid with air pollution removal, creating a localized reduction in air pollution impacts.
- The City currently has no energy storage at municipal facilities for power outages.
- The City does not have emergency transportation in the event of extreme heat events.

Air Pollution

Forecast

Due to the City's proximity to highly congested freeways and industrial land uses such as the Chevron refinery and LAX, the City of Manhattan Beach already experiences high levels of air pollution. The City is in the top 40 percent of polluted cities with respect to particulate matter (PM), including diesel PM and PM 2.5 pollution (OEHHA, 2021). Climate change is expected to increase ground-level ozone concentrations and PM, which will exacerbate existing pollution burden in the City (CNRA, 2018; Park et al, 2020). Regional wildfires are expected to increase in frequency and severity in the coming decades. While wildfires that occur in Southern California are generally not a direct threat to Manhattan Beach, the City's air quality will also be worsened by their far-ranging smoke impacts (CNRA, 2018). Additionally, changes in precipitation and temperatures are expected to increase pollen and airborne allergens which may increase allergic reactions and asthma attacks.

Impacts

The City of Manhattan Beach already experiences high levels of pollution which will be exacerbated by worsening air quality. Existing health conditions such as asthma and cardiovascular disease may be worsened by poor air quality. Poor air quality impacts the health of outdoor workers and others who spend long periods of time outside.

When wildfires are extreme, as occurred in the Fall of 2020, poor air quality may require individuals to "shelter in place" in their homes which can negatively impact physical and mental health, and can cause missed days of work and school. Additionally, Manhattan Beach may also experience secondary impacts of people coming to the City's beaches to escape smoke, heat, and wildfire impacts from elsewhere.

Risk and Onset

The certainty of worsening air pollution will depend heavily on whether local and regional emissions remain high in the future as well as other factors such as temperature, wind, and the extent of wildfires.

- **Certainty:** Low, dependent on local air quality
- **Timeframe:** 0-5 years
- **Secondary impacts:** Human health impacts

Cascading Impacts: Pandemic and Wildfires in Fall 2020

Rising temperatures can increase air pollution levels and the risk for wildfires to occur. These impacts can intersect with other social and environmental events, such as the novel coronavirus disease (COVID-19) that evolved to a pandemic in 2020. The Fall of 2020 presented numerous challenges for communities in California due to the simultaneous occurrence of the COVID-19 pandemic and the unprecedented wildfire season, the worst on record. These combined events illustrate the interconnected social, economic, and public health impacts of climate change and the potential for climate change to exacerbate existing inequalities and impacts. Months into the pandemic, the impacts of respiratory disease and economic and societal shifts were felt disproportionately by individuals with underlying health conditions, the elderly, children, outdoor workers, housing burdened and low-income families, and small business owners.

While Manhattan Beach's coastal climate generally keeps temperatures lower and air quality better than in other areas in Los Angeles, during the Fall of 2020 heat waves overlapped with an unprecedented wildfire season in California which led to record-breaking temperatures and unhealthy air quality in the Los Angeles region. The COVID-19 pandemic caused financial hardship for many families and forced many people to spend the majority of time within their own home resulting in social isolation. The combination of these events forced individuals to "shelter in place" due to poor air quality. As businesses, schools, and workplaces were closed, people's access to locations with air conditioning and clean air was reduced, exposing residents to greater exposure to illness from extreme heat and poor air quality. Smoke from the wildfires significantly reduced the amount of time people could spend outside, worsening the social isolation and associated mental health impacts created by the pandemic.

Many small businesses were hit hard economically by the pandemic. The smoke from the wildfires further reduced the number of visitors to Manhattan Beach, resulting in additional hardships for small tourism-dependent businesses.

As climate conditions become more intense, there is greater potential for distinct hazards to occur more frequently and at the same time, such as wildfires and droughts. This can amplify effects on vulnerable populations, safety, public health and emergency response, and economic activity. Recognizing the links and cascading impacts can help build preparedness to respond to multiple hazards.

Vulnerabilities

Communities and individuals who live in census tracts with poor air quality are particularly sensitive to climate change effects. The City as a whole has high levels of PM 2.5 pollution. As shown in Figure 4-5, census tracts in the north and east of the City already experience relatively high levels of diesel PM pollution which makes them more vulnerable to air quality impacts from climate change. Trees reduce air pollution by intercepting airborne particles and through the uptake of air pollutants through the leaf stomata. As a result, in areas with increased tree cover air quality is improved relative to areas with fewer trees, such as census tracts in the western portion of the City. Individuals living in park-poor neighborhoods or areas without trees are more vulnerable to the impacts of poor air quality as they do not experience the air quality benefits that trees, greenery, and open space

can provide. Populations that are particularly vulnerable to the impacts of poor air quality include children, elderly, outdoor workers, individuals with existing health conditions such as asthma, individuals without access to healthcare, and communities with low birth weights.

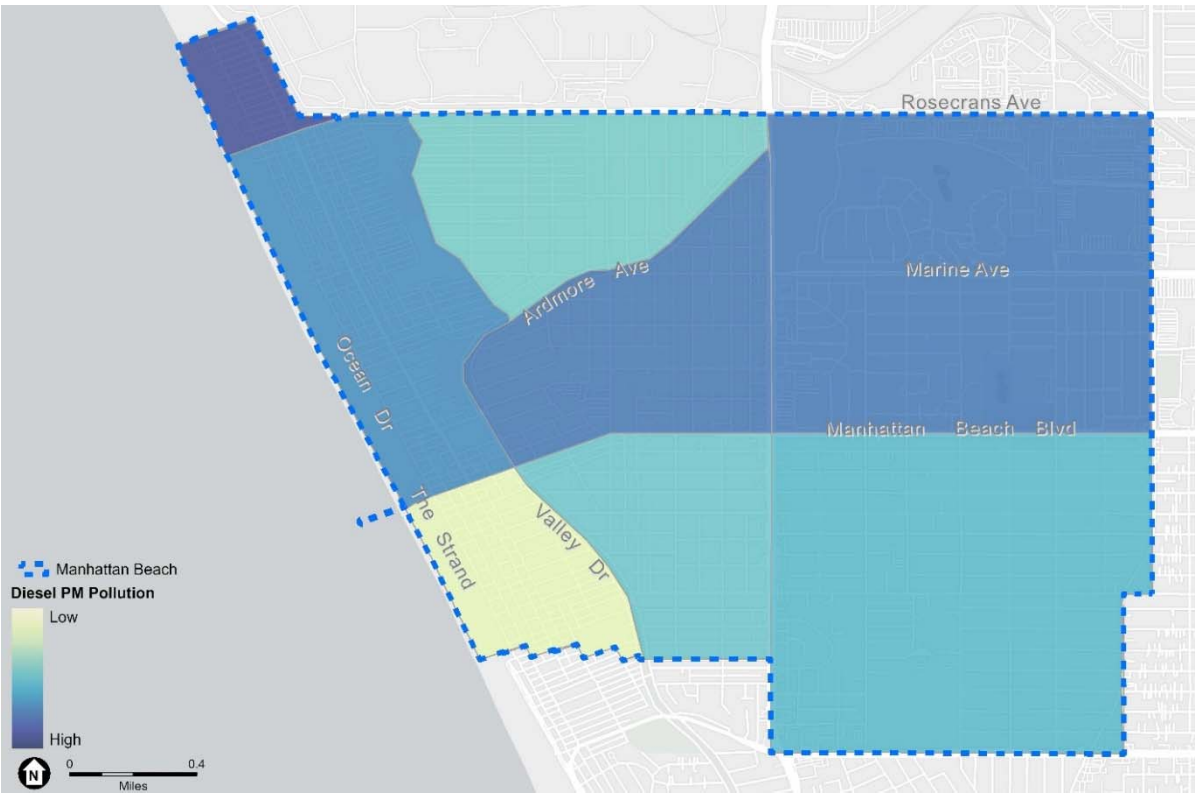


Figure 4-5. Relative Diesel Particulate Matter Pollution in Manhattan Beach
Source: OEHHA, 2021; ESA, 2024

Adaptive Capacity

Positive factors

- The City has a Tree Ordinance and Urban Forestry Program aimed at tree preservation and expansion.
- The City has a designated cooling center (Joslyn Community Center) where individuals can find relief from poor air quality and extreme heat, particularly if they do not have cooling or air conditioning and purification at home.

Negative factors

- Almost five percent of land in the City has tree canopy, which is lower than 68 percent of other cities in the state (PHASoCal, 2022).
- Census tracts in the southwestern portion of the City, namely renters and those without air conditioning, are especially vulnerable in extreme heat events due to the overlap of poor air quality and a particularly low level of tree canopy.
- Data is not available for households that have access to air conditioning at home. When extreme heat events and poor air quality overlap, households without air conditioning will be at a higher risk for air pollution impacts.
- The City does not have emergency transportation in the event of poor air quality.

Sea Level Rise

This section is informed by the Sea Level Rise Risk, Hazards, and Vulnerability Assessment (City of Manhattan Beach, 2021a) and the City of Manhattan Beach Sea Level Rise Adaptation Plan (City of Manhattan Beach, 2021b).

Risk and Onset

Sea levels have been rising at an accelerated rate in recent years. Average sea level could rise by approximately 1.9 feet by 2050 and 6.8 feet by 2100.

- **Certainty:** High
- **Timeframe:** Near to long term (10-100 years)
- **Secondary impacts:** Increased inland flooding, groundwater impacts

Forecast

Sea levels in Manhattan Beach have increased by about six inches in the last 100 years, with about 1.3 inches of that increase occurring over the past 20 years. However, the rate of sea level rise is expected to accelerate even faster in the coming decades with potentially 1.9 feet of sea level rise by 2050 and 6.8 feet by 2100 (City of Manhattan Beach, 2021a). Sea level rise not only increases typical tidal water levels but also storm water levels. The frequency and intensity of coastal storms is expected to increase in the future with climate change (City of Manhattan Beach 2021a).[6] Figure 4-6 shows conceptually how sea level rise will affect daily tidal inundation as well as the severity of flooding from future coastal storms. Figure 4-7 depicts how daily tidal inundation levels may change with varying levels of sea level rise.

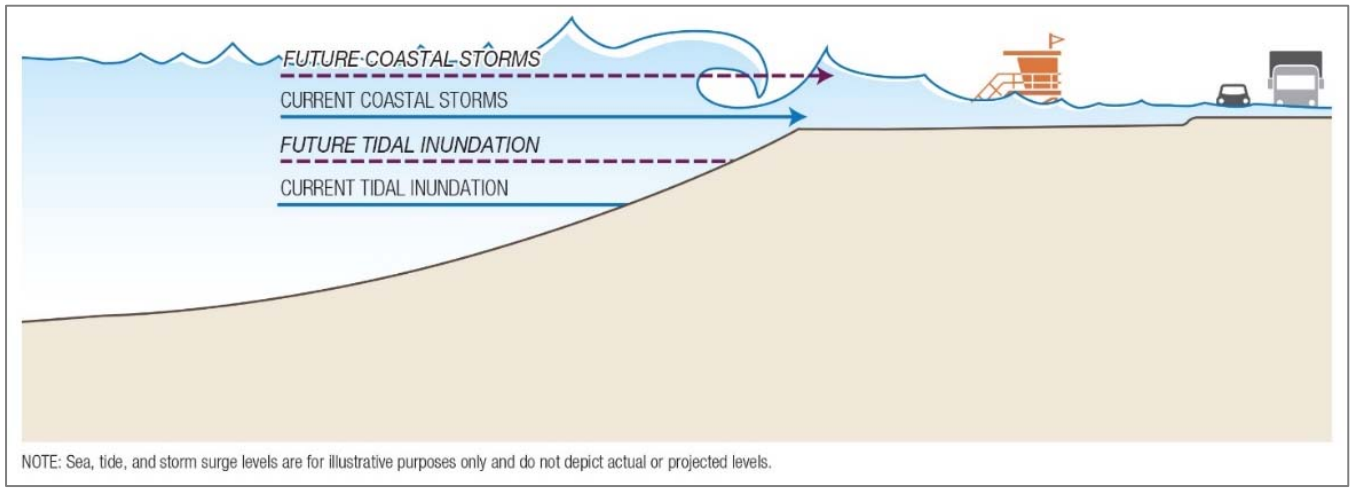


Figure 4-6. Conceptual Shoreline Cross-Section Showing Tidal Inundation and Coastal Storm Flood Hazards

Source: City of Manhattan Beach, 2021a

[6] **Coastal storm events** impact the shoreline through higher water levels due to storm surge, large waves, and/or elevated river flows, all of which are commonly associated with low-pressure weather systems. Planning and analysis often occur for the "100-year storm," which is the storm estimated to have a one percent chance of occurring in any given year.

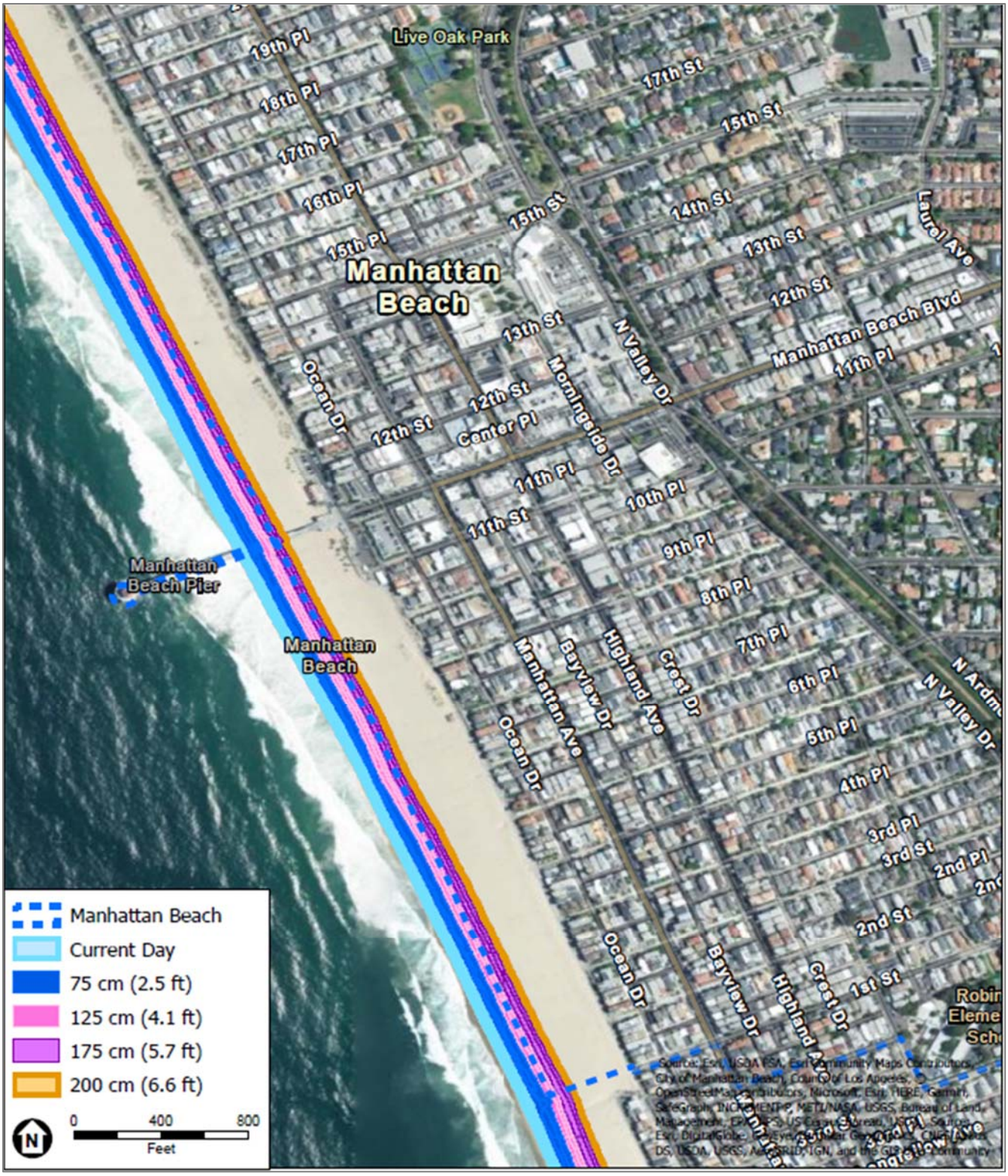


Figure 4-7. Tidal Inundation with Sea Level Rise - Current and Future Scenarios (2.5 ft to 6.6 ft)

Source: USGS, 2018; FEMA, 2021; ESRI, 2021; ESA, 2021

Impacts

Sea level rise is expected to create a permanent increase in ocean water levels that will shift the water's edge landward. This will result in a narrower beach and an increase in beach erosion. Additionally, the combination of sea level rise and coastal storms will result in more frequent and intense coastal flooding. Stormwater infrastructure in coastal cities is usually designed to drain rainfall based on a fixed maximum ocean water level (e.g., the design usually assumes sea water levels are low enough to allow full drainage from the pipes). However, the co-occurrence of extreme rainfall and high ocean water levels can lead to increased stormwater flood risk. With rising sea levels, the City of Manhattan Beach may experience increased inland flooding from rainfall events due to the blockage of the outfalls by higher-than-normal coastal water levels moving up into the storm drain system (See Figure 4-8 which shows areas at risk of stormwater flooding). In this situation, reduced outflow capacity at the ocean outlet may propagate through the system leading to flooding inland. Under existing conditions, the City could experience widespread inland flooding with a 50 or 100-year rainfall event. In the future, the magnitude and frequency of inland flooding is expected to worsen due to the co-occurrence of extreme rainfall events and rising sea levels (City of Manhattan Beach 2021a).

Rising sea levels can impact coastal groundwater both by increasing groundwater levels and by the intrusion of salt water into coastal aquifers. Higher sea levels can cause inland intrusion of denser salt water, which can raise unconfined salt water tables and force overlying freshwater to rise up. The water table can rise above the ground surface, flooding low-lying areas, or can infiltrate and damage subsurface infrastructure, such as basements, building foundations, and gas lines. Rising sea levels and water tables can also contribute to more surface pooling, which creates more suitable conditions for vectors to thrive and causing impacts to public health. Additionally, the intrusion of salt water may increase the salinity of the West Coast Groundwater Basin, which is a water source for Manhattan Beach. Salt water intrusion is currently addressed by the West Coast Basin Barrier Project (City of Manhattan Beach, 2021a).

Vulnerabilities

Sea level rise is not expected to directly impact any homes, roads, or major infrastructure in the City before 2100. However, the combined impacts of sea level rise and extreme rainfall could increase coastal and inland flooding of roads, residences, and evacuation routes. Populations that are vulnerable to coastal hazards include older individuals and individuals with reduced mobility as they may be less able to evacuate in the event of flooding. Visitors and seasonal may have limited access to information about climate impacts and policies, including evacuation routes. Additionally, nearby beaches in LA County are expected to lose their width before Manhattan Beach does, which may result in an influx of visitors from surrounding areas. Low-income households, renters, rent-burdened households, and single-heads of households are less likely to have access to financial resources and forms of reliable transportation which are critical when evacuating from flood hazards or rebuilding following a flood event. Unhoused neighbors are particularly exposed to flood events and may have difficulty evacuating or relocating in the event of a flood. Linguistically isolated households may also be vulnerable in a flood event as they may face more difficulty accessing timely information about evacuation.

Physical vulnerabilities to sea level rise include the beach and beach amenities. Beach erosion will result in a narrower beach over time, which will result in impacts to biodiversity and ecological function. Additionally, amenities along the beach are expected to become vulnerable to daily wave run-up and tidal inundation. The restrooms and maintenance building at Rosecrans Ave are already vulnerable to wave run-up during a 100-

year storm event. With 6.6 feet of sea level rise, daily wave run-up is expected to reach volleyball courts closest to the ocean. The Marvin Braude Trail could become impacted by 4.9 feet of sea level rise. Restrooms at the Pier and North Manhattan Beach could also experience storm inundation. The North Manhattan Beach food stand and beach rental building is already vulnerable to wave run-up during a 100-year storm and will become more vulnerable as sea levels rise. The Lower Pier Parking Lot is expected to be vulnerable to wave run-up during a 100-year storm event with 4.9 feet of sea level rise. While the Manhattan Beach Pier is designed to be in the storm hazard zone, over time the Pier and the assets at the Pier, such as the Roundhouse Aquarium, will experience more frequent wave overtopping (City of Manhattan Beach, 2021a).

The City's storm drain system is currently vulnerable to inland flooding during a 25-year rainfall event, and it will only become more vulnerable as sea levels rise. Additionally, storm drain outfalls will become vulnerable to sand blockage and beach erosion as sea levels rise. With 6.6 feet of sea level rise, a 100-year storm could reach the South Bay Cities' main sewer trunk line, leading to leaks and/or pipe failure.

Adaptive Capacity

Positive Factors

- The City has developed a Sea Level Rise Vulnerability Assessment and Adaptation Plan that identifies the City's vulnerabilities and includes strategies to increase the City's resilience to sea level rise.
- The Manhattan Beach Dune Restoration Project began pilot dune restoration along 0.6 miles of beach near Bruce's Beach. This will increase beach resiliency to sea level rise and coastal storms while encouraging increased education and engagement regarding sea level rise adaptation measures.
- The beach itself has a high adaptive capacity as it is a wide beach that will remain in place even as it becomes narrower. Dune restoration can increase the adaptive capacity of the beach.
- The Marvin Braude Trail and parking lots would have a high adaptive capacity as they can quickly return to normal functioning after a flood event.
- The West Coast Basin Barrier Project injects recycled water into the groundwater basin to prevent salt water intrusion into the two City of Manhattan Beach groundwater wells.

Negative factors

- The City's storm drain system has a low adaptive capacity as increasing the capacity would require replacing the pipes, which would be an extensive undertaking.
- The South Bay Cities' sewer main line has a low adaptive capacity as rerouting the line out of the coastal area would be an extensive undertaking and would require additional pump stations.
- Facilities such as restrooms and the food stand have a low adaptive capacity and would need to be relocated to be out of harm's way, which could be difficult due to limited available space and potential financial implications.

Extreme Storms and Stormwater Flooding

Forecast

Inland Manhattan Beach is located in an area designated by FEMA to be an "Area of Minimal Flood Hazard." Under existing conditions, during a 50 or 100-year storm, widespread flooding can occur in low-lying areas of the City. Figure 4-8 shows where stormwater flooding has occurred in the past. Climate change is expected to increase the frequency, intensity, and duration of extreme precipitation events, which is likely to increase this type of flooding (Hall et al, 2018). By the late 21st century, total rainfall on the wettest day of year may increase by as much as 26 percent under the high emissions scenario (Cal-Adapt, 2021). The frequency and severity of atmospheric river events (narrow bands of concentrated moisture that deliver intense precipitation over several days) are projected to increase in the City of Manhattan Beach. Additionally, the impacts of stormwater flooding will be compounded by rising sea levels. With higher coastal water levels, extreme rainfall events will likely result in water backing up into the stormwater system and flooding through maintenance holes as the stormwater system cannot move water into the ocean quickly enough.

Risk and Onset

Manhattan Beach is already experiencing the effects of extreme precipitation in the form of atmospheric rivers, narrow bands of concentrated moisture that deliver intense precipitation over several days. These are expected to increase in frequency and severity.

- **Certainty:** High
- **Timeframe:** Mid to long term (10-50 years)
- **Secondary impacts:** None identified

Impacts

An increase in extreme storms and precipitation can result in flooding of streets, roads, and low-lying areas of the City due to the diminished function of the stormwater drainage system. Flooding can impact important roadways and evacuation routes, which in turn can impact emergency evacuation routes and emergency response times. Flooding of transportation routes may result in neighborhoods or households becoming stranded, unable to evacuate or access critical resources, or be reached by emergency response. Additional surface water on roads can also lead to hazardous driving conditions. More frequent and severe flooding could result in residential and commercial property damage, population displacement, and injuries. Additionally, flooding can result in a long-term impact of increased mold, which can result in respiratory health issues.

If critical facilities such as emergency shelters, emergency response centers, or healthcare facilities are located below grade or have infrastructure located below grade, they could be impacted by severe storms and flooding. Extreme storms and flooding also have the potential to impact power supplies that are needed to deliver water, power, and other critical needs to residences and critical infrastructure such as hospitals and emergency response centers.

Vulnerabilities

Vulnerable populations include individuals without automobile or transit access, linguistically isolated individuals, young children, and older adults, as they may be less able to evacuate in the event of a flood. Additionally, low-income households, renters, rent-burdened households, and single-heads of households are less likely to have access to financial resources and forms of reliable transportation, which are critical when evacuating from flood hazards or rebuilding following a flood event. Unhoused neighbors are particularly exposed to flood events and may have difficulty evacuating or relocating in the event of a flood.

The City's storm drain infrastructure is vulnerable to increases in precipitation. Without considering the compounding impact of sea level rise, the stormwater drainage system is likely to be overwhelmed under 50-year and 100-year storms resulting in widespread flooding. If high sea levels coincide with a 50 or 100-year storm, flooding could be even more severe.

Transportation and evacuation routes such as Manhattan Beach Blvd, Marine Ave, Highland Ave, and Manhattan Ave are located in areas that are vulnerable to stormwater flooding. Residences and businesses located in low-lying areas are also vulnerable to stormwater flooding. Robinson Elementary School and Grandview Elementary School, which are used as emergency shelters, are also vulnerable to stormwater flooding.

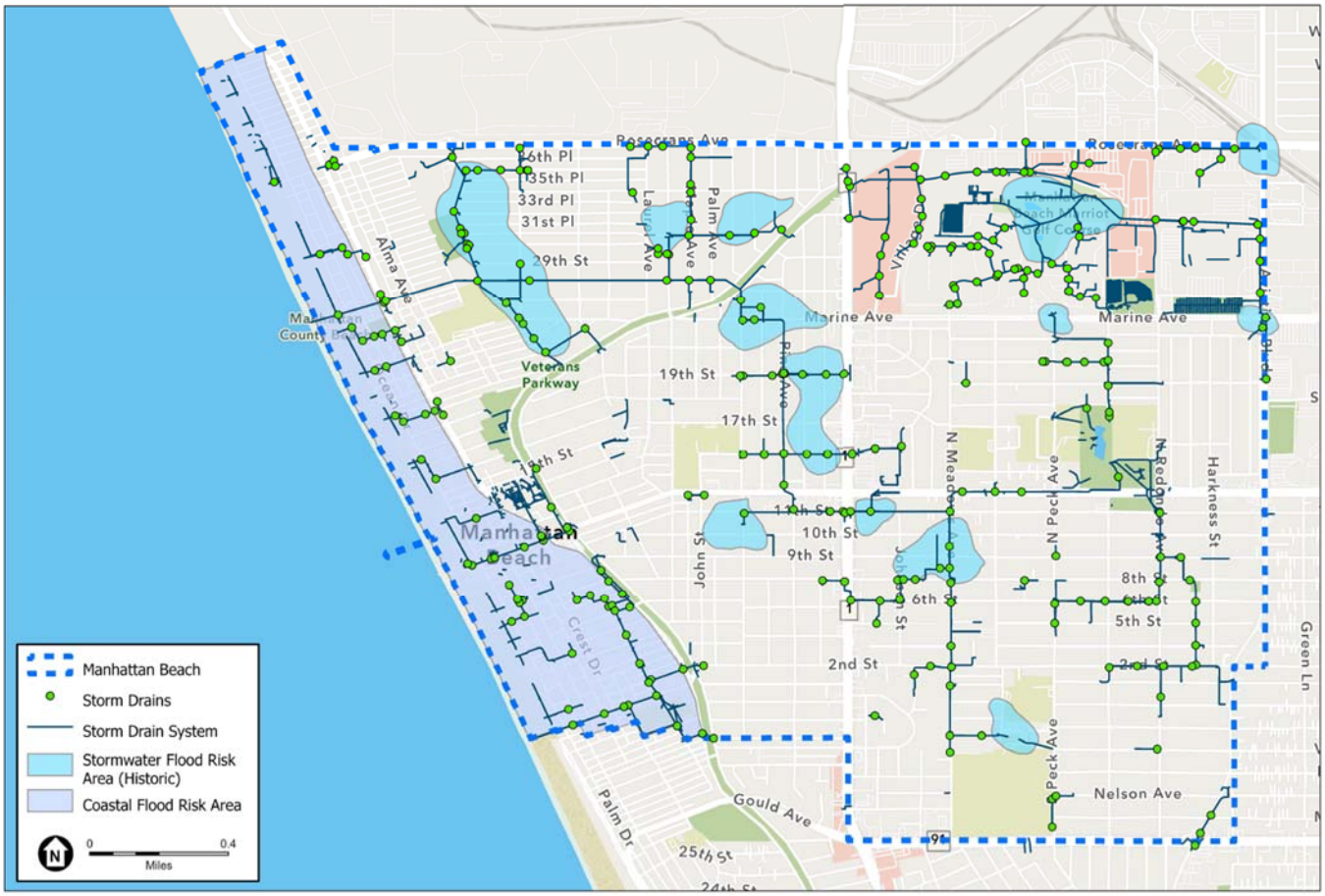


Figure 4-8. Stormwater Flooding

Source: Manhattan Beach, 2021; ESRI, 2021; ESA, 2021

Adaptive Capacity

Positive Factors

- The City is partnering with neighboring cities to form the Beach Cities Watershed Group to develop stormwater pollution prevention measures.
- The City has a Stormwater Pollution Prevention Ordinance.

Negative factors

- As identified in the SLR VA, the stormwater system can pass a 25-year rainfall event but is not prepared for a 50-year or 100-year rainfall event.
- The amount of impervious surfaces in the City (58 percent, which places the City in the top eight percent of impervious cities in the state) will make the City more vulnerable to stormwater flooding (PHASoCal, 2022).
- The lack of transit access within the City will make evacuation from flooding events more difficult for individuals without access to a car.

Drought

Forecast

Southern California has experienced periods of extremely dry conditions in recent years. **Figure 4-9** depicts drought conditions in LA County over time from 2000-2024. The darkest red color represents "exceptional drought" conditions whereas the yellow color reflects periods considered to be "abnormally dry". Drought is affected by the quantity and distribution of precipitation as well as temperature. When total annual precipitation comes in fewer, more concentrated events, reservoirs and groundwater aquifers become saturated and are unable to store additional water. Water is then lost to stormwater runoff and is not retained in the watershed in the way it would be with more evenly distributed precipitation. Warmer temperatures also increase snowmelt, soil evaporation, and evapotranspiration and lead to drier soils and vegetation and overall drier seasonal conditions (CNRA, 2018). California has a variable climate setting with significant variation year to year in precipitation levels. In the future, more precipitation is expected to come through extreme "atmospheric river" events, which will reduce the amount of water stored in the watershed. Additionally, warmer temperatures are expected to increase seasonal dryness. Overall, climate change is expected to increase the intensity and duration of future droughts (CNRA, 2018). More severe and prolonged droughts within Southern California could have significant impacts on regional water supply. In particular, climate change is expected to reduce snowpack in the Sierra Nevada and water supply in the Colorado River Basin which supply a significant

Risk and Onset

Southern California has experienced prolonged, severe droughts in recent years, which have triggered water restrictions. These periods of drought are expected to increase in frequency and severity.

- **Certainty:** Medium to high
- **Timeframe:** Long (50-100 years)
- **Secondary impacts:** Wildfire and air pollution

amount of water in Southern California, placing pressure on groundwater resources as well as imported water supply.

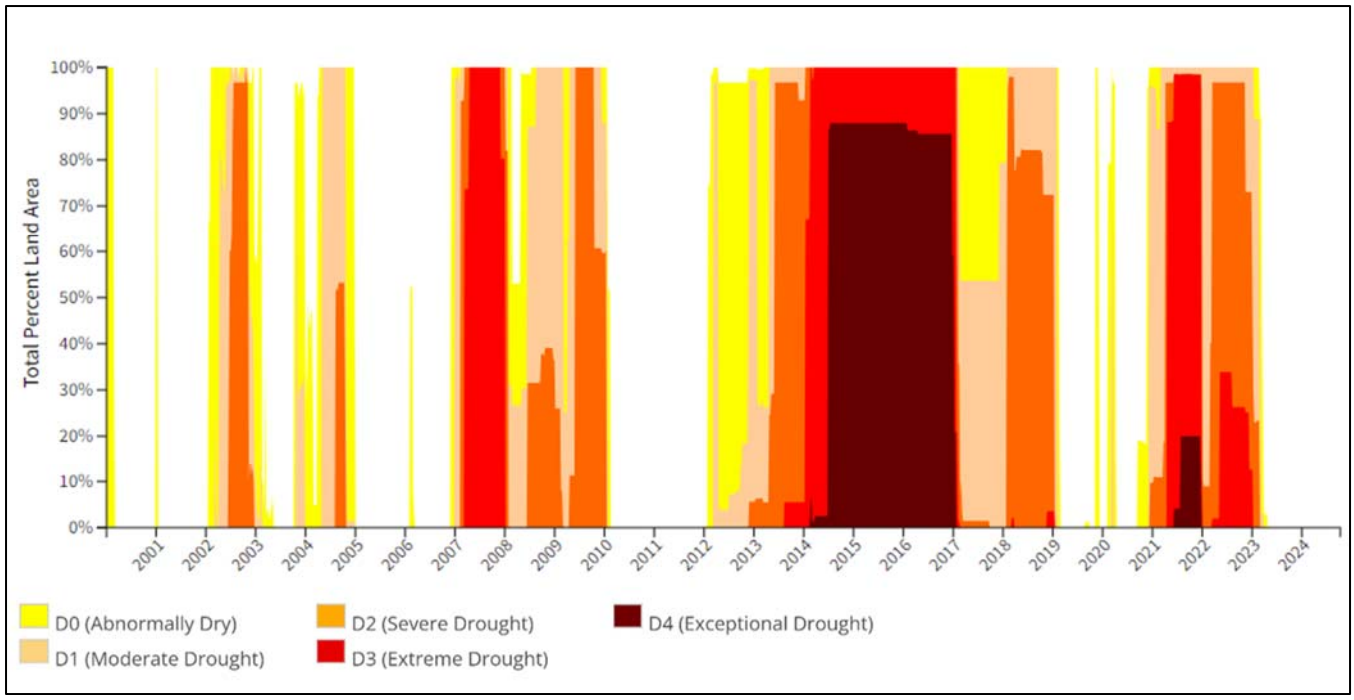


Figure 4-9: Drought Conditions in LA County 2000-2023

Source: USDM, 2024

Impacts

Changes in snowpack levels and increases in seasonal dryness could have significant impacts on regional water supply. The City of Manhattan Beach has historically relied on both groundwater and imported surface water supplies, provided by the West Basin Municipal Water District (WBMWD) through a water connection from the Metropolitan Water District of Southern California (MWD). Groundwater is extracted from the West Coast Basin while imported water is sourced from the Colorado River and the State Water Project systems. The City also purchases recycled water from WBMWD for irrigation. As of 2024, approximately 80 percent of the City's water is supplied from MWD surface water, 17 percent from groundwater, and three percent from recycled water (City of Manhattan Beach, 2024). Severe and long-lasting drought conditions can affect available water supplies, as well as the resilience of the water system to recover.

In April 2022, drought led the MWD to declare a Water Shortage Emergency Conservation for the State Water Project (SWP), requiring member agencies dependent on the SWP to cut water immediately by June 2022. The declaration continued through March 2023, after winter storms helped alleviate water shortage conditions. Although the City was not affected by this water shortage as it does not depend on the SWP, it is essential to note this first time that a Tier 1 water shortage was declared at Lake Mead, the source of MWD's Colorado River water. In the event of a Tier 2 declaration, the State of California would experience its first water allocation cutbacks, potentially affecting the City. Intensification of future droughts could result in more water restrictions, water price increases, and water quality impacts. Water supply shortages could be compounded by rising sea levels impacting groundwater resources.

Increases in the frequency and severity of drought are likely to impact water resources available for open spaces and parks, resulting in dry soils, dry vegetation, and loss of some species that are not drought tolerant. Drought could result in loss of urban tree canopy and overall damage to local parks. Impacts on vegetation in parks and open spaces may also result in indirect impacts to wildlife. Regionally, stress on water supply may impact agricultural yields and result in higher food prices. Increases in the severity and length of seasonal dryness and periods of drought are likely to increase the severity of regional wildfires. While Manhattan Beach is not directly threatened by wildland fires, regional wildfires can result in poor air quality in the City.

Under extreme conditions, drought can impact paving materials, resulting in cracking and warping of paving materials. The loss of water storage and water supply can also reduce hydroelectric generation, which is a significant source of power in California, leading to grid instability and increased reliance on fossil fuels to meet peak energy demand.

Vulnerable Assets

Vulnerable populations include low-income households who will be disproportionately affected by increases in water prices. Additionally, individuals who are sensitive to air pollution including outdoor workers and those with chronic illnesses are indirectly impacted by drought when it contributes to an increase in the frequency and severity of regional wildfires, causing more smoke and bad air quality days.

Physical assets in the City that are vulnerable to drought include parks and urban trees, water supply infrastructure, and City-owned groundwater wells.

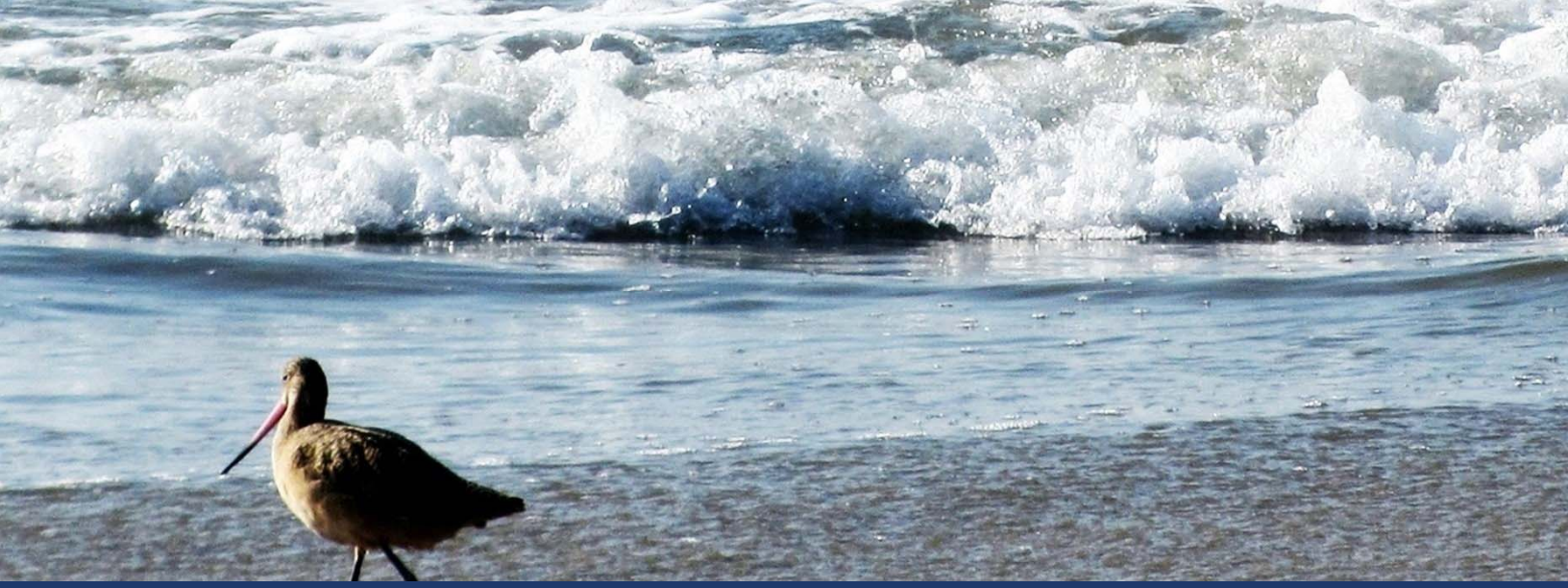
Adaptive Capacity

Positive factors

- The City's primary water source, Metropolitan Water District (MWD), considers drought and climate change in water planning efforts including the Urban Water Management Plan, Integrated Water Resources Plan, and Water Surplus and Drought Management Plan.
- The City's wholesale water supplier, West Basin Municipal Water District (WBMWD), has considered the impacts of drought and climate change in its most recent Urban Water Management Plan (WBMWD, 2021).
- The MWD has a Water Shortage Contingency Plan, which includes demand reduction measures and supply augmentation actions for low water years.
- The City's Permanent Water Conservation Requirements and water rebate programs through WBMWD will make the City more prepared for water restrictions and supply impacts.

Negative factors

- Planning by the City is still in early stages of considering the impacts of climate change on water supply (City of Manhattan Beach, 2017).



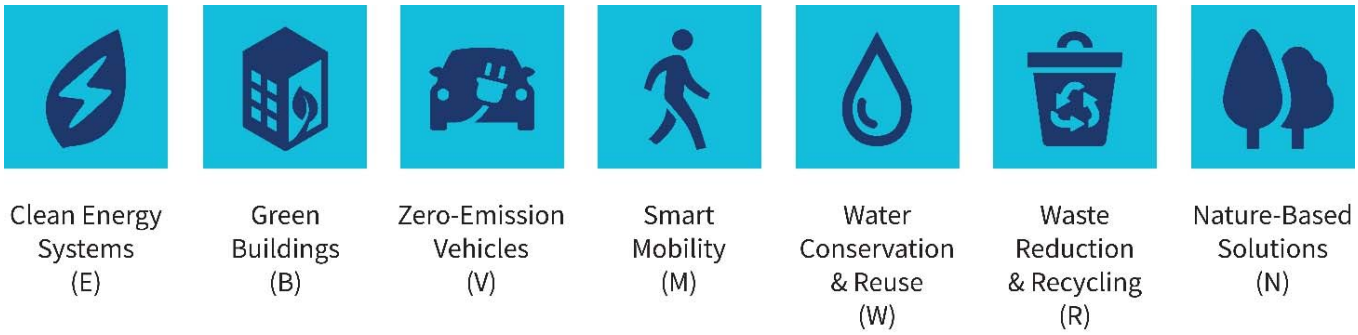
CHAPTER 5

Strategies and Actions to Reduce Emissions

While state policies and regulations contribute greatly to reducing GHG emissions, local measures are critical to the City's ability to meet its 2030 emission reduction target and its longer-term carbon neutral goal. This chapter describes the actions the City can take across a variety of strategies related to energy, transportation, solid waste, and natural resources. These include partnerships, outreach campaigns, incentives, zoning changes, ordinances, infrastructure investments, changes in local government operations, and other actions organized under the following groups of strategies:

- Clean Energy Systems (E)
- Green Buildings (B)
- Zero-Emission Vehicles (V)
- Smart Mobility (M)
- Water Conservation and Reuse (W)
- Waste Reduction and Recycling (R)
- Nature-based Solutions (N)

Many GHG reduction strategies result in cost savings to residents, businesses, and the City government. These savings are achieved through participation in programs aimed at increasing energy efficiency, water efficiency, use of public transportation, and utilization of renewable energy sources. Increased energy and water efficiency provides cost savings in the form of lower utility bills while use of public transportation can reduce costs associated with gasoline use and vehicle maintenance. Renewable energy generation would also provide cost savings to residents and business owners within the City, as these buildings would not need to purchase as much electricity from utility providers. While state measures are critical to meet the City's emission reduction goals, local programs and policies, as well as choices made by the City's residents and businesses, will determine the City's ability to achieve its emissions reduction target for 2030 and its longer-term carbon neutral goal. This chapter covers recommended strategies and actions for reducing GHG emissions, organized into seven major categories:



Through locally-implemented measures, described in more detail in the following sections, the City of Manhattan Beach anticipates annual emissions reductions of 105,418 $MTCO_2e$ by the year 2030, as shown in Table 5-1. Combined with state measures, local measures will enable the City of Manhattan Beach to reduce its total community GHG emissions to approximately 183,243 $MTCO_2e$ in the year 2030, as indicated in Table 5-2. This reduction from local measures, when combined with State measures, would reduce emissions by approximately 52 percent from 2005 levels, would enable the City to exceed its 2030 target, and would put the City on a solid path to attain carbon neutrality by 2045.

Table 5-1 Annual GHG Reductions from Local Measures by 2030

MEASURE	2030 ANNUAL REDUCTIONS ($MTCO_2E$/YEAR)
Clean Energy (E)	
E1: Procure Zero-Carbon Electricity	36,767
E2: Increase Local Solar Energy Generation	Not Quantified
E3: Develop Energy Storage/Microgrids	Not Quantified
Green Buildings (B)	
B1: Improve Efficiency of Existing Buildings	6,689
B2: Net-Zero Buildings	5,026
Zero-Emission Vehicles (V)	
V1: Expand EV Charging Infrastructure	49,523
V2: Transition City Fleet (and Transit) to EVs	Not Quantified
Smart Mobility (M)	
M1: Expand Infrastructure for Pedestrians, Bikes, and Micro-mobility Solutions	Not Quantified
M2: Improve Transit Effectiveness and Accessibility	Not Quantified
M3: Support Mixed-Use Development Downtown and Along Transit Corridors	Not Quantified
M4: Embrace Mobility as a Service	Not Quantified
Water Conservation & Reuse (W)	
W1: Increase Water Conservation	579
W2: Decrease Carbon Intensity of Delivered Water	Not Quantified
Waste Reduction & Recycling (R)	
R1: Increase Recycling and Organic Waste Diversion	Not Quantified
Nature-Based Solutions (N)	
N1: Increase Local Carbon Sequestration	Not Quantified
Total Reductions	**98,583**

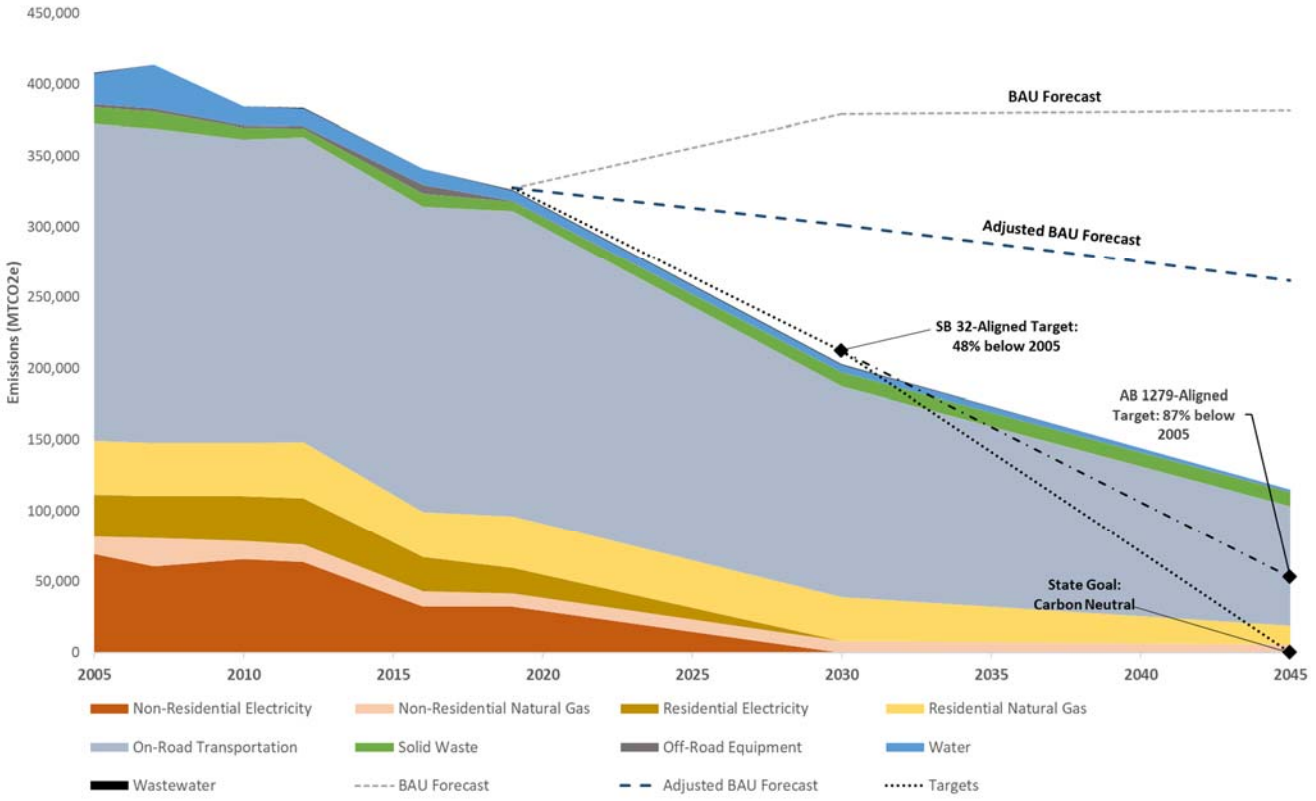
Note: Total may not add up due to rounding

Table 5-2 City of Manhattan Beach 2030 GHG Reduction Summary

DATA/METRIC	2030 ($MTCO_2E$)
BAU Forecast	378,962
Total Reductions from State Measures	77,825
Total Reductions from Local Measures	98,583
Resulting Community Emissions with CAP Implementation	202,554
2030 Emissions Target	**208,018**
Target Met?	**Yes**

Notes: Totals may not add up due to rounding.

Figure 5-1 depicts the City's GHG reduction pathway for meeting the 2030 target and the anticipated reductions after 2030 towards carbon neutrality in 2045. To achieve that goal, additional state and local measures will be needed, including the potential use of carbon offsets.



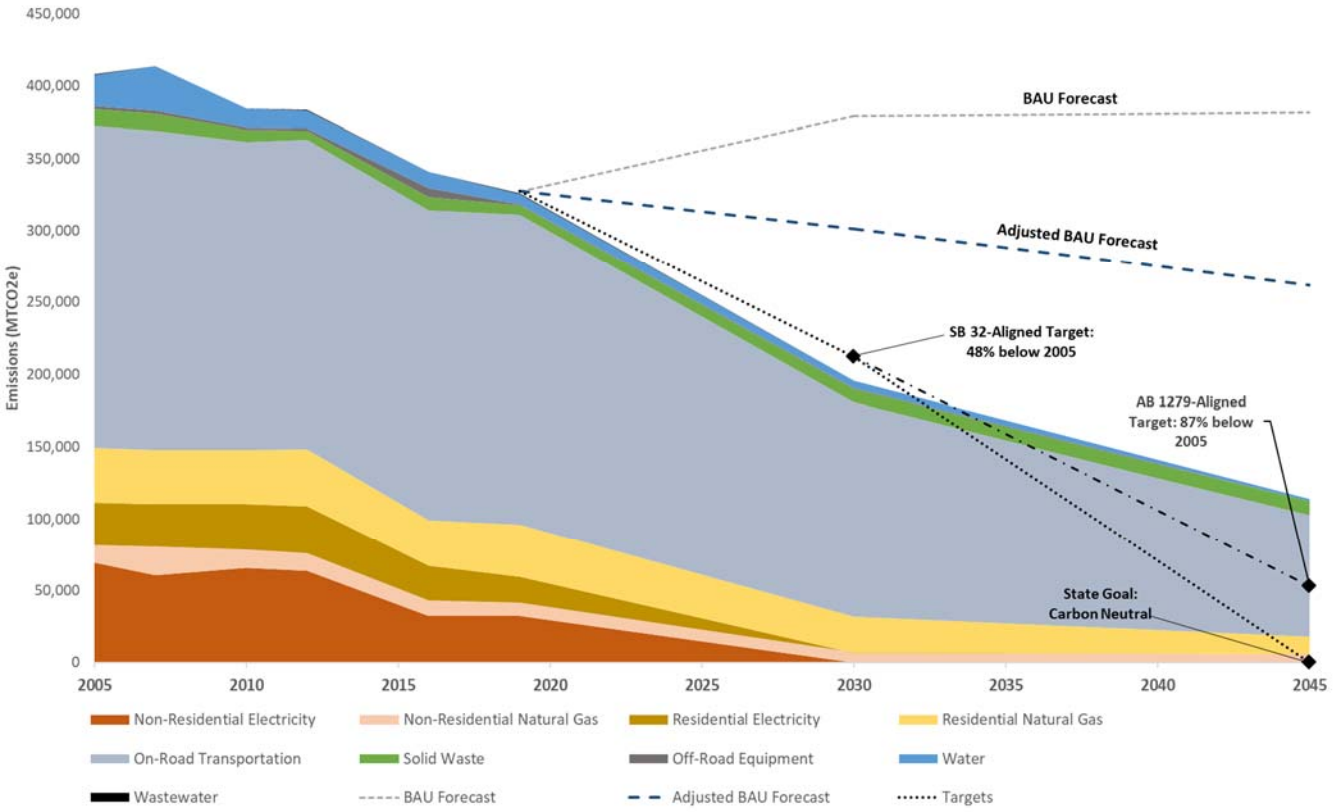


Figure 5-1. Community GHG Emissions Forecasts with CAP Implementation ($MTCO_2e$)
Source: ESA, 2024

The following sections provide in-depth discussion of each of the City's strategies for reducing GHG emissions, describing specific implementing actions, performance objectives, anticipated GHG reductions, community co-benefits, and implementation responsibilities.

Clean Energy Systems (E)

STRATEGY DESCRIPTION

Access to clean, renewable energy resources such as solar, wind, biomass, hydropower, geothermal, and landfill gas is key to a fossil-fuel free Manhattan Beach. Renewables also reduce emissions of conventional air pollutants, such as sulfur dioxide, that result from fossil fuel combustion. In addition, the renewable energy economy creates new jobs and business opportunities and represents a hedge against price fluctuations of fossil fuels.

In 2017 the City took a major step towards a clean energy future by joining the Clean Power Alliance of Southern California (CPA), a nonprofit entity and a community choice energy program that provides green power to its member agencies. CPA serves approximately one million customer accounts across 35 communities throughout Southern California. CPA offers a variety of programs and funding sources geared towards local renewable energy generation and storage as well as demand response management.

Although Manhattan Beach is already connected to a regional grid that can now provide 100 percent renewable energy, the City's energy security will be greatly enhanced through a network of energy storage facilities and microgrids that can power the City's needs independently in the case of grid outages.

Clean Energy is comprised of the following strategies:

- E1: Procure Zero-Carbon Electricity
- E2: Increase Local Solar Energy Generation
- E3: Develop Energy Storage/Microgrids

COMPLEMENTARY STRATEGIES

- B2: Net-Zero Buildings

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 2: A reduced dependency on fossil fuels

Goal 3: A community with clean air

E1: Procure Zero-Carbon Electricity

GHG REDUCTIONS

By 2030: 36,767 MTCO2e annually

By 2045: no reductions beyond RPS requirement

GHG BENEFIT-COST RATIO

High

2030 PERFORMANCE OBJECTIVES

COMMUNITY
Maintain at least 95 percent participation in CPA's 100 percent Green Power tier.

MUNICIPAL OPS
Maintain 100 percent participation in CPA's 100 percent Green Power tier.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

100 percent of community and municipal demand will be met with green (zero-carbon) electricity.

STRATEGY DESCRIPTION

Supplying the community's power needs with green (e.g., zero-carbon or low-carbon) electricity is one of the most important strategies for meeting the City's GHG reduction targets. The Clean Power Alliance of Southern California (CPA) is a nonprofit entity and a community choice energy program that provides green power to its member agencies. CPA serves approximately one million customer accounts across 35 communities throughout Southern California. Manhattan Beach joined CPA in December 2017, powering the community with 50 percent renewable energy. In 2019, municipal facilities opted into 100 percent renewable energy. Beginning October 2021, the default service for all customers transitioned from 50 percent clean to 100 percent Green Power, relying entirely on renewable energy procured by CPA.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

State RPS (100 percent renewable by 2045) and CA Governor's Executive Order B-55-18 (statewide carbon neutrality by 2045).

LA County's OurCounty Strategy 7A:

- Transition to a zero-carbon energy system that reduces air and climate pollution and that minimizes the dangers of a changing climate to our communities and economy.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Work with CPA on outreach to customers to prevent opt-outs and for those who have opted down to a lower renewables tier, potentially offer incentives to re-join the 100 percent tier.

MUNICIPAL OPS

- Municipal Operations: Indefinitely commit to 100 percent renewable electricity for all municipal accounts, including street lighting and traffic signals.

E2: Increase Local Solar Energy Generation

GHG REDUCTIONS

Not quantified (to avoid double counting with E1)

GHG BENEFIT-COST RATIO

High

2030 PERFORMANCE OBJECTIVES

COMMUNITY

Double the community's total solar PV system capacity (based on 2019 levels). This includes residential and non-residential solar PV systems.

MUNICIPAL OPS

Double the City's total solar PV system capacity (based on 2019 levels). This includes all municipal properties within the City.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

The entire City of Manhattan Beach will be a "net zero" consumer of electricity, with the capacity to generate all of the annual electricity it uses.

STRATEGY DESCRIPTION

Expand local solar power generation on rooftops and parking lots throughout the City and in municipal projects. Often called distributed or decentralized power generation, local installations of solar photovoltaic (solar PV) energy systems are a good community investment. They support high-quality jobs and present opportunities for local businesses. Local rooftop solar is generally a cost-effective investment for building owners and provides resilience to grid shutdowns when combined with battery storage. Distributed generation also enhances community resilience to grid failures or utility shut-downs. In 2024, the City implemented an automated, instant solar permitting process for residential solar and storage systems in alignment with SB 379 requirements.

Some households and businesses in Manhattan Beach do not have access to on-site solar PV systems because they rent, live in multi-tenant buildings, or have roofs that are unsuitable to host a solar PV system. Community solar refers to local solar PV systems shared by multiple community subscribers. For those who cannot install solar directly on their property, community solar can be a good option for accessing the economic and environmental benefits of solar energy generation.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

State of California's 2022 Title 24 building code requirements for solar on all new homes and non-residential buildings as of Jan. 1, 2023.

LA County's OurCounty 2035 target:

- Have six GW of new distributed energy resources Countywide.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Increase local participation in SCE's Community Renewables Program, which connects customers with solar developers so that they can purchase renewable electricity from certified community solar projects.
- Partner with Grid Alternatives and other non-profit organizations to assist low-income households in gaining access to affordable rooftop solar installations.
- Partner with LA County to investigate low- or no-cost options to provide community shared solar facilities on County property (OurCounty Plan Strategy 7A, Action 87).

MUNICIPAL OPS

- Require that municipal projects include solar infrastructure installation to the maximum extent feasible.
- Identify existing facilities, public spaces, and associated parking lots with potential for rooftop solar installation and/or solar canopies.

OTHER SUPPORTING ACTIONS:

- Advertise and promote CPA's Solar Marketplace, which provides customers with free, custom solar and battery storage quotes from local, pre-screened installation companies.
- Incentivize CPA customers with existing rooftop solar to register for CPA's Net Energy Metering (NEM) Program, which pays customers for net energy production on an annual basis.
- Promote enrollment in CPA's Power Response Program, which incentivizes qualifying customers to reduce their energy consumption during peak loads.
- Promote enrollment in SCE's Smart Energy Program, Summer Discount Plan, and SCE-advertised third-party demand response programs.
- Facilitate partnerships and information sharing between local construction/roofing contractors and solar companies that increase consumer choice as well as business referrals.
- Establish a local fund sourced by donations from corporations, local businesses, and philanthropists for subsidization of solar projects. Set annual goals for solar projects with a dedicated page on the City's website to track funding and maintain interest/motivation.

E3: Develop Energy Storage/Microgrids

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

NA

2030 PERFORMANCE OBJECTIVES

COMMUNITY

Achieve community electricity storage capacity equal to the city-wide 24-hour average usage.

MUNICIPAL OPS

Begin implementation of a microgrid project for a critical city facility through CPA's Power Ready Program.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Environmental Sustainability

Public Works

CLIMATE POSITIVE VISION

A network of microgrids that can power the City's needs during power outages and periods of high energy demand.

STRATEGY DESCRIPTION

Paired with local solar PV systems, battery storage systems and microgrids can be used to increase community resilience during utility grid outages. A microgrid is a localized energy grid powered by on-site energy sources that can disconnect from the traditional utility grid to operate autonomously. A microgrid can power a single facility like a critical city facility, or it can power a larger area like a business district. During power outages, customers and critical facilities connected to the microgrid still receive power, increasing resilience and energy independence.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty 2035 Target:

- Have six GW of new distributed energy resources Countywide.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Identify potential partnerships, funding, and/or financing sources for installing storage and microgrids in the community.
- Develop a community energy map that identifies opportunities for deploying distributed energy resources and microgrids to improve energy security and resiliency in the community.
- Partner with South Bay Cities COG and SoCalREN to identify potential distributed energy resources opportunities and conduct energy and financial assessments.

MUNICIPAL OPS

- Identify an energy storage pilot project at a municipal facility that will serve as a demonstration site and learning lab for technology and local implementation of future energy storage and microgrid installations. The City can monitor the results of this project and analyze other opportunities for microgrids, with a focus on critical facilities that require power during emergencies, such as fire stations and hospitals.

Green Buildings (B)

STRATEGY DESCRIPTION

The City's Sustainable Green Building Program was adopted in 2023 in alignment with the California Green Building Standards Code (CALGreen), which includes the Title 24 building energy efficiency standard. The City's program requires all new buildings and major retrofits to meet stringent energy efficiency and sustainability requirements.

With these standards in place for new buildings, the City's strategies for Green Buildings focus on the use of natural gas in new and existing buildings. Natural gas for many years has been considered a "bridge fuel" to help us transition to a clean energy economy. For generating electricity or powering vehicles, natural gas is cleaner than other fossil fuels, but still generates GHG emissions and fugitive emissions from its extraction and pipeline delivery. Almost all of the natural gas use in the City of Manhattan Beach is for space and water heating in buildings. For the City to achieve its long-term carbon neutral goal, shifting the energy needed for these purposes to clean electricity or biogas should be a key consideration. Making buildings more energy efficient will make it easier and less costly to shift to these alternatives.

The Southern California Gas Company (SCG) is working to develop renewable natural gas (RNG) and has a goal to make 20 percent of its natural gas supply renewable by 2030. However, utility-provided RNG is not yet commercially available for use in homes and businesses. For the time being, the most effective measures for reducing the climate change impacts associated with natural gas usage are improving building energy efficiency and switching to clean electricity alternatives where feasible.

Green Buildings is comprised of the following strategies:

- B1: Improve Efficiency of Existing Buildings
- B2: Net-Zero Buildings

COMPLEMENTARY STRATEGIES

- E2: Increase Local Solar Energy Generation
- E3: Develop Energy Storage/Microgrids
- EH-2: Reduce the Urban Heat Island Effect

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 2: A reduced dependency on fossil fuels

Goal 3: A community with clean air

B1: Improve Efficiency of Existing Buildings

GHG REDUCTIONS

By 2030: 6,689 MTCO2e annually

By 2045: 5,944 MTCO2e annually

BENEFIT-COST RATIO

High

2030 PERFORMANCE OBJECTIVES

COMMUNITY

Reduce the energy intensity (consumption per square foot) of existing (as of 2019) residential buildings by 15 percent;

Reduce the energy intensity (consumption per square foot) of existing (as of 2019) commercial buildings by 15 percent.

MUNICIPAL OPS

Reduce the energy intensity of existing (as of 2019) municipal buildings by 20 percent.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

The City's buildings will be zero net energy users.

STRATEGY DESCRIPTION

Increasing the energy efficiency of existing buildings reduces GHG emissions by decreasing the consumption of natural gas, electricity that is not 100 percent carbon-free, and other non-renewable energy sources. Energy-efficiency improvements can be achieved through a variety of methods, including energy audits, benchmarking, appliance rebates, building retrofits, and education of consumers. In addition to GHG emission reduction, energy-efficient building improvements can lower energy bills, create local green jobs, and improve the longevity of existing buildings.

In 2016, the City completed an Energy Efficiency Audit of City Parks and Facilities that analyzed existing energy use and provided recommendations for improving efficiency. The City has also been recognized as a leader in SoCal Edison's regional Energy Leader Partnership program, achieving Platinum level status due to its efforts in energy action projects. The City will continue to improve energy efficiency of existing buildings through coordination with agencies and organizations, as well as public outreach to inform building owners of the opportunities available to them.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty Plan 2035 Targets:

- Achieve 100 percent enrollment of eligible households in rate-assistance programs countywide.
- Have 75 percent of major building renovations be net zero carbon countywide.
- Reduce building energy use intensity by 25 percent countywide and in county operations.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Recommend energy-efficiency audits during transfer of ownership of buildings (residential and non-residential).

- Partner with CPA and utilities to promote rebates and financing options for energy-efficiency upgrades.
- Educate building owners on the cost savings of energy-efficiency improvements.

MUNICIPAL OPS

- Conduct energy audits of municipal buildings.

B2: Net-Zero Buildings

GHG REDUCTIONS

By 2030: 5,026 MTCO2e annually

By 2045: 24,444 MTCO2e annually

BENEFIT-COST RATIO

High

2030 PERFORMANCE OBJECTIVES

COMMUNITY

New Development: Incentivize the use of electric appliances in new residential and commercial construction, with exceptions for stoves and outdoor fireplaces.

Existing Development: Reduce residential and commercial natural gas use by 10 percent.

MUNICIPAL OPS

New Development: Evaluate electric alternatives for all proposed new municipal facilities.

Existing Development: Reduce municipal building natural gas use by 10 percent.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

Reduced use of fossil fuels to provide building energy needs.

STRATEGY DESCRIPTION

Natural gas is used by buildings for space heating, water heating, and cooking (particularly in commercial kitchens). The heating of buildings alone generates 20 to 30 percent of the GHG emissions in California, and the state's long-term goal for reducing emissions recognizes the need to greatly reduce the use of natural gas for this purpose, not to mention the co-benefit of improving indoor air quality to create healthier living spaces.

This measure focuses on building electrification, as the existing opportunities for widespread use of RNG to replace fossil natural gas are limited. For new buildings and major renovations, the City can encourage electrification of homes and businesses through its local building code. For existing buildings, the City can promote electrification of household appliances and heating systems through education and financial incentives.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty Plan 2035 Targets:

- Have 75 percent of major building renovations be net zero carbon countywide.
- Have all County facilities be supplied with 100 percent renewable power.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Provide information to residents and businesses about the health, climate, and cost benefits of replacing their existing natural gas appliances and heating equipment with electric-powered alternatives, and distribute information about available products and installation services.
- Partner with local utilities to provide rebates or other incentives for residents to replace natural gas appliances with electric alternatives.
- Educate the community on SCE's services, including their Induction Range Lending Program; their Foodservice Technology Center (FTC) for

energy-efficient, electric foodservice equipment; and their appliance rebates.

MUNICIPAL OPS

- Audit existing municipal buildings at least every five years for the most cost-effective electrification opportunities, develop a 2030 Implementation Plan, and get the needed funding included in the City's CIP.

OTHER SUPPORTING ACTIONS:

- Partner with local builders and appliance suppliers to provide information on the benefits of electrification and the latest products and services.
- Identify and refer the community to demonstration sites where they can experience hands-on familiarity with electric equipment and appliances, including induction stovetops and ranges, driers, water heating, and space heating.

Zero-Emission Vehicles (V)

STRATEGY DESCRIPTION

Zero-emission vehicles (ZEVs) and plug-in hybrid electric vehicles (PHEVs) include electric vehicles (EVs) that run on batteries, hydrogen fuel cell vehicles, which are powered by electricity stored in hydrogen, and hybrid vehicles that run on both batteries and an internal combustion engine. The City of Manhattan Beach has one of the highest rates of EV ownership in California, at approximately 13 percent,[7] compared to two percent statewide. Consumer enthusiasm for ZEVs and PHEVs is rising as technologies improve, prices decrease, and vehicle model selection and variety increases. Considering State and Federal policy initiatives, recent auto industry announcements, and general market momentum, residents of Manhattan Beach will continue to purchase ZEVs and PHEVs and transition away from gasoline- and diesel-powered vehicles.

Zero-Emission Vehicles is comprised of the following strategies:

- V1: Expand EV Charging Infrastructure
- V2: Transition City Fleet (and Transit) to EVs

COMPLEMENTARY STRATEGIES

- E1: Procure Zero-Carbon Electricity
- E2: Develop Energy Storage/Microgrids
- AP3: Reduce emissions from buildings and vehicles

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 2: A reduced dependency on fossil fuels

Goal 3: A community with clean air

[7] 2022 data from CEC; includes all-electric, plug-in hybrid electric, and fuel cell electric vehicles

V1: Expand EV Charging Infrastructure

GHG REDUCTIONS

By 2030: 49,523 MTCO2e annually

By 2045: 107,552 MTCO2e annually

GHG BENEFIT-COST RATIO

Medium

2030 PERFORMANCE OBJECTIVES:

Consistent with the Statewide goal, increase the amount of publicly accessible EV charging stations to 600;

Achieve community-wide 25 percent EV penetration (13 percent as of 2022).

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Public Works

CLIMATE POSITIVE VISION

All vehicles driven in the City are ZEVs.

STRATEGY DESCRIPTION

As of 2024, there are 117 publicly accessible EV charging stations installed throughout the City, 28 of which are City owned. To support the increasing demand for EVs, the City will expand local infrastructure, including charging stations and hydrogen refueling stations, and will support the transition to a clean local fleet.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

2030 Statewide Goal – 700,000 EV charging stations.

LA County's OurCounty 2035 Targets:

- Provide 70,000 additional public EV charging stations Countywide.
- Have 80 percent of all new light-duty private vehicles Countywide be zero-emission.
- Have 15,000 EV charging stations at County facilities.
- Within County operations, have 100 percent medium-duty vehicle and emergency light-duty vehicle purchase be zero-emission or better.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Develop an EV infrastructure plan.
- Provide fast EV charging/hydrogen fueling infrastructure at strategic locations throughout the City.
- Require EV charging stations and EV-designated parking for new development, as required by the state's building code.
- Seek funding sources to streamline permitting of publicly accessible EV charging.

MUNICIPAL OPS

- Provide additional publicly accessible EV charging stations at City facilities.

OTHER SUPPORTING ACTIONS:

- Promote SCE's **Charge Ready Transport Program** for medium- and heavy-duty EVs of non-residential customers.

- Promote utilization of existing incentives for expansion of EV charging infrastructure and purchase of EVs, such as **SCE's Charge Ready Program**, **SCAQMD and MSRC's Residential EV Charging Incentive Pilot Program**, **CARB's Clean Fuel Reward**, and **CalCAP's EV Charging Station Financing Program** for small businesses.[8]
- Establish requirements for new development, such as electric-only TRUs, electric/NG/hydrogen tenant trucks.

[8] See a comprehensive list of California EV incentives at afdc.energy.gov/laws.

V2: Transition City Fleet (and Transit) to EVs

GHG REDUCTIONS

Not quantified; included in community-wide EVs

GHG BENEFIT-COST RATIO

Medium

2030 PERFORMANCE OBJECTIVES

MUNICIPAL OPS

Consistent with CARB's Advanced Clean Fleets Regulation, achieve 50 percent electric-powered or zero emissions municipal fleet and equipment.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Public Works

CLIMATE POSITIVE VISION

100 percent of municipal fleet vehicles are ZEVs.

STRATEGY DESCRIPTION

The City is improving the fuel efficiency of its vehicle fleet by purchasing low- or zero-emission vehicles whenever possible as vehicles are retired from service. To set an example for the community, the City can transition to an all-electric municipal fleet and can transition away from fossil-fuel powered equipment, as feasible.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

CARB Advanced Clean Fleets Regulation:

- Affected fleets must ensure, beginning January 1, 2024, that 50 percent of their annual vehicle purchases per calendar year are zero-emissions, and beginning January 1, 2027, that 100 percent of vehicle purchases are zero-emissions.

LA County's OurCounty 2035 Targets:

- Provide 70,000 additional public EV charging stations Countywide.
- Have 80 percent of all new light-duty private vehicles Countywide be zero-emission.
- Within County operations, have 15,000 EV charging stations at County facilities.
- Within County operations, have 100 percent medium-duty vehicle and emergency light-duty vehicle purchase be zero-emission or better.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Continue to promote and encourage electric municipal maintenance equipment, e.g., lawnmowers.
- Continue to collaborate with SBCCOG and Beach Cities Transit to transition towards a shared, electric, connected, and automated transportation network.

MUNICIPAL OPS

- Ensure compliance with CARB's Advanced Clean Fleets Regulation.

Smart Mobility (M)

STRATEGY DESCRIPTION

Smart mobility emphasizes healthy modes of transportation that allow residents to access daily needs, including work, school, shopping, and recreation, without undue burdens of cost, time, or physical danger. The City of Manhattan Beach Mobility Plan, adopted in May 2018, strives to develop a balanced, multi-modal transportation system for the movement of people and goods, with an emphasis on non-motorized modes of transportation (bicycling and walking). The Mobility Plan's policies promote reductions in vehicle trips and vehicle miles traveled (VMT) by providing support for public transit, bicycle and pedestrian infrastructure, car sharing, mixed-use development, and encouraging Transportation Demand Management (TDM) plans for all major developments or facility expansions to encourage ride-sharing and other improvements.

Regarding public transit, Manhattan Beach is served by Beach Cities Transit bus routes that connect Redondo Beach, Hermosa Beach, Manhattan Beach, and El Segundo. Beach Cities Transit also provides transit connections with Metro Bus & Rail (with green line light rail stations just outside the City boundary), Torrance Transit, Gardena Municipal Bus Lines, Palos Verdes Peninsula Transit Authority, and Lawndale Beat. Torrance Transit serves the south side of the City along Artesia Blvd.

In November 2020, the City adopted local Transportation Impact Analysis (TIA) Guidelines in compliance with SB 743 in an effort to reduce VMT for new developments and projects. The TIA Guidelines are consistent with and support the City's Mobility Plan goals to "provide a balanced, safe and efficient multi-modal transportation system".

In 2018, the City participated in a SCAG grant to prepare a Beach Cities Living Streets Design Manual (Manual) to provide guidance on designing its streets for health, safety, livability, sustainability, and more. The Manual is meant to improve accessibility and equity for all street users. The Manual is currently in a draft form.

Smart Mobility is comprised of the following strategies:

- M1: Expand Infrastructure for Pedestrians, Bikes, and Micro-Mobility Solutions
- M2: Improve Transit Effectiveness and Accessibility
- M3: Support Mixed-Use Development Downtown and Along Commercial Corridors
- M4: Embrace Mobility as a Service
- Also see supporting strategies

COMPLEMENTARY STRATEGIES

- V1: Expand EV Charging Infrastructure
- AP3: Reduce emissions from buildings and vehicles

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 2: A reduced dependency on fossil fuels

Goal 3: A community with clean air

Goal 4: Buildings and infrastructure that support human health and emissions reduction

Goal 5: A safe and efficient transportation system that enhances mobility and reduces car dependency

M1: Expand Infrastructure for Pedestrians, Bikes, and Micro-Mobility Solutions

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

NA

2030 PERFORMANCE OBJECTIVES

Zero fatal accidents involving pedestrians and bicyclists;

Increase existing Class I bike path miles by 10 percent and Class II bike lane miles by 25 percent.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

Streets designed for travel by walking, bicycling, and using transit; using less total paved area; and reducing water runoff, GHG emissions, and energy consumption.

STRATEGY DESCRIPTION

The City's Mobility Plan reflects the emphasis on non-motorized modes of transportation (bicycling and walking) as well as the implementation of streets that serve the mobility of all users by providing high quality pedestrian, bicycling, and transit access to all destinations throughout the city. The Mobility Plan includes a goal to create well-marked pedestrian and bicycle networks to facilitate these modes of circulation. Safety is a critical factor in getting people to shift to active modes like biking and walking. Designing streets and travel routes that consider safe travel for all modes can reduce the occurrence and severity of vehicular collisions with pedestrians and bicyclists. The Mobility Plan emphasizes Complete and Living Streets concepts, where the goal is to repurpose City streets to accommodate all users of the roadway, including bicyclists, children, persons with disabilities, motorists, pedestrians, users of transit, and seniors. The Living Streets concept goes beyond Complete Streets to incorporate elements of social and economic vitality, health and quality of life, aesthetically pleasing landscaping and street furniture, and the restoration of the urban ecosystem.

As noted in the City's Mobility Plan, the climate in Southern California is perfect for bicycling, with rain falling less than 30 days a year and moderate temperatures most of the year. Cycling to work or school is a popular means of transportation for short distances in Manhattan Beach. From 2018 to 2020, bike counts showed an increase in the number of bicyclists at key locations in Manhattan Beach, including The Strand and 16th Street, Marine Ave and Peck Ave, and along Pacific Ave and Rosecrans Ave. Allowing bicycles on buses, providing secure bicycle parking facilities at work and shopping destinations, and providing safe routes are all key to increasing the use of bicycles for daily transportation needs.

Micro-mobility refers to transport provided by small, lightweight vehicles operating at relatively low speeds (typically below 15 mph) and driven by users personally (e.g. zero-emission, slow speed vehicles such as bikes,

scooters, and golf carts.) In addition to traditional pedal-powered bicycles, micro-mobility devices include electric bikes (e-bikes), electric scooters, electric skateboards, and shared bicycles. Effective integration of micro-mobility transport into the transportation network of Manhattan Beach will become increasingly important to decreasing GHG emissions by providing more mobility options for short distance trips and by providing a "door to door" solution for longer trips that public transit cannot provide.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

Local Transportation Impact Analysis Guidelines for complying with SB 743 and reducing regional VMT.

LA County's OurCounty 2035 Target:

- Countywide, ensure that 35 cities and/or unincorporated communities have a walk score of 70 or higher.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Partner with the South Bay Cities Council of Governments (SBCCOG) to implement the Local Travel Network program which promotes and supports the safe use of micro-mobility modes of transportation.
- Implement the Mobility Plan and Living Streets Design Manual concepts and elements on every eligible street or initiate the process by preparing and adopting bicycle plans, pedestrian plans, green streets plans, Safe Routes to School plans, and an Americans with Disabilities Act transition plan.
- Implement the Mobility Plan's policies that facilitate pedestrian and bicycle modes of transport, including safe, secure, and well-marked pedestrian and bicycle networks; safe routes to schools; bicycle facilities identified in the South Bay Bicycle Master Plan; and multi-modal connections to transit facilities.
- Amend the 2018 Mobility Plan with a policy to provide safe and convenient pathways and infrastructure for micro-mobility solutions, including personally owned electric scooters and bikes.
- Encourage annual bike path (Class I) and bike lane (Class II) counts to measure success of mobility programs.
- Require property owners, at the time of new construction or substantial remodeling, to dedicate land for public improvements such as roadways and wider sidewalks and/or bicycle lanes, as appropriate and warranted by the project (Mobility Plan Policy I-1.6).
- Implement the City's Local Transportation Impact Analysis Guidelines to support reduced VMT.
- Allow for flexible use of public rights-of-way to accommodate all users while maintaining safety standards (Mobility Plan Policy I-1.11).

- Encourage the Manhattan Beach Unified School District and private schools to promote active modes of transportation for students and employees as a means of reducing peak-hour traffic (Mobility Plan Policy I-3.8)
- Introduce a mobility-as-a-service platform that gives City residents access to all types of low-carbon mobility options.
- Apply for grants through West Basin Municipal Water District for installing water bottle filling stations in more City facilities and outdoor areas.

M2: Improve Transit Effectiveness and Accessibility

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

Medium

2030 PERFORMANCE OBJECTIVES

Increase local transit ridership by 20 percent;

Provide transit stop amenities (refuse cans, benches, and shelters) to all bus stop locations.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Public Works

CLIMATE POSITIVE VISION

Safe and clean public transit that meets the everyday needs of the City's residents and businesses.

STRATEGY DESCRIPTION

Public transit plays a crucial role in the development of a multimodal transportation network that can help reduce car dependence. High quality public transit increases the mobility of residents who are unable or prefer not to drive, and gives residents who do drive the option of taking alternative forms of transportation. While the City does not own or operate any mass public transit service in Manhattan Beach, transit service is provided by several transit operators including Los Angeles County Metro (MTA), Beach Cities Transit (BCT), Los Angeles Department of Transportation (LADOT), and Torrance Transit. All BCT, MTA, Torrance Transit, and LADOT buses are equipped with front-loading bike racks, making public transit a viable option for commuters in Manhattan Beach.

The City of Manhattan Beach Mobility Plan reflects the City's commitment to enhancing the mobility options for all users of public transit. Transit availability and accessibility will play a crucial role in the City's effort toward building a convenient, efficient, and safe multi-modal transportation network in Manhattan Beach.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty 2035 Targets:

- Have all trips by foot, bike, micro-mobility or public transit Countywide increase to at least 30 percent.
- Reduce average daily VMT per capita to 15 miles.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Partner with Beach Cities Transit to assess current transit routes and identify opportunities for improvement geared towards Manhattan Beach residents.
- Upgrade and maintain transit stops with weather protection, security measures, increased comfort and accessibility, and access to accurate

information on transit routes, schedules, fares, connections, and destinations.

- Improve access to real-time transit vehicle arrival information in multiple languages.
- Enhance multi-modal connections to transit facilities, especially to the Metro Green Line stations (Mobility Plan Policy I-1.7).
- Support Dial-A-Ride or other para-transit systems for the senior and disabled members of the community (Mobility Plan Policy I-1.5).
- For the City's Dial-a-Ride program, explore the potential to provide fare-free rides through a subsidized fare program for the elderly, or those with qualifying low income.
- Support First Mile/Last Mile mobility improvements between transit stops and places of work and residential districts.

M3: Support Mixed-Use Development Downtown and Along Commercial Corridors

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

NA

2030 PERFORMANCE OBJECTIVES

Adopt mixed-use development standards into the City's Local Coastal Program.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Community Development

CLIMATE POSITIVE VISION

Fewer vehicle trips resulting from better locational efficiency of housing, shopping, and employment centers.

STRATEGY DESCRIPTION

Smart development includes optimizing transit access, providing a safe and convenient bike and pedestrian network and diversifying land uses. Mixed-use developments help to reduce short, single-occupant vehicle (SOV) trips by improving walkability and encouraging active transportation. The City's General Plan supports efforts to integrate mixed-use development into commercial areas. In addition, many residences in the City are in close proximity to Sepulveda Blvd, a major commercial corridor served by transit. In approving new development, the City can consider the GHG reduction benefits of locating mixed uses in these areas, particularly where there is overlap with transit services. The City recently submitted its 6th Cycle Housing Element Update to the State Department of Housing and Community Development (HCD). The updated Housing Element was certified by HCD on May 31, 2023, and includes goals and policies aimed at increasing implementation of mixed-use development projects.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

State Green Building code (CALGreen) requires EV charging stations, low emission vehicle parking, and carpool parking for new developments.

LA County's OurCounty Plan 2035 Targets:

- Have at least 65 percent of new housing Countywide built within half a mile of high-frequency transit.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Continue to identify areas within the City where development should be focused to increase density and diversity of land use.
- Incentivize development projects to include land uses for which residents may take regular trips, such as grocery stores, pharmacies, or restaurants.

- Locate businesses and job centers along transit corridors and areas with established bike and pedestrian networks (e.g., Sepulveda Blvd and Artesia Blvd.)
- Encourage mixed-use development by reducing parking requirements where justified by shared parking and travel demand management strategies.

M4: Embrace Mobility as a Service

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

NA

2030 PERFORMANCE OBJECTIVES

Expand travel options that don't require personal vehicle ownership.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Community Development

CLIMATE POSITIVE VISION

Fewer cars and a proliferation of travel options that don't require personal vehicle ownership.

STRATEGY DESCRIPTION

Mobility-as-a-Service (MaaS) describes a shift away from personally-owned modes of transportation and towards mobility provided as a service. Advances in communications and vehicle technology are enabling these new modes and reshaping how we get around. Technology-enabled ride-sharing and car sharing have become widely adopted, and as recognized by the City's Mobility Plan, the internet and big data are influencing route choice and mode choice as people plan their trips to work and elsewhere. Meanwhile, the anticipated proliferation of so called "autonomous vehicles" offers the promise of safe and efficient transport but could dramatically impact how we design and use our cities. Similarly, real-time information and the ability to change parking pricing and provide accurate parking information will affect how the City operates our parking systems. All of these changes and many more will reduce the use of single passenger autos, make other modes of travel more desirable, increase the efficiency of all modes, and provide much more information to travelers so that more informed and better travel decisions can be made within and through the City. These developments can provide multiple financial and environmental benefits as well. Fewer cars on the roads means less traffic congestion, less air pollution, and lower carbon emissions, as well as reduced need for parking infrastructure and savings on fuel and maintenance costs for those who reduce vehicle ownership.

Limiting parking requirements for new development in certain areas may encourage the use of MaaS or more active modes like walking and biking, but caution should be taken to avoid incentives to travel to more distant locations with plenty of parking.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty 2035 Targets:

- Have all trips by foot, bike, micro-mobility, or public transit Countywide increase to at least 30 percent.
- Reduce average daily VMT per capita to 15 miles.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Promote car-sharing and neighborhood electric vehicles as important means to reduce traffic congestion and further promote climate action projects (Mobility Plan Policy I-1.10).
- Encourage the development of Transportation Demand Management (TDM) plans for all major developments or facility expansions to encourage ride-sharing and other improvements, thereby reducing vehicle trips (Mobility Plan Policy I-1.3).
- Explore feasibility for implementing an EV car share program, e.g., Blink.
- Partner with the South Bay Cities Council of Governments (SBCCOG) to develop and implement the Local Travel Network program.
- Implement curb management strategies to encourage MaaS in areas not subject to coastal parking requirements.
- Offer reduced parking requirements for new development projects that provide dedicated car-share facilities.

Water Conservation & Reuse (W)

STRATEGY DESCRIPTION

GHG emissions associated with the energy needed for pumping and conveyance of water represent approximately two percent of the 2019 Community GHG Inventory. In addition to saving energy, water conservation has important co-benefits. Conservation programs and water infrastructure improvements help to maintain the quality, safety, and reliability of tap water and minimize the need to purchase bottled water. Longer and more extreme droughts expected with climate change increase the risks to the City's water supply, making supply management and effective conservation programs a top priority. The City's existing Water Conservation Ordinance provides best practices for water conservation, including permanent water conservation requirements and drought restrictions to be imposed upon declaration of a water shortage. The Ordinance was amended in 2015 to reduce over-irrigation oversaturation of landscaping and unnecessary waste of water caused by runoff.

Water Conservation and Reuse is comprised of the following strategies:

- W1: Increase Water Conservation
- W2: Decrease Carbon Intensity of Delivered Water

COMPLEMENTARY STRATEGIES

- CP2: Create a Climate and Resilience Education Program to increase local awareness about climate change.
- ED1: Use scarce water resources more efficiently
- ED2: Increase potable water reuse and recycling
- ED3: Incorporate climate change considerations into local and regional water resource planning
- SF1: Increase the permeability of surfaces in Manhattan Beach

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 6: Sustainable production and consumption of resources

Goal 7: Populations and neighborhoods that are resilient to climate change

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

WI: Increase Water Conservation

GHG REDUCTIONS

By 2030: 572 MTCO2e annually

By 2045: Zero additional reductions, due to 100 renewable electricity (RPS)

GHG BENEFIT-COST RATIO

Low

2030 PERFORMANCE OBJECTIVES

Reduce community per capita water use by 10 percent.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Public Works

CLIMATE POSITIVE VISION

Community water consumption that does not exceed the City's sustainable supply.

STRATEGY DESCRIPTION

Reduce indoor and outdoor water consumption through ordinances, rate structuring, education and outreach, and/or promotion of conservation programs.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

AB 1668 Targets:

- 52.5 gallons per capita per day (GPCD) indoor residential water use by 2025.
- 50 GPCD indoor residential water use by 2030.

LA County's OurCounty Plan 2035 Targets:

- Have water demand stay below 100 GPCD Countywide.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Encourage a tiered billing structure that incentivizes account owners for water conservation.
- Update the existing landscape ordinance to facilitate implementation of Model Water Efficient Landscape Ordinance (MWELO).

MUNICIPAL OPS

- Continue the use of recycled water for municipal irrigation needs.
- Create a municipal landscaping plan that includes the installation of stormwater capture features, such as bioswales and rain gardens, and compiles a selection of pre-approved native, drought tolerant plant species to be used for City landscaping projects.
- Replace flush and flow fixtures in municipal facilities to improve water efficiency.

W2: Decrease Carbon Intensity of Delivered Water

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

Low

2030 PERFORMANCE OBJECTIVES

Increase the City's use of recycled water or graywater to 20 percent of total water demand.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Public Works

CLIMATE POSITIVE VISION

A sustainable, low carbon water supply through more recycling.

STRATEGY DESCRIPTION

This strategy supports improving and expanding the water supply through water reclamation (recycling) and water reuse infrastructure. The City can increase the supply of recycled water and expand its delivery infrastructure to reach more customers and support the use of graywater and rainwater catchment systems by local residents and businesses. The City can support efforts to maintain and upgrade water infrastructure and conveyance systems to minimize leaks and prevent waste.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

LA County's OurCounty 2035 Targets:

- Countywide, have 65 percent of water be locally sourced.
- Achieve compliance with Clean Water Act permit requirements and achieve water quality standards Countywide.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Streamline permitting for residential graywater systems.
- Develop an ordinance requiring use of recycled water or graywater to meet irrigation needs in all new development.
- Provide resources and rebates for residential/business catchment systems.

MUNICIPAL OPS

- Partner with the West Basin Municipal Water District to install additional recycled water pipelines.

Waste Reduction & Recycling (R)

STRATEGY DESCRIPTION

Organic waste that decomposes in landfills generates methane gas (CH_4), a GHG that is approximately 25 times more potent than carbon dioxide (CO_2) over a 100-year time frame and even more potent over shorter time spans. In addition, the collection, transportation, and handling of waste causes emissions from trucks and facility operations. Waste reduction and diversion programs prevent materials from ending up in landfills, and recycling reduces GHG emissions associated with the energy involved in material goods and their packaging.

Although GHG emissions resulting from the decomposition of solid waste account for approximately two percent of the 2019 Community GHG Inventory, there are many co-benefits for the community associated with waste reduction. Diverting waste from landfills reduces the City's reliance on landfills, which can be costly to permit and locate in or near an urbanized area. Solid waste collection and disposal costs continue to increase, and 92 percent of cities indicate that rates will go up in the next few years in order to implement the requirements under SB 1383 (Cal Cities, 2021). Minimizing landfilling would help reduce those rising costs to the City. Fewer waste collection vehicles result in less traffic, better roads, and improved air quality. Minimizing solid waste in landfills can improve community health by reducing exposures to methane gas and toxic stormwater runoff that can contaminate groundwater and surface water. Other benefits associated with solid waste diversion include improvements to social equity and promotion of sustainable economics.

The City has several existing policies in place to encourage sustainable waste reduction and recycling. The City's Green Purchasing Plan identifies sustainable purchasing practices that reduce waste and minimize environmental impacts, toxins, pollution, and hazards to worker and community safety to the greatest extent practicable. The City seeks to purchase products that include recycled content, are durable and long-lasting, conserve energy and water, use agricultural fibers and residues, reduce GHG emissions, use unbleached or chlorine-free manufacturing processes, are lead-free and mercury-free, and use wood from sustainably harvested forests where feasible. Additionally, SB 1383, passed in 2016, requires CalRecycle to develop regulations to reduce organics in landfills. Consistent with this policy, the City has adopted Ordinance #21-0006 which requires the City to adopt and enforce SB 1383 regulations. Most notably, SB 1383 aims to divert 75 percent of organic waste from landfills below 2014 levels by 2025.

The City's Comprehensive Plastic Pollution Policy bans the use and distribution of single-use plastic straws, stirrers, and utensils. The City's Plastic Bag Ban prohibits carry-out plastic bags from both retail establishments and restaurants. The City has also adopted a Polystyrene Ordinance that prohibits the use of polystyrene food service ware (foam and plastics #6), including at City-permitted events. In 2014, City Council expanded the ordinance to include all polystyrene plastic and foam food service materials, including ice coolers, straws, cup lids, and utensils made from polystyrene materials. In 2018, Council also prohibited the sale and use of polystyrene packing materials, polystyrene produce trays, and polystyrene egg cartons; in 2019, polystyrene meat trays were also banned. Ordinance No. 19-0003 prohibits the release of balloons in the City and restricts the sale, distribution, and use of mylar balloons. The City publishes educational material that explains the regulation and identifies allowable alternatives to single-use plastics.

The City also has the Green Events Matrix that requires all event applications in Manhattan Beach to have an environmental protection plan. Events are expected to implement measures to reduce impacts and costs to the environment, the City, and the community. The matrix asks how the event organizer will conserve energy and reduce waste and single-use items, including compliance with City ordinances that ban the use of single-use plastic straws, utensils, bags, mylar/foil balloons, and polystyrene foam/plastic #6. There are special requirements for events for groups of 500 or more regarding the use of recycling containers, event staging and construction, transportation, use of alternative energy/fuels, and education of vendors and service providers.

Waste Reduction and Recycling is comprised of the following strategies:

- R1: Increase Recycling and Organic Waste Diversion

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 6: Sustainable production and consumption of resources

R1: Increase Recycling and Organic Waste Diversion

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

High

2030 PERFORMANCE OBJECTIVES

COMMUNITY
Reduce community-wide organic waste disposal by 75% from 2014 levels in alignment with SB 1383.

MUNICIPAL OPS
Reduce municipal organic waste disposal by 75% from 2014 levels in alignment with SB 1383.

CITY DEPARTMENT RESPONSIBLE FOR IMPLEMENTATION

Public Works

CLIMATE POSITIVE VISION

Zero waste to landfill.

STRATEGY DESCRIPTION

Promote and provide services for diverting yard waste, food scraps, and compostable paper from landfills to beneficial use, including compost and energy production. Increase diversion of recyclable materials from landfills through ordinances, service improvements, education and outreach, and promoting product stewardship and markets for material reuse.

This strategy supports the City's Food Waste Collection Program. In 2014, the City established its first commercial and residential food waste collection pilot program, with over 20 commercial and 775 residential participants, diverting food waste from the landfill. In 2015, City Council adopted a contract amendment with Waste Management to offer a permanent food waste recycling program to both businesses and residents. From 2015 through June 2020, both the commercial and residential food waste recycling programs utilized an Industrial Use process. All food scraps were transported to the CORe facility in Orange, CA, placed in its centrifuge and converted to an Engineered Bio Slurry (EBS). The EBS was transferred to the LA County Wastewater Treatment Plant in Carson, CA and converted to energy.

The City began a new exclusive franchise agreement with hauler Waste Management in July 2020. The commercial customers continue to participate in the Industrial Use program with the CORe facility with no program changes. The residential customers, however, now participate in a curbside organics composting program. The yard waste and food waste can now be combined, and the program no longer allows any plastic bags of any kind in the Organics cart (even biodegradable and compostable bags). Residents place their yard waste and food waste in the Organics cart and the now-mixed material is transported to Waste Management's commercial composting facility in Lancaster, CA.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

Senate Bill 1383 Target: reduce organic waste disposal by 75 percent from 2014 levels by 2025.

Assembly Bill 1826: mandatory organic waste collection for businesses that generate two or more cubic yards of solid waste per week.

Assembly Bill 341: mandatory organic waste collection for businesses, multi-family dwellings with five or more units, and public entities that generate four or more cubic yards of solid waste per week.

LA County's OurCounty 2035 Targets:

- Decrease waste generation Countywide by 30 percent overall per capita.
- Reduce organic waste sent to landfills Countywide by 90 percent.
- Increase the total capacity for organic waste processing in Southern California by 30 percent.
- Achieve 90 percent waste diversion from landfills Countywide.

KEY IMPLEMENTING ACTIONS

COMMUNITY

- Partner with the Manhattan Beach Unified School District and any private schools to establish a recycling and organic waste collection and education program in schools.
- Mandate organic waste collection, including food waste, in any new multi-family development.

MUNICIPAL OPS

- Add organic waste receptacles in all municipal facilities and in public spaces.

Nature-Based Solutions (N)

STRATEGY DESCRIPTION

Urban green spaces, including parks and urban trees, green roofs and bioswales, enhance carbon sequestration and conserve biodiversity. These components of the City's green infrastructure improve stormwater management, reduce urban heat islands, support biodiversity, reduce air pollution, and increase access to natural spaces. The City's marine environment also offers the opportunity to enhance habitats and sequester carbon through so-called "blue carbon" projects that promote growth of eelgrass, kelp, and other aquatic plants. The City will seek opportunities to utilize these nature-based approaches to sequestering carbon dioxide and providing social, environmental, and economic benefits to the community.

Nature-Based Solutions is comprised of the following strategies:

- N1: Increase Local Carbon Sequestration

COMPLEMENTARY STRATEGIES

- W1: Increase Water Conservation
- EH2: Reduce the urban heat island effect
- AP 1: Expand green infrastructure across the City
- ED1: Use scarce water resources more efficiently
- ED3: Incorporate climate change considerations into local and regional water resource planning
- SF1: Increase the permeability of surfaces in Manhattan Beach
- SR 1: Increase the resiliency of the beach

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 3: A community with clean air

Goal 7: Populations and neighborhoods that are resilient to climate change

Goal 8: Buildings and infrastructure that are resilient to climate change

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

N1: Increase Local Carbon Sequestration

GHG REDUCTIONS

Not quantified

GHG BENEFIT-COST RATIO

NA

2030 PERFORMANCE OBJECTIVES

Increase the City's tree canopy cover by five percent using native and drought-resistant species.

CITY DEPARTMENTS RESPONSIBLE FOR IMPLEMENTATION

Community Development

Parks and Recreation

Public Works

CLIMATE POSITIVE VISION

Urban greening that maximizes carbon sequestration.

STRATEGY DESCRIPTION

Urban trees beautify the landscape, reduce heat stress, improve stormwater infiltration, increase property values, and provide animal habitat, among other benefits. Similarly, transitioning from grey to green infrastructure brings numerous benefits.

The Manhattan Beach Urban Forestry Program oversees approximately 12,000 trees within nearly four square miles and is responsible for administering proper tree care; planting new trees; removing dead and hazardous trees; conducting reforestation projects in parks, municipal grounds, open spaces, medians, and streets; and maintaining a street tree database with maintenance information about trees throughout the City. As part of the program, the City developed an Urban Forest Master Plan to provide a long-term framework for managing and preserving the community urban forest. An inventory of the public and private trees in Manhattan Beach shows tree canopy covers almost 15 percent, or 370 acres, of the City's land, primarily from broadleaf evergreens which offer year-round foliage (City of Manhattan Beach, 2019). Up to 13 percent (341 acres) of the City's land may be suitable to support additional tree canopy.

The City also has an adopted Pesticide/Herbicide Ban that applies to municipal landscaping practices and further encourages sustainable management of natural and green spaces and resources.

ALIGNMENT WITH STATE AND COUNTY INITIATIVES

California 2030 Natural and Working Lands Climate Change Implementation Plan.

LA County's OurCounty 2035 Targets:

- Convert 20 percent of heat-trapping surfaces to cool or green surfaces Countywide.
- Reduce the number of heat-stress emergency department visits per 100,000 residents by 45 percent Countywide.
- Increase urban tree canopy cover by 15 percent of 2016 baseline Countywide.

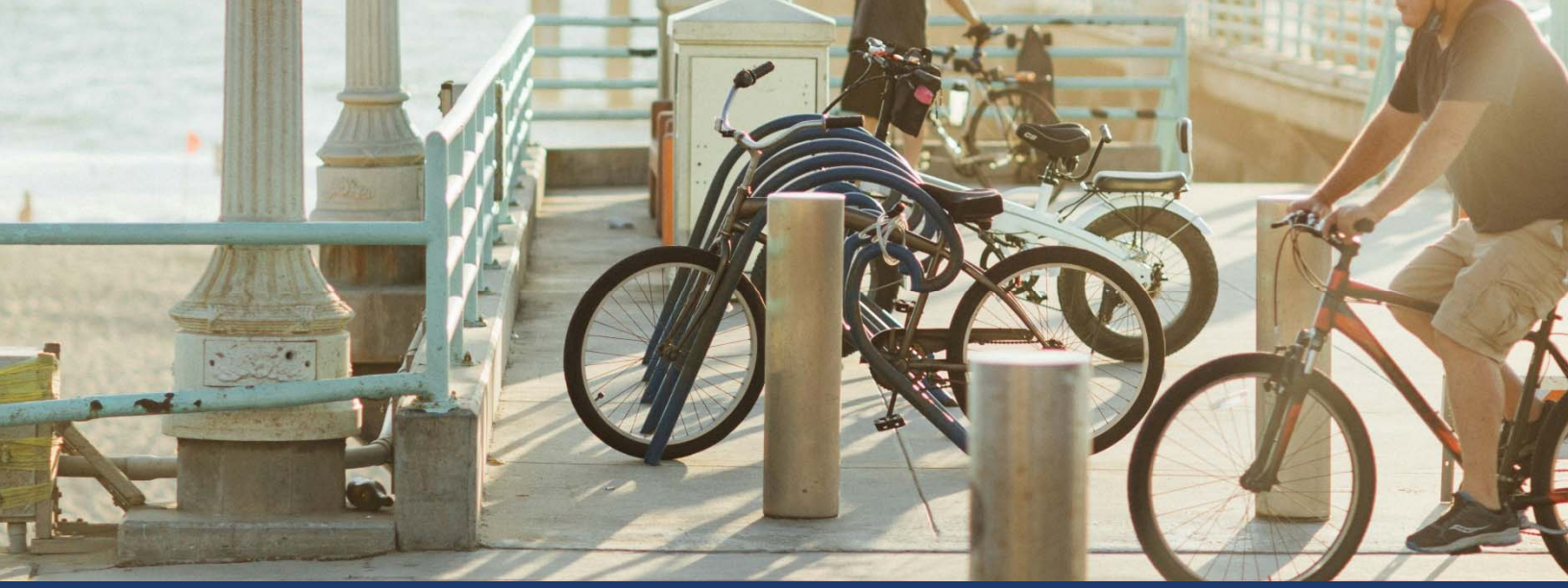
KEY IMPLEMENTING ACTIONS

COMMUNITY

- Expand the urban tree canopy while enhancing the City's Urban Forestry Program through site visits to further prioritize planting opportunities identified in the Urban Forest Master Plan. For private properties, assist property owners with selection for drought-resistant tree species that can survive future changes to the local climate.
- Fund and implement a green infrastructure program for the City's parks, streets, and public spaces, to improve stormwater management, support biodiversity, reduce air pollution exposure, and increase access to natural spaces, including trees.

MUNICIPAL OPS

- Prioritize investment in neighborhoods dominated by concrete and asphalt with limited green space and elevated air pollution, and in areas where green infrastructure, including trees and other types of vegetated buffers, can effectively address stormwater management issues.



CHAPTER 6

Strategies and Actions to Increase Resilience

This chapter outlines strategies and actions for increasing resilience to the climate change vulnerabilities described in Chapter 4, and in more detail in the Climate Change Vulnerability Assessment (Appendix D). These strategies are organized by the hazards of concern identified in Chapter 4 and are intended to strengthen the City's capacity to adapt to those hazards. The strategies and actions identified here build on and support the overarching plan goals identified in Chapter 2. Additionally, resilience strategies are oriented to the four phases of building community adaptation and resilience as described in the State Adaptation Planning Guide (California OES, 2020) and operationalized by FEMA and other emergency response agencies: mitigation, preparedness, response, and recovery (see inset).

Community Preparedness (CP)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 1: An informed, engaged, and equitable community;

Goal 7: City populations and neighborhoods that are resilient to climate change hazards

Key Terms

Comprehensive adaptation planning addresses all four phases of the emergency management cycle as identified by FEMA and the California Adaptation Planning Guide:

- **Mitigation** includes actions taken before a disaster or extreme event to minimize a hazard's negative impact. This could include planting trees to reduce the impact of extreme heat events.
- **Preparedness** increases the capacity of a community to respond to hazards. This could include public outreach in preparing for disasters.
- **Response** includes all actions taken as an immediate response to a hazard event. This can include actions taken as a response to an anticipated disaster such as a warning system.
- **Recovery** includes restoring community functions and usually corresponds to mitigation. This could include rebuilding community buildings to the most updated fire and flood codes.

Source: California OES, 2020

An engaged and informed community is at the heart of increasing community resilience and adapting to climate change. Responding to the challenges of climate change will require increased coordination between the City government and citizens, in addition to leveraging the local knowledge of the community. Strengthening the City's emergency response system to be more accessible and reactive to the needs of the community will create a safer and more cohesive community. Additionally, a key component of building community resilience is applying lessons learned following a damaging climate event to enable the community to build back stronger.

During workshops, community members indicated an interest in expanding climate change education and creating grassroots opportunities for residents to become involved with adaptation opportunities. These strategies and actions reflect the community's interest in becoming more integrated into the climate adaptation process.

Note: Strategies that address multiple hazards or are intended to build community resilience broadly are listed under Community Preparedness.

CITY STRATEGIES TO INCREASE COMMUNITY PREPAREDNESS

CP1: Create a Community Climate Action Network that works with community partners to facilitate coordination and communication between the City and the community with regard to climate action and adaptation.

- Action CP1a: Identify actions that individuals and neighborhoods may take to further grassroots climate action and adaptation efforts.
- Action CP1b: Establish a grant program to fund local, citizen-led projects and programs to build resilience, reduce emissions, and increase community involvement in climate change adaptation.

CP2: Create a Climate and Resilience Education Program to increase local awareness about climate change.

- Action CP2a: Develop a curriculum and outreach materials to be used in schools and by community organizations.
- Action CP2b: Target outreach to local businesses and identify actions that local businesses may take to increase resilience.

CP3: Collaborate with community-based organizations, local emergency responders, and local health departments to develop an inventory of locations with isolated seniors and other vulnerable populations and develop a plan to reach them.

- CP3a: Establish mutual aid networks in local communities to connect neighbors and support households with limited mobility or that are linguistically isolated.
- CP3b: Provide opportunities for an inventory of vulnerable populations to be updated and improved following climate events or other disruptions.

CP4: Emergency response and recovery designed to serve a range of community needs.

- CP4a: Develop a Community Recovery Plan that: identifies the most up-to-date flood and fire codes that buildings should follow when being rebuilt; includes a process for "lessons learned" to be discussed following a climate event and to be applied in future updates to the Plan; incorporates community input; and provides a way for climate change impacts to be monitored over time with regard to the location and type of impact and the populations and infrastructure impacted.
- CP4b: Evaluate the accessibility of emergency response services for vulnerable populations in Manhattan Beach considering the needs of seasonal residents and visitors, older adults, children, lower-income families, and linguistically isolated families.
- CP4c: Evaluate the effectiveness of early emergency warning systems. Use this system to provide emergency warnings for extreme heat events, poor air quality days, flooding events, and coastal flooding events. Ensure that these warnings are provided in multiple languages and are easy to locate and access for both residents and visitors.

Extreme Heat (EH)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 3: A community with clean air

Goal 7: City populations and neighborhoods that are resilient to climate change hazards

Goal 8: Buildings and infrastructure that are resilient to climate change

Extreme Heat: Here's What You Can Do

1. Purchase a climate-friendly air conditioning unit. Prepare yourself for days with high temperatures and poor air quality so that you can close your windows and protect your indoor air quality.

2. Make sure your vulnerable neighbors have a way to access a cool place to relax during extreme heat days. Help them figure out a plan to get to a cooling center, library, or other area with air conditioning during extreme heat days.

3. Plant trees to provide more shade on sunny days and mitigate urban heat islands.

4. Install a green roof or cool roof to provide additional cooling and energy efficiency in your home.

As outlined in Chapter 4, data is not available for Manhattan Beach households that lack access to air conditioning at home, however, the City does currently have one designated cooling center available to residents during extreme heat events (Joslyn Community Center). While the southern portion of the City has a relatively low level of tree canopy, the City does have a Tree Ordinance and Urban Forestry Program.

Regarding extreme heat, public workshop participants were the most interested in policies to expand trees and green spaces as well as policies to invest in renewable energy, battery storage, and backup power sources for the City. Community members were also supportive of more cool roofs, reflective pavement, and green roofs.

CITY STRATEGIES TO INCREASE RESILIENCE

EH1: Ensure that all community members have access to cool locations during extreme heat events.

- Action EH1a: Promote improved access to cooling during heat events, particularly for the most vulnerable populations, ensuring adequate geographic distribution of facilities and accessible hours of operation. Measures can include providing access to on-site cooling such as residential air conditioners, emergency generators, and cooling centers or resilience hubs. Prioritize areas with higher proportions of older adults, children, and lower-income individuals.
- Action EH1b: Create an extreme heat plan that identifies publicly accessible locations with air conditioning that the public can use during extreme heat events. Identify public transportation options that can be used to access these locations. The plan should include a communication plan to disseminate this information to vulnerable populations during extreme heat days.
- Action EH1c: Install refillable water stations at parks, trailheads, community centers, and sport courts/fields with available water supplies to encourage proper hydration and protection against heat-related illness.
- Action EH1d: Plant trees along bike and pedestrian paths that lead to key amenities to provide cooling during extreme heat days.

EH2: Mitigate the urban heat island effect.

- Action EH2a: Expand the use of cool roofs, reflective building materials, and cool porous pavement materials.
- Action EH2b: Amend the local development code to require high-reflectivity pavement or increased tree cover for large parking lots.

EH3: Ensure that community infrastructure is resilient to extreme heat events.

- Action EH3a: Invest in sustainable backup power sources to provide redundancy and continued services for critical facilities during periods of high demand in extreme heat events.
- Action EH3b: Explore options to create a resilient, local energy system including establishing energy storage, the potential for renewable energy, and distributed energy systems.

Air Pollution (AP)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 3: A community with clean air

Goal 8: Buildings and infrastructure that are resilient to climate change

As outlined in Chapter 4, the City's low level of tree canopy increases the City's vulnerability to poor air quality. Additionally, residents without air conditioning are at greater risk when extreme heat events overlap with periods of poor air quality.

Manhattan Beach community members are enthusiastic about expanding green spaces and green infrastructure, ensuring that facilities have adequate air filtration, and monitoring the health of vulnerable individuals during poor air quality events.

CITY STRATEGIES TO INCREASE RESILIENCE

AP 1: Expand green infrastructure across the City.

- Action AP1a: Develop a free residential yard tree program in partnership with nonprofits (e.g., TreePeople), to distribute trees to residents. Prioritize homes in communities along the northern border of the City and in areas with low tree canopy.
- Action AP1b: Continue to support and expand the Urban Forestry Program, ensuring that it promotes a diverse urban forest with thresholds for species diversity. Focus tree planting efforts in the western areas of the City which have lower tree canopy. Establish a goal for percent tree canopy in each neighborhood. Amend the program to encourage alternative vegetative solutions such as green walls and green roofs where trees are not possible.
- Action AP1c: Pilot a community garden. Consider locations which are accessible by public transportation.
- Action AP1d: Pilot green roofs or green walls on City buildings.
- Action AP1e: Attain the status of a "Tree City" as recognized by the Arbor Day Foundation by establishing a City tree board or department, implementing a community tree ordinance, spending at least $2 per capita on urban forestry, and celebrating Arbor Day, which can become a yearly tree giveaway event.

Air Pollution: Here's What You Can Do

1. Know your neighbors. Find out if there are any particularly vulnerable people in your neighborhood (elderly folks, people with pre-existing health conditions, people with limited mobility) and check in on them during days with poor air quality or extreme heat.

2. Reduce engine idling; Swap internal combustion engines such as vehicles, construction equipment, and lawn-mowers for electrical alternatives.

3. Fuel vehicles early in the morning or later in the evening as sunlight triggers ozone formation during fueling.

4. Limit your driving. Take public transportation, walk, or bike to reduce pollution from combustion engines.

AP2: Ensure access to clean air.

- Action AP2a: Pilot a neighborhood resilience hub. A resilience hub is typically housed in a trusted community-managed facility and is designed to engage community members in the adaptation process. A resilience hub may serve as a cooling center, provide shelter during climate events, distribute key necessities such as supplies, multilingual information and translation services, provide space for community programming, and provide access to broadband internet.
- Action AP2b: Provide access to air filters, resilience hubs with filtered air, or air masks during wildfire events and days with high levels of air pollution.

AP3: Reduce emissions from buildings and vehicles.

- Strategy B2 (Net-Zero Buildings) in Chapter 5 encourages electricity alternatives to help reduce reliance on natural gas in existing development with listed exceptions. In addition to reducing greenhouse gases, this strategy will improve local indoor air quality in residential, municipal, and commercial buildings. Additionally, Strategies V1 (Expand EV Charging Infrastructure) and V2 (Transition City Fleet and Transit to EVs) support the City's transition to zero-emission vehicles which will improve air quality across the City, addressing the existing high levels of diesel PM experienced in the City (as identified in Chapter 4) and increasing the City's resilience to days of poor air quality.

Sea Level Rise (SR)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 7: Populations and neighborhoods that are resilient to climate change

Goal 8: Buildings and infrastructure that are resilient to climate change

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

Sea Level Rise: Here's What You Can Do

1. Be aware of king tides and coastal storm patterns.

2. Engage with coastal restoration projects near your community. Understand how restoration projects make our communities more resilient.

3. Greenhouse gas emissions lead to climate change which fuels sea level rise. By taking simple steps such as driving less and reducing your energy consumption, you can reduce your contribution to emissions that lead to sea level rise.

Manhattan Beach is in the process of implementing a Sea Level Rise Adaptation Plan which focuses specifically on how to prepare the community for the impacts of sea level rise. In alignment with this commitment, the City Council unanimously adopted amendments to the Local Coastal Program (LCP) in the spring of 2022. This strategic update addresses coastal hazards and rising sea levels. The City's attention to understanding community vulnerabilities to sea level rise and adapting to rising sea levels

increases the City's associated adaptive capacity. Additionally, while some coastal assets will be difficult to relocate and have a low adaptive capacity (such as the stormwater system, sewer main line, food shack, and restrooms), the beach overall is a relatively wide beach and will remain (although narrower) as sea levels rise. Overall, community members are enthusiastic about nature-based adaptation solutions such as dune restoration, offshore reefs and kelp beds, and beach nourishment. Most of the following adaptation measures are drawn from the adaptation strategies proposed in the *City of Manhattan Beach Sea Level Rise Adaptation Plan*.

CITY STRATEGIES TO INCREASE RESILIENCE

SR 1: Increase the resiliency of the beach.

- Action SR1a: Continue the City's work on the Manhattan Beach Dune Restoration Project to mitigate backshore erosion, maintain a wider beach, and provide coastal resiliency and storm protection. Pursue beach dune restoration in other areas of the City and consider implementing foredune restoration in addition to the backdune restoration on which the pilot project is focused.
- Action SR1b: Create winter beach berms to provide protection against flooding and waves during winter coastal storms while balancing detrimental impacts of berms on nearshore ecological communities.
- Action SR1c: Consider beach nourishment in coordination with sand retention measures in order to reduce the risk of flooding and erosion while increasing sediment supply, beach width, and dynamic coastal processes. Coordinate beach nourishment measures with LA County Department of Beaches and Harbors and the California Coastal Sediment Workgroup.
- Action SR1c: Consider sand retention strategies such as groins and reefs, kelp beds, and eelgrass beds.

SR 2: Ensure that community infrastructure is resilient to sea level rise.

- Action SR2a: Elevate or waterproof assets or infrastructure in concert with protective measures such as beach dune restoration and beach nourishment.
- Action SR2b: Raise buildings, trails, utilities such as pipelines, or storm drains that are vulnerable to flooding erosion, or increased groundwater levels.
- Action SR2c: Relocate buildings and infrastructure that are at risk of coastal flooding to a less hazardous area. Adapt beach events to a narrower beach over time.
- Action SR2d: Consider sea level rise in future feasibility assessments for stormwater infrastructure projects.
- Action SR2e: Monitor the impacts of coastal storms on the South Bay Cities' Main Sewer Trunk Line including impacts to access and increased flows in the system.

SR 3: Ensure that the coastal planning process is accessible to all communities.

- Action SR3: Maximize opportunities for the public to participate in and inform coastal planning processes that affect recreational resources, including both residents of coastal communities and those who visit the coast to recreate, such as inland communities.

Extreme Drought (ED)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 6: Sustainable production and consumption of resources

Goal 7: Populations and neighborhoods that are resilient to climate change

Goal 8: Buildings and infrastructure that are resilient to climate change

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

Providing access to a clean and reliable water supply is an essential public service. The ability of the City to do this is threatened by drought. As outlined in Chapter 4, the City is in the early stages of considering the effect of climate change on water supply. However, the City's main water suppliers, West Basin Municipal Water District (WBMWD) and Metropolitan Water District (MWD), have developed Water Shortage Contingency Plans and water conservation measures that consider the impact of climate change on water supply. In 2021, Manhattan Beach became the first "Blue City" certified by the non-profit organization Project O, recognizing the City's excellence in waste minimization, climate protection, community resilience, water quality and efficiency, and the promotion of healthy ecosystems. Additionally, the City's permanent water conservation requirements will make the City more resilient to changes in water supply.

Drought: Here's What You Can Do

1. Choose appliances that are more energy and water efficient. Check plumbing for leaks and have them repaired.

2. Plant native and/or drought tolerant grasses, plants, and ground cover.

3. Consider investing in water harvesting.

To increase resilience to drought, workshop participants expressed the most support for planting climate-appropriate, drought-tolerant native species and increasing the City's use of reclaimed water.

CITY STRATEGIES TO INCREASE RESILIENCE

ED1: Use scarce water resources more efficiently.

- Action ED1a: Update the City's Water Conservation Ordinance as necessary to reflect current best practices.
- Action ED1b: Adopt water-neutral new development ordinances.

- Action ED1c: Encourage the planting of drought tolerant and California native plants and the use of alternative irrigation techniques to reduce water consumption.

ED2: Increase potable water reuse and recycling.

- Action ED2a: Increase the use of recycled water in City operations.
- Action ED2b: Develop or expand community-scale water recycling program.
- Action ED2c: Expand education and outreach regarding water conservation and water reuse. Host events to educate and encourage residents to adopt water saving techniques in their homes and gardens.

ED3: Incorporate climate change considerations into local and regional water resource planning.

- Action ED3a: Continue to update City water resource planning documents to consider the impact of climate change on City water use and resources.
- Action ED3b: Continue to participate in regional water resource planning efforts, especially those that consider strategies to adapt to climate change. Coordinate with neighboring jurisdictions to adopt climate adapted water management practices that reduce reliance on imported water.

Extreme Storms and Stormwater Flooding (SF)

IMPLEMENTATION OF THESE STRATEGIES SUPPORTS

Goal 7: Populations and neighborhoods that are resilient to climate change

Goal 8: Buildings and infrastructure that are resilient to climate change

Goal 9: Resilient parks, beaches, and public spaces that provide recreation, ecological habitat, and carbon sequestration benefits

Extreme storms can create dangerous conditions and are expected to increase in the future. As discussed in Chapter 4, the City's land cover is approximately 58 percent impervious, which reduces the ability for stormwater to percolate into the ground and increases risk of flash flooding events. Additionally, the City's stormwater drainage system is expected to be overwhelmed by more extreme storms and is further threatened by rising sea levels.

To increase resilience to extreme storms and flooding, workshop participants were the most interested in strategies that increase permeable surfaces using pervious pavements and low impact development techniques in addition to conserving natural permeable areas.

Extreme Storms: Here's What You Can Do

1. Incorporate stormwater capture features into landscaping, such as a rain garden, bioswale, or berm.

2. Replace impervious surfaces on your property with permeable pavement or green spaces.

3. Assemble an emergency supply kit in case you need to evacuate. Plan an evacuation route and sign up for emergency alerts regarding floods.

CITY STRATEGIES TO INCREASE RESILIENCE

SF1: Increase the permeability of hardscape surfaces in Manhattan Beach to mitigate stormwater runoff.

- Action SF1a: Continue to require new development and redevelopment projects to incorporate green streets BMPs.
- Action SF1b: Encourage the use of permeable surfaces and green infrastructure in and around City facilities.

SF2: Ensure that community infrastructure is resilient to extreme storms and stormwater flooding.

- Action SF2a: Prioritize low-impact development (LID) stormwater practices in areas where storm drains may be impaired by high water due to sea level rise.
- Action SF2b: Protect critical evacuation routes at risk or identify alternative routes outside flood hazard zones.
- Action SF2c: Provide early warning systems and alerts; improve access to hazard information.

SF3: Monitor the impacts of flooding and incorporate into capital improvements.

- Action SF3a: Establish a flood impacts monitoring program.
- Action SF3b: Conduct a study of the stormwater management system to evaluate its capacity to handle increased stormwater flows and the cost and benefits of potential adaptation strategies.

CHAPTER 7

Plan Implementation and Monitoring

This chapter focuses on how the City will implement the strategies and actions laid out in Chapter 5 (for reducing GHG emissions) and Chapter 6 (for increasing community resilience), and track progress towards carbon neutrality by 2045. Translating strategies and actions into actual emission reductions will require development or adjustment of programs, City staff time to promote and implement the various measures, and effective systems for tracking and monitoring their implementation. Coordination between City departments and collaboration with residents, businesses, regional organizations, and other government agencies will be needed to ensure that programs are well-managed and cost-effective.

It is important to acknowledge the important role that behavior change has in reducing community GHG reductions. Community involvement has been important to the development of the CAAP and will continue to be an essential component of the implementation process, as many strategies depend on active participation by residents and businesses. The City will be making a concerted effort to develop and strengthen community education and awareness through various promotional efforts. The City's website will also be updated to communicate program development and gauge the success of CAAP implementation.

Schedule and Responsibilities

For the most part, the City will be responsible for initiating the local measures to reduce emissions. However, success for many measures will ultimately depend on public participation. Actions that require active City promotion may require updates to the City website, distribution of promotional materials, and other active City outreach activities. The City will develop programs to reach the public, including public forums, workshops, and meetings; these programs will be administered with the intent to foster an open public input and commenting process. Collaboration and coordination with regional agencies and institutions such as the South Bay Cities Council of Governments (SBCCOG), Beach Cities Transit, and Clean Power Alliance (CPA) will also be essential to successful CAAP implementation.

Coordination with outside agency participation and regional partnerships is mentioned explicitly in the strategy descriptions included in Chapter 5, and the City will continue to explore opportunities for collaboration.

Table 7-1 provides a summary of the key implementation components for each local measure described in Chapter 5, including implementation timeframe and objectives (i.e., the monitoring criteria). The implementation timeline is organized as follows: Ongoing (current); Near-term (2025–2027), Mid-term (2028–2031), and Long-term (beyond 2031) actions. The schedule also highlights the City department(s) responsible for spearheading implementation efforts, and the quantifiable objectives for each strategy against which successful implementation will be gauged. Actual implementation will depend on a variety of factors, including availability of funding and City staff time, shifting community priorities, and changing environmental conditions.

Table 7-1 GHG Reduction Measure Implementation Summary

MEASURE	2030 ANNUAL GHG REDUCTIONS ($MTCO_2e$)[a]	IMPLEMENTATION TIMEFRAME	RESPONSIBLE DEPARTMENT	2030 OBJECTIVES
Clean Energy Systems (E)				
E1: Procure Zero-Carbon Electricity	36,767	Ongoing	Community Development, Public Works	Community: Maintain at least 95% participation in CPA's 100% Green Power tier through 2030. Municipal Ops: Maintain 100% participation in CPA's 100% Green Power tier through 2030.
E2: Increase Local Solar Energy Generation	Not quantified	Ongoing	Community Development, Public Works	Community: Double the community's total solar PV system capacity (based on 2019 levels). This includes residential and non-residential solar PV systems. Municipal Ops: Double the City's total solar PV system capacity (based on 2019 levels). This includes all municipal properties within the City.
E3: Develop Energy Storage/Microgrids	Not quantified	Mid-term	Environmental Sustainability, Public Works	Community: Achieve community electricity storage capacity equal to the city-wide 24-hour average usage. Municipal Ops: Begin implementation of a microgrid project for a critical facility by 2030 through the CPA's Power Ready Program.

MEASURE	2030 ANNUAL GHG REDUCTIONS ($MTCO_2e$)[a]	IMPLEMENTATION TIMEFRAME	RESPONSIBLE DEPARTMENT	2030 OBJECTIVES
Green Buildings (B)				
B1: Improve Efficiency of Existing Buildings	6,689	Ongoing	Community Development, Public Works	Community: Reduce the energy intensity (consumption per square foot) of existing (as of 2019) residential buildings by 15%; Reduce the energy intensity (consumption per square foot) of existing commercial buildings by 15%. Municipal Ops: Reduce the energy intensity of existing (as of 2019) municipal buildings by 20%.
B2: Net-Zero Buildings	5,026	Near-term	Community Development, Public Works	Community: Incentivize the use of electric appliances in new residential and commercial construction by the year 2030, with exceptions for stoves and outdoor fireplaces. Municipal Ops: Evaluate electrification alternatives for all proposed new municipal facilities.
Zero-Emission Vehicles (V)				
V1: Expand EV Charging Infrastructure	49,523	Long-term	Public Works	Consistent with the Statewide goal, increase the amount of publicly accessible EV charging stations to 600 by 2030; Achieve community-wide 25% EV fleet penetration by 2030 (13% as of 2022).
V2: Transition City Fleet (and Transit) to EVs	Not quantified	Ongoing	Public Works	Municipal Ops: Consistent with CARB's Advanced Clean Fleets Regulation, achieve 50% electric-powered or zero emissions municipal fleet and equipment by 2030.
Smart Mobility (M)				
M1: Expand Infrastructure for Pedestrians, Bikes, and Micro-Mobility Solutions	Not quantified	Ongoing	Community Development, Public Works	Zero fatal accidents involving pedestrians and bicyclists. Increase existing Class I bike path miles by 10% and Class II bike lane miles by 25%.
M2: Improve Transit Effectiveness and Accessibility	Not quantified	Mid-term	Community Development, Public Works	Increase local transit ridership by 20 percent. Provide transit stop amenities (refuse cans, benches, and shelters) to all bus stop locations.
M3: Support Mixed-Use Development Downtown and Along Transit Corridors	Not quantified	Near-term	Community Development	Adopt mixed-use development standards into the City's Zoning Code.
M4: Embrace Mobility as a Service	Not quantified	Mid-term	Community Development	Expand travel options that don't require personal vehicle ownership.

MEASURE	2030 ANNUAL GHG REDUCTIONS ($MTCO_2e$)[a]	IMPLEMENTATION TIMEFRAME	RESPONSIBLE DEPARTMENT	2030 OBJECTIVES
Water Conservation & Reuse (W)				
W1: Increase Water Conservation	572	Near-term	Public Works	Reduce community per capita water use by 10%.
W2: Decrease Carbon Intensity of Delivered Water	Not quantified	Near-term	Public Works	Increase City use of recycled water or graywater to 20% of total water demand.
Waste Reduction and Recycling (R)				
R1: Increase Recycling and Organic Waste Diversion	Not quantified	Ongoing	Public Works	Community: Reduce community-wide organic waste disposal by 75% from 2014 levels by 2025 in alignment with SB 1383. Municipal Ops: Reduce municipal organic waste disposal by 75% from 2014 levels by 2025 in alignment with SB 1383.
Nature-Based Solutions (N)				
N1: Increase Local Carbon Sequestration	Not quantified	Near-term	Community Development, Parks and Recreation, Public Works	Increase the City's tree canopy cover by 5% using native and drought-resistant species.

NOTE:
a – $MTCO_2e$ represents metric tons of carbon dioxide equivalent.

Tracking Progress

City staff will annually present updates to the City Manager and the City Council that summarize CAAP implementation progress. The report will evaluate the successes and challenges in meeting the performance objectives established in Chapter 5 and summarize progress toward the City's GHG reduction targets. City staff will provide the status of implementation (e.g., initiated, ongoing, completed), assess the effectiveness of the strategies and programs included in the Plan against the established performance objectives, and recommend adjustments to programs or measures as needed. The annual report will also assess whether the City's actual growth and development is consistent with the forecasts made in this CAAP.

An update of the City's GHG inventory and comprehensive revision of the CAAP should occur at least every four years to monitor progress of GHG reductions against the City's targets.

Transportation and Land Use: Longer Term Considerations

As introduced in Chapter 1, SB 32 established a target to reduce statewide GHG emissions by 40 percent below 1990 levels by 2030, and AB 1279, signed in 2022, established a longer-term GHG reduction target of 85 percent below 1990 levels by 2045 as well as statewide carbon neutrality through the use of carbon sequestration and atmospheric carbon removals. This CAAP provides a roadmap for the City to achieve GHG reductions consistent with the Statewide SB 32 and AB 1279 targets and for accomplishing the deep reductions needed to help meet the State's 2045 goal of carbon neutrality. The ability to achieve these longer-term targets is highly dependent on technological developments and strong leadership at the federal and state levels, but it will also require extensive changes to local development patterns and transportation systems. It is appropriate for the City to plan for this challenge now, as profound changes to local land use, transportation modes, and community behavior could require decades of planning, public engagement, and policy development.

As a sector, Transportation and Land Use represents perhaps the biggest challenge to meeting the State's 2045 reduction target, and to local efforts to reduce emissions. SB 375 (Sustainable Communities and Climate Protection Act of 2008) mandates GHG reductions from transportation, assigning reduction targets to SCAG and the rest of the State's 18 Metropolitan Planning Organizations (MPOs) for emissions from on-road transportation vehicles, but like all cities in California, Manhattan Beach retains authority over local land use authority. As the state continues to develop its longer-term policies and strategies for reducing emissions, the City of Manhattan Beach will continue its longer-term visioning on how future growth and development can be accommodated while still reducing GHG emissions.

This CAAP provides a framework for a more in-depth discussion on ways to accommodate future growth sustainably and reduce local dependence on single-occupancy vehicle (SOV) travel. As described in Chapter 5, the strategies under Smart Mobility (M) are intended to decrease the need for motor vehicle travel through mixed-use development along transit corridors, better transit access, and pedestrian- and bicycle-friendly design, while the strategies for Zero-Emission Vehicles (V) and Clean Energy Systems (E) support the transition to transportation modes powered by renewable electricity. Whereas many of these measures currently rely on voluntary actions and behavior change, GHG reductions over the long term can be greatly enhanced through municipal codes, ordinances, and other regulatory means.

Funding Sources and Partnerships

The City will use a combination of City staff time, grant funding, direct spending, and collaboration with other agencies and organizations to achieve CAAP goals. In addition to the program implementation costs to the City, there will be costs borne by residents and businesses to comply with its requirements. The City's costs for implementation may include the creation or promotion of voluntary programs, continuing administration of those programs, coordination and outreach with other government agencies and businesses, and—in some cases—exploration or study of potential regulatory mechanisms not yet codified. Some strategies require up-front capital expenditures by the City.

The GHG reduction measures in this document were formulated with an understanding that the City has limited staff time and financial resources to implement them. Cost-effectiveness estimates are based on the anticipated impact to the City budget, including any upfront capital investment needed to implement a strategy, ongoing annual costs, and City staff time required. As shown in Table 7-1, staff from the Community Development Department are slated to implement the majority of the CAAP measures. The Public Works Department, the Parks and Recreation Department, and the City Manager's Office will also contribute. Promotional activities are likely to require significant City staff time and will require updating the City website, public outreach campaigns (e.g., workshops), dissemination of promotional materials (e.g., flyers), and other forms of public awareness, outreach, and education.

A list of potential partners, programs, and funding sources is listed below in Table 7-2. Federal, State, and regional agencies and organizations provide grants and loans, as well as planning assistance, for investments in a variety of climate-related projects. Grants and loans can provide short-term funding for program development and program testing, and could help pay for the staff time required to develop programs, and then establish an alternative financial framework for the program's continued operation after the grant expires.

Table 7-2 Potential Funding Sources to Support CAAP Implementation

PROGRAM	DESCRIPTION
Federal Programs	
Carbon Dioxide Transportation Infrastructure Finance and Innovation (CIFIA) Program	Administered by the U.S. Department of Energy, the CIFIA program extends loans and loan guarantees to support projects that involve the delivery of infrastructure (e.g., pipeline, shipping, rail, or other infrastructure) and associated equipment for the transportation of carbon dioxide. Eligible CIFIA projects must have project costs in excess of $100 million, and while project proposals must be submitted by a public entity, contracts are with private entities through public-private partnership arrangements.
Electric Vehicles Tax Credits (Inflation Reduction Act of 2022)	The Inflation Reduction Act of 2022 extends tax credits for EVs and establishes new tax credits for used EVs and commercial EVs: • Light Duty EV Tax Credit: Up to $7,500 to switch to an EV, extended through 2032. • Used EV Tax Credit: For the first time, used EVs will be eligible for federal tax credits of up to $4,000 or 30% of the sales price, whichever is lower. The sales price must be less than $25,000 and the vehicle must be at least two years old. • Commercial EV and Fuel Cell EV Tax Credit: New tax credit available to businesses, up to 15% for plug-in hybrid EVs and up to 30% for EVs and fuel cell EVs. As of December 2022, the credit extends to commercial and tax-exempt entities, making government entities eligible to claim the credit. The credit is up to $7,500 for vehicles under 14,000 pounds and up to $40,000 for all other vehicles. • EV Charging Equipment Tax Credit: Federal tax credit on charging equipment in low-income or non-urban areas that has been extended through 2032. For individual/residential uses, the tax credit remains unchanged at 30%, up to $1,000. For commercial uses, the tax credit is 6%, with a maximum credit of $100,000 per unit. • Clean Heavy-Duty Vehicles: $1 billion allocated to replace Class 6 and 7 heavy-duty vehicles with clean EVs. These rebates can be used for up to 100% of the costs for vehicles, infrastructure, training, and planning and technical activities to support electrification. • Diesel Emissions Reduction Act Program: $60 million to fund grants and rebates that protect human health and improve air quality by reducing harmful emissions from diesel engines. • Domestic Manufacturing Conversion Grants: $2 billion in cost-shared grants for domestic production of efficient hybrid, plug-in electric hybrid, plug-in electric drive, and hydrogen fuel cell EVs. • Advanced Technology Vehicle Manufacturing Program: $3 billion to originate, underwrite, and service loans to eligible automotive manufacturers and component manufacturers to finance the cost of re-equipping, expanding, or establishing manufacturing facilities in the U.S. to produce Advanced Technology Vehicles and qualifying components. • Advanced Manufacturing Production Credit: A long-term extension of this tax credit for investments in manufacturing facilities for clean energy technologies.
Energy Efficient Mortgages	The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program that helps current or future homeowners save money on their utility bills by enabling borrowers who might not otherwise qualify for conventional loans to finance energy efficient improvements on affordable terms with their FHA mortgage. Qualified homebuyers or homeowners are automatically pre-approved for an additional 5-15 percent of their approved loan to do energy-efficient repairs to their home without adding to their debt-to-income ratio. The EEM program recognizes that an energy-efficient home will have lower operating costs, making it more affordable for the homeowner.
ENERGY STAR® Portfolio Manager®	Portfolio Manager is a free tool supported by the United States Environmental Protection Agency (U.S. EPA) that measures a building's energy performance and compares it to other similar buildings. It allows building owners and managers to track energy use and verify improvements. Approximately 40 percent of U.S. commercial building space is benchmarked in Portfolio Manager — making it the industry-leading benchmarking tool.

PROGRAM	DESCRIPTION
Energy-Efficient Commercial Buildings Tax Deduction	The Energy-Efficient Commercial Buildings Tax Deduction incentivizes designers to meet or exceed an agency's energy reduction requirements for new and existing buildings. The Energy Policy Act of 2005 allows building owners to receive a tax deduction (codified in U.S. Code Title 26, Section 179D) for expenses incurred for qualified energy-efficient building investments. In government-owned buildings, the government may allocate this deduction to the person(s) primarily responsible for designing the improvements. The deduction may be taken in the year the energy-efficient improvements are placed in service.
Federal Inflation Reduction Act	The Inflation Reduction Act, signed in August 2022, includes nearly $400 billion in climate-related funding, prioritizing projects that repurpose retired fossil fuel infrastructure and employ displaced workers. The Inflation Reduction Act builds on the initial climate funding opportunities passed into law in the Infrastructure Investment and Jobs Act to support projects across EV charging, power infrastructure, and climate resilience, such as: • Energy Cost Investments for home energy rebate programs focusing on low-income consumers, to electrify home appliances, implement energy efficiency retrofits, and make affordable housing more energy efficient. This also provides for 10 years of consumer tax credits to make homes energy efficient and run on clean energy, and consumer tax credits for lower/middle-income individuals to buy used clean vehicles and new clean vehicles. • American Energy Security and Domestic Manufacturing provides production tax credits to accelerate U.S. manufacturing of clean technology manufacturing facilities, estimated to invest $30 billion. This includes credits for solar panels, wind turbines, batteries, and critical minerals processing. There are also grants and loans for existing auto manufacturing facilities to manufacture clean vehicles and to build new clean vehicle manufacturing facilities, as well as funding to accelerate breakthrough energy research. • Economy Decarbonization provides tax credits for clean sources of electricity and energy storage, and approximately $30 billion in targeted grant and loan programs for states and electric utilities to accelerate the transition to clean electricity. Tax credits and grants support clean fuels and clean commercial vehicles to reduce emissions from all parts of the transportation sector and from industrial manufacturing processes, as well as accelerate deployment of technologies to reduce emissions. • Environmental Justice grants provide opportunities for community-led projects to address disproportionate impacts related to pollution and climate change. This includes block grants and neighborhood access and equity grants for community capacity building centers, reconnecting communities divided by existing infrastructure barriers, mitigating negative impacts of transportation facilities or construction projects on underserved communities, and supporting equitable transportation planning and community engagement activities. There is also grant funding to support reduced air pollution through purchase and installation of zero-emission equipment and technology at ports, and clean heavy-duty vehicles, like school and transit buses and garbage trucks. • Farmers, Forestland Owners, and Resilient Rural Communities provides grant opportunities to support healthy forests, forest conservation, and urban tree planting. Tax credits and grants are also available to support the domestic production of biofuels, and to build the infrastructure needed for sustainable aviation fuel and other biofuels. Other grants available focus on conservation and restoration of coastal habitats and protection of communities that depend on those habitats.
Federal Infrastructure Investment and Jobs Act	The Federal Infrastructure Investment and Jobs Act, passed in 2021, authorizes approximately $550 billion in new federal investment in America's transportation, communication, and water infrastructure, with much of the funding geared toward the clean energy transition and to increasing resilience to climate change. The legislation includes the following: • $39 billion of new investment to modernize transit and improve accessibility for the elderly and people with disabilities. • $7.5 billion to build a national network of electric vehicle chargers. • $73 billion for power infrastructure and the clean energy transmission. • $110 billion for roads, bridges, and other major projects. • $11 billion in transportation safety programs. • $39 billion in transit modernization and improved accessibility.

PROGRAM	DESCRIPTION
Federal Solar Investment Tax Credit	The federal residential solar energy credit is a tax credit that can be claimed on federal income taxes for a percentage of the cost of a solar PV system. The system must be placed in service during the tax year and generate electricity for a home located in the United States. In December 2020, Congress passed an extension of the investment tax credit, which provides a 26% tax credit for systems installed in 2020–2022 and 22% for systems installed in 2023. (Systems installed before December 31, 2019, were eligible for a 30% tax credit.) The tax credit expires starting in 2024 unless Congress renews it.
Greenhouse Gas Reduction Fund	The Inflation Reduction Act amended the Clean Air Act to create a new program: the Greenhouse Gas Reduction Fund. This first-of-its-kind program will provide competitive grants to mobilize financing and leverage private capital for clean energy and climate projects that reduce GHG emissions—with an emphasis on projects that benefit low-income and disadvantaged communities—and further the Biden-Harris Administration's commitment to environmental justice. The Greenhouse Gas Reduction Fund provides $27 billion to U.S. EPA for expenditure until September 30, 2024. This includes: • $7 billion for competitive grants to enable low-income and disadvantaged communities to deploy or benefit from zero-emission technologies, including distributed technologies on residential rooftops; • Nearly $12 billion for competitive grants to eligible entities to provide financial and technical assistance to projects that reduce or avoid GHG emissions; and • $8 billion for competitive grants to eligible entities to provide financial and technical assistance to projects that reduce or avoid GHG emissions in low-income and disadvantaged communities.
Justice40 Investments	Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, established the Justice40 Initiative, which directs 40% of the overall benefits of certain federal investments—including investments in clean energy and energy efficiency; clean transit; affordable and sustainable housing; training and workforce development; the remediation and reduction of legacy pollution; and the development of clean water infrastructure—to flow to disadvantaged communities. Through the President's Inflation Reduction Act, Bipartisan Infrastructure Law, and the American Rescue Plan, federal agencies are making historic levels of investment to advance environmental justice.
Low Income Home Energy Assistance Program (LiHEAP)	LIHEAP is a federal program administered by U.S. Department of Health and Human Services that provides assistance to eligible low-income households to manage and meet their immediate home heating and/or cooling needs. LIHEAP offers several of services to help low-income households meet their home energy needs: • The Home Energy Assistance Program, which provides one-time financial assistance to help balance an eligible household's utility bill. • The Energy Crisis Intervention Program, which provides assistance to low-income households that are in a crisis situation, such as households receiving a 24- to 48-hour disconnect notice or service termination by their utility company, or households facing an energy-related crisis that could be deemed potentially life-threatening, such as a combustible appliance. • LIHEAP Weatherization, which provides free energy efficiency upgrades to lower monthly utility bills and improve household health and safety. • Energy budget counseling, and education on basic energy efficiency practices and instruction on the proper use and maintenance of installed weatherization measures.
Low-Income Solar and Wind Investment Tax Credit	This investment tax credit is currently a 30% federal tax credit claimed against the tax liability of residential (under Section 25D) and commercial and utility (under Section 48) investors in solar energy property. The Section 25D residential investment tax credit allows homeowners to apply the credit to their personal income taxes. This credit is used when homeowners purchase solar systems and have them installed on their homes. In the case of the Section 48 credit, the business that installs, develops, and/or finances the project claims the credit.

PROGRAM	DESCRIPTION
Moving Ahead for Progress in the 21st Century (MAP-21)	Federal funding through the MAP-21 program is administered through the state and regional governments. MAP-21 funding is administered through Caltrans, MPOs (SCAG in Southern California) and RTPAs (RCTC in Riverside County). Most of the funding programs are transportation versus recreation oriented, with an emphasis on reducing auto trips and providing an intermodal connection. In most cases, MAP-21 provides matching grants of 50 to 100 percent.
Pollution Prevention (P2) Grant Program	P2 grants provide technical assistance to businesses to help them develop and adopt source reduction practices (also known as "pollution prevention" or "P2"). "P2" means reducing or eliminating pollutants from entering any waste stream or otherwise released into the environment prior to recycling, treatment, or disposal.
Reconnecting Communities Pilot Program — Planning Grants and Capital Construction Grants	The Bipartisan Infrastructure Law established the new Reconnecting Communities Pilot discretionary grant program, funded with $1 billion over the next 5 years. It is the first-ever federal program dedicated to reconnecting communities that were previously cut off from economic opportunities by transportation infrastructure. Funding supports planning grants, capital construction grants, and technical assistance to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities.
Renewable Electricity Production Tax Credit	The renewable electricity production tax credit is a per-kWh federal tax credit included under Section 45 of the U.S. tax code for electricity generated by qualified renewable energy resources. It provides a corporate tax credit of 1.3 cents/kWh for electricity generated from landfill gas, open-loop biomass, municipal solid waste resources, qualified hydroelectric, and marine and hydrokinetic (150 kilowatts or larger). Electricity generation from wind, closed-loop biomass, and geothermal resources results in a corporate tax credit of as much as 2.5 cents/kWh.
Resilient and Efficient Codes Implementation	$225 million for the Infrastructure Investment and Jobs Act to advance state and local jurisdiction efficiency and resilience of building energy codes, as well as provide long-term sustainability of measures and savings, and address equity, energy, environmental justice, and resilience priorities. Funding is appropriated for "eligible entities to enable sustained cost-effective implementation of updated building energy codes" through a competitive grant process over five years (Fiscal Years 2022 through 2026). Awardees eligible for this funding must include a relevant state agency, and priority will be given to teams that include strategic partnerships, such as a local building code agency, codes and standards developers, associations of builders and design and construction professionals, and many others. Projects must be tied to an updated building energy code, which includes any amendment or code update resulting in increased energy efficiency as compared to the previously adopted code.
Safe Routes to Schools	Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bike to school by funding projects that remove barriers to doing so. These barriers include a lack of infrastructure and non-infrastructure projects, safety, and limited programs that promote walking and bicycling. In California, two separate Safe Routes to School programs are available at both the state and federal level, and both programs fund qualifying infrastructure projects.
Source Reduction Assistance Grant Program	Source reduction assistance grants can support research, experiments, surveys, demonstration projects, education, and training related to source reduction approaches, which is also known as "pollution prevention" or "P2."

PROGRAM	DESCRIPTION
U.S. Department of Energy (DOE)	The Federal government including DOE provides grants and other financial incentives to local governments for renewable energy installations. Information regarding programs is available at http://www.grants.gov. DOE's Zero-Emission Transit Bus Tax Exemption exempts zero-emission transit buses from state sales and use taxes when the buses are sold to public agencies in California. Through the Hybrid and Zero Emission Truck and Bus Voucher Incentive Project and Low Oxides of Nitrogen (NOx) Engine Incentives, CARB provides vouchers to eligible fleets to reduce the incremental cost of qualified electric, hybrid, or natural gas trucks and buses at the time of purchase. Vouchers are available on a first-come, first-served basis. The DOE Loan Programs Office provides loan guarantees for innovative clean energy projects, fossil projects, nuclear projects, and energy infrastructure reinvestment projects under the Title 17 Innovative Clean Energy Loan Guarantee Program, authorized by the Energy Policy Act of 2005. Title 17 helps eliminate gaps in commercial financing for energy projects in the United States that utilize innovative technology to reduce, avoid, or sequester greenhouse gas emissions. Projects for funding include the following: • Renewable Energy and Efficiency Energy projects finance catalytic, replicable, and market ready renewable energy and efficient energy technologies with $4.5 billion of available loan guarantees. Technology areas of interest include Advanced Grid Integration & Storage; Drop-In Biofuels; Waste-to-Energy; Enhancement of Existing Facilities; and Efficiency Improvements. • Advanced Fossil Energy projects have the potential to reduce carbon emissions in hard-to decarbonize sectors. Eligible projects can utilize any fossil fuel and may come from across the spectrum of production and use, including resource development, energy generation, and end use. The four technology areas of interest are Advanced Resource Development, Carbon Capture, Low-Carbon Power Systems, and Efficiency Improvements. • The Carbon Dioxide Transportation Infrastructure program offers access to capital for large capacity, common-carrier CO2 transport projects (e.g., pipelines, rail, shipping, and other transport methods).
United States Department of Housing and Urban Development	The City implements their Home Improvement Program which supports the implementation of energy efficient upgrades to qualifying low-to-moderate income households in owner-occupied single-family homes. The program is funded by the Department of Housing and Urban Development (HUD) through allocation of the HOME Investment Partnerships Program (HOME) formula grants.
USDA Supplemental Nutrition Assistance Program-Education (SNAP-Ed)	SNAP-Ed is a federally funded grant program that supports evidence-based nutrition education and obesity prevention interventions and projects for persons eligible for SNAP through complementary direct education, multi-level interventions, and community and public health approaches to improve nutrition.
USDA Water & Waste Disposal Loan & Grant Program	This program provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and stormwater drainage to households and businesses in eligible rural areas. Eligibility includes most state and local governmental entities, private nonprofits, and federally recognized tribes.
WaterSense	WaterSense is a voluntary partnership program sponsored by the U.S. EPA, is both a label for water-efficient products and a resource for helping residents and businesses save water.

PROGRAM	DESCRIPTION
State Programs	
CAL FIRE	The CAL FIRE Urban and Community Forestry Program focuses on use of trees and associated vegetation to provide multiple benefit solutions and to mimic the functions of natural forests in neighborhoods. CAL FIRE offers grants to eligible applicants on an annual basis, as funding permits. These grants are designed to assist communities to create or implement multi-benefit projects with a focus on GHG emissions and providing benefits to disadvantaged communities. The Urban and Community Forestry Grant is provided to communities and projects that achieve multiple objectives for community protection, including vegetation management, fire risk reduction, GHG reductions, and habitat improvement.
California Air Resources Board (CARB)	CARB offers several grants, incentives, and credits programs to reduce on-road and off-road transportation emissions. Residents, businesses, and fleet operators can receive funds or incentives depending on the program. • California Vehicle Rebate Program (CVRP) provides up to $7,000 for recipients to purchase or lease a new plug-in hybrid electric vehicle (PHEV), battery electric vehicle (BEV), or a fuel cell electric vehicle (FCEV). The CRVP prioritizes low-income recipients. Similarly, the Clean Vehicle Assistance program provides grants and affordable financing to help California residents with gross household incomes less than or equal to 400 percent of the federal poverty level to purchase a new or used hybrid or electric vehicle. The Clean Cars 4 All Program supports lower-income consumers upgrade to cleaner technology vehicles by retiring their older, higher-polluting vehicles. Participants also have the option to replace older vehicles for alternative mobility options, such as public transit passes or electric bicycles. • The Carl Moyer Program provides funding to replace older heavy-duty diesel vehicles and equipment with cleaner technologies, primarily in environmental justice and low-income communities. CARB provides the Low Carbon Transportation Investments and Air Quality Improvement Program which provides mobile source incentives to reduce GHG, criteria pollutant, and toxic air contaminant emissions through the deployment of advanced technology and clean transportation in the light-duty and heavy-duty sectors. • The Clean Off-Road Equipment Voucher Incentive Project promotes the purchase of clean technology over internal combustion options, targeting commercial-ready off-road products that have not yet achieved a significant market foothold. • The Bus Replacement Grant Program offers grants for the purchase of new zero-emission buses to replace old gasoline, diesel, compressed natural gas, or propane buses. The Lower-Emission School Bus Program provides funds to purchase new buses to replace old, high-emitting public school buses. The Hybrid and Zero Emission Truck and Bus Voucher Incentive Project accelerates commercialization by providing point-of-sale vouchers to make advanced vehicles more affordable. • The $1 billion Proposition 1B Goods Movement Emission Reduction Program is a partnership between CARB and local agencies, air districts, and seaports to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors. • Air Quality Improvement Program (AB 118) is a voluntary incentive program administered by the Air Resources Board to fund clean vehicle and equipment projects, research on biofuels production and the air quality impacts of alternative fuels, and workforce training. • Clean Mobility Options Voucher Pilot Program funds zero-emission mobility projects such as car sharing, bike sharing, vanpooling, ride-on-demand services, and innovative transit services in disadvantaged communities. The Car Sharing and Mobility Options program provides funding for bike share options in low-income areas.
California Climate Investments	CCI uses proceeds from the Cap-and-Trade program to facilitate comprehensive and coordinated investments throughout California to further the State's climate goals. Through funding from the Greenhouse Gas Reduction Fund (GGRF), CCI offers the following incentive programs • The California Vehicle Rebate Program provides funding for recipients to purchase or lease a new PHEV, BEV, or FCEV. • The Clean Vehicle Assistance Program provides grants and affordable financing to help low-income Californians purchase a new or used hybrid or electric vehicle. • Various programs promoting clean energy and energy efficiency.

PROGRAM	DESCRIPTION
California Department of Conservation	The Multibenefit Land Repurposing Program funds groundwater sustainability projects that reduce groundwater use, repurpose irrigated agricultural land, and provide wildlife habitat. The program seeks to increase regional capacity to repurpose agricultural land to reduce reliance on groundwater while providing community health, economic well-being, water supply, habitat, and climate benefits.
California Department of Housing and Community Development (HCD) Local Early Action Planning (LEAP) Grant	The LEAP Program provides over-the-counter grants complemented by technical assistance to local governments for the preparation and adoption of planning documents and process improvements that: • Accelerate housing production. • Facilitate compliance to implement the sixth-cycle Regional Housing Needs Assessment. Increasing the availability of affordable homes statewide is critical to bettering the quality of life of all Californians and to ending homelessness. In the 2019–20 Budget Act, Governor Gavin Newsom allocated $250 million for all regions, cities, and counties to do their part by prioritizing planning activities that accelerate housing production to meet the identified needs of every community. With this allocation, HCD established the LEAP Program with $119 million for cities and counties. LEAP provides one-time grant funding to cities and counties to update their planning documents and implement process improvements that will facilitate the acceleration of housing production and help local governments prepare for their sixth-cycle Regional Housing Needs Assessment much like the SB 2 Planning Grants.
California Department of Community Services and Development	The Low Income Weatherization Program (LIWP) supports owners and residents to lower utility costs, save energy, and reduce GHG emissions from multifamily properties. The LIWP is funded by the California Department of Community Services and Development and covers approximately 30-100 percent of energy efficiency upgrade costs for low-income residents within disadvantaged communities. The program also provides free property assessments, design assistance, and contractor coordination.
California Department of Fish and Wildlife (CDFW)	The CDFW implements a number of programs to support green infrastructure, parks, urban forestry and agriculture; and ultimately reduce GHG emissions. • Funding opportunities for multi-benefit ecosystem restoration and protection projects under both Proposition 1 and Proposition 68. Funding focuses on planning, implementation, and acquisition projects across multiple priorities. • The Wetlands Restoration for Greenhouse Gas Reduction Program restores wetland ecosystems to provide essential services to California's people, wildlife, and fish. Wetlands have high carbon sequestration rates that can store carbon for decades. This program is part of California Climate Investments (CCI).
California Department of Food and Agriculture (CDFA)	CDFA's Alternative Manure Management Program provides financial assistance for the implementation of non-digester manure management practices to help reduce GHG emissions. The Fertilizer Research and Education Program funds research and education to advance the environmentally safe and agronomically sound use and handling of fertilizing materials.
California Department of Motor Vehicles	California's Motor Vehicle Registration Fee Program provides funding for projects that reduce air pollution from on- and off-road vehicles. Eligible projects include purchasing alternative fueled vehicles and developing alternative fueling infrastructure. Grant funding and distribution information is available from local air districts and on the program's website.
California Department of Resources Recycling and Recovery (CalRecycle)	CalRecycle grant programs allow jurisdictions to assist public and private entities in management of waste streams. Incorporated cities and counties in California are eligible for funds. Program funds are intended to: • Reduce, reuse, and recycle all waste • Reduce landfill disposal of organics, including food waste • Encourage development of recycled-content products and markets • Protect public health and safety and foster environmental sustainability

PROGRAM	DESCRIPTION
California Department of Transportation (CalTrans)	Caltrans offers funding programs to support implementation of bicycle and pedestrian infrastructure: • The Active Transportation Program (ATP) funds bike and pedestrian infrastructure projects, educational and promotional efforts, safe routes to school projects, and active transportation planning. The state awards half of the funds through a competitive grants process. Forty percent goes to metropolitan agencies to distribute and ten percent goes to rural areas. At least 25% of all funds must benefit residents in disadvantaged communities. • Sustainable Communities Grants to encourage local and regional planning that further state goals related to sustainability, preservation, mobility, safety, innovation, economy, heath, and social equity. • The Strategic Partnerships Grants help to identify and address statewide, interregional, or regional transportation deficiencies on the State highway system in partnership with Caltrans. This program also funds transit-focused planning projects that address multimodal transportation deficiencies. • Transportation Development Act (TDA) Article 3 (SB 821) funding, also known as the Local Transportation Fund (LTF), is used by cities for the planning and construction of bicycle and pedestrian facilities.
California Energy Commission (CEC)	The CEC provides funding opportunities and loan programs to support electric vehicle charging infrastructure, alternative fuel technologies, and microgrid projects, including: • The Southern California Incentive Project, offered through the California Electric Vehicle Infrastructure Project (CALeVIP) program, offers rebates of up to $70,000 per DC fast EVSE installation at new sites and 75% of total project costs, and up to $40,000 per DC fast EVSE installation at replacement or make-ready sites. Installations in disadvantaged communities are eligible for rebates for 80% of the total project cost, up to $80,000 per DC fast EVSE, regardless of installation site type. • The California Capital Access Program (CalCAP) provides small business borrowers and lenders incentives to finance the design, development, purchase, and installation of EV charging stations in California. • The CEC's Clean Transportation Program (also known as Alternative and Renewable Fuel and Vehicle Technology Program) invests up to $100 million annually to support innovation and accelerate the development and deployment of advanced transportation and fuel technologies. • The CEC is also the primary funder of the state's advanced microgrid projects, and to date has dedicated $84.5 million in matching funding to develop 20 projects across the state. The CEC also provides loan programs through the Energy Conservation Assistance Act (ECAA) that support energy efficiency and energy generation projects: • The ECAA-Ed program provides zero-interest rate loans to public school districts, charter schools, county offices of education, and state special schools. • The ECAA Low-Interest Loans program provides one percent interest loans to local governments, special districts, public colleges and universities, public care institutions, and public hospitals for energy retrofits and some new construction projects.
California Natural Resources Agency	The Natural Resources Agency offers a variety of grant and loan programs within its departments and conservancies. Programs include but are not limited to the following: • The Urban Greening Grant Program funds projects that reduce GHG emissions by sequestering carbon, decreasing energy consumption, and reducing vehicle miles traveled. • The Environmental Enhancement & Mitigation Program funds projects that contribute to mitigation of the environmental effects of transportation facilities. These include urban forestry projects designed to offset vehicular emissions of carbon dioxide. • The Urban Green Infrastructure Program provides funding for multibenefit green infrastructure investments in or benefiting disadvantaged or severely disadvantaged communities.

PROGRAM	DESCRIPTION
California Public Utilities Commission (CPUC)	CPUC administers several programs to incentivize electrification, reduce GHG emissions, and support lower income households: • $200 million for the Technology and Equipment for Clean Heating and Building Initiative for Low Emissions Development programs, to cut carbon emissions in buildings and low-income households from fossil fuel combustion. • The California Solar Initiative provides incentives to low-income customers installing solar PV systems and to all utility customers installing solar water heating systems. The California Solar Initiative has a Single-family Affordable Solar Homes Program, managed by GRID Alternatives, that provides qualified low-income homeowners fixed, upfront, capacity-based incentives to help offset the upfront cost of a solar electric system. • The Self-Generation Incentive Program provides incentives to support existing, new, and emerging distributed energy resources, with rebates for qualifying distributed energy systems installed on the customer's side of the utility meter. Qualifying technologies include wind turbines, waste-heat-to-power technologies, pressure reduction turbines, internal combustion engines, microturbines, gas turbines, fuel cells, and advanced energy storage systems. • A $1 billion investment has been made over five years for the statewide Transportation Electrification Program to help accelerate EV adoption, with 70% of the funds to go toward charging for medium- and heavy-duty vehicles and 30% to go toward light-duty charging at or near multiunit dwellings. The program offers rebates for customer-side ("behind-the-meter") EV infrastructure investments at commercial, industrial, and residential sites beginning in 2025 and provides higher rebates for projects in underserved, disadvantaged, and tribal communities. • The California Alternate Rates for Energy (CARE) program offers up to 35% discounts on electric bills and a 20% discount on natural gas bills for qualifying lower-income households. • The Family Electric Rate Assistance Program offers an 18% discount on electricity bills for households whose income slightly exceeds CARE allowances.
California State Board of Equalization	Section 73 of the California Revenue and Taxation Code allows a property tax exclusion for qualifying new solar installations, meaning that property taxes will not increase for individuals if they install solar on their property. This tax exclusion was set to expire in 2016, but is now extended through January 1, 2025.
California State Transportation Agency (CalSTA)	The Transit and Intercity Rail Capital Program (TIRCP) was created by Senate Bill 862 to provide grants from the state's Greenhouse Gas Reduction Fund (GGRF) to fund transformative capital improvements that will modernize California's intercity, commuter, and urban rail systems, and bus and ferry transit systems. The aim is to reduce GHG emissions by reducing congestion and vehicle miles traveled throughout California. The 2023 program includes approximately $1.3 billion for seven projects in the six-county SCAG region, to improve regional transportation and reduce GHG emissions, congestion, and vehicle miles traveled. The funding includes $600 million for the East San Fernando Valley Transit Corridor, part of the Los Angeles County Metropolitan Transportation Authority transit network.
Energy Upgrade California	Energy Upgrade California is a statewide program that educates California residents about opportunities to manage energy-use, identify clean-energy options, and find rebates and incentives to increase energy-efficiency. The program is supported by the CPUC, CEC, various utilities, regional energy networks, Community Choice Aggregation, businesses, nonprofits, and local governments. The Gateway Cities Energy Leader Partnership offers assistance in understanding this program and finding contractors who can assess and complete projects that are funding-eligible. Funding is provided by investor-owned energy utility customers under the auspices of the CPUC and the CEC.

PROGRAM	DESCRIPTION
Integrated Climate Adaptation and Resiliency Program (ICARP)	The ICARP Grant Programs aim to address local, regional, and tribal adaptation planning and resilience needs. • Adaptation Planning Grant Program provides funding to communities for identifying climate resilience priorities and developing a pipeline of climate resilient infrastructure projects. • Regional Resilience Planning and Implementation Grant Program focuses on funding regional climate resilience efforts, including capacity building and project implementation to address a region's greatest climate risks. • Extreme Heat and Community Resilience Program supports initiatives at the local, regional, and tribal levels to mitigate the impacts of extreme heat, coordinating state efforts to address both extreme heat and the urban heat island effect.
Strategic Growth Council (SGC)	SGC offers a variety of grant programs to support environmental, land use, and urban greening improvements in communities: • The Affordable Housing and Sustainable Communities Program (AHSC) is administered by the SGC and implemented by the Department of Housing and Community Development (HCD). The AHSC Program funds land-use, housing, transportation, and land preservation projects to support infill and compact development that reduce GHG emissions. Funding for the AHSC Program is provided from the GGRF. • The Transformative Climate Communities (TCC) Program funds community-led development and infrastructure projects that achieve major environmental, health, and economic benefits in California's most disadvantaged communities. Funded by California's Cap-and-Trade Program, TCC empowers the communities most impacted by pollution to choose their own goals, strategies, and projects to enact transformational change – all with data-driven milestones and measurable outcomes. • SGC's Urban Greening Grant Program funds urban greening projects and plans that reduce energy consumption, conserve water, improve air and water quality, and provide other community benefits. These funds assist entities in developing a master urban greening plan that will ultimately result in projects to help the State meet its environmental goals and the creation of healthy communities. These funds also assist entities to preserve, enhance, increase or establish community green areas such as urban forests, open spaces, wetlands and community spaces (e.g., community gardens).
Regional Programs	
Clean Power Alliance (CPA)	CPA is the community choice aggregation (CCA) serving local businesses and residents in the greater Los Angeles County, including City of Manhattan Beach. CPA offers a variety of programs and funding sources geared towards local renewable energy generation and storage as well as demand response management. In 2017, the City joined CPA, and starting in October 2021 the default service for all customers became 100% Green Power, relying entirely on renewable energy procured by CPA.
Metropolitan Water District of Southern California (MWD)	SoCal Water$mart program is a partnership between the MWD and its 26 member agencies including West Basin Municipal Water District, to fund home and business rebates.
Proposition A Local Return transit fund	Approved by voters in November 1980, Proposition A is a half-cent sales tax dedicated to transportation funding and was the first of its kind to address transportation challenges in Los Angeles County. Proposition A has funded transportation projects, improved bus service, initiated plans for a rail system that continues to be expanded today, and helped subsidize fares. The Proposition A expenditure plan includes three categories: 25% to Local Return programs, 35% to rail development, and 40% to discretionary.

PROGRAM	DESCRIPTION
South Coast Air Quality Monitoring District (SCAQMD)	For the year 2018, AB 617 provided SCAQMD with $10.7 million in funding for SCAQMD to develop community emissions reduction plans, conduct community monitoring and analysis, and implement BARCT for facilities in the Cap and Trade program. With the passage of AB 617, the SCAQMD expects to receive $107.5 million in new funding for eligible projects under the Carl Moyer Program, to replace older heavy-duty diesel vehicles and equipment with cleaner technologies, primarily in environmental justice and low income communities. The SCAQMD and the Mobile Source Air Pollution Reduction Review Committee (MSRC) provides Clean Transportation Funding to support a variety of emission reduction programs including the Replace Your Ride Program and the Residential Electric Vehicle Charging Incentive Program. SCAQMD assists businesses with variety of financial incentives to reduce emissions through Vehicle and Engine Upgrade Programs, which include grants for incremental funding, subsidies, or vouchers, with many designed to promote voluntary introduction of new technologies on an accelerated schedule The SCAQMD offers multiple rebates to incentivize energy efficient upgrades and improve air quality within the region. • The Electric Lawnmower Rebate Program offsets the costs of purchasing an electric lawnmower. Participants can purchase a new electric lawnmower, turn in their old gasoline lawnmower to an approved dismantler for permanent destruction, and then receive a rebate based on the purchase price of the new electric lawnmower. • The CLEANair Furnace Rebate Program is implemented by Electric & Gas Industries Association (EGIA) that provides rebates to residents who purchase and install a compliant furnace that meets the SCAQMD Rule 1111 NOx emission limit.
Southern California Association of Governments (SCAG)	SCAG provides a variety of services to assist local jurisdictions with implementing bicycle infrastructure and to encourage the community to use active modes of transportation. • The Sustainable Communities Program provides direct technical assistance to jurisdictions to complete planning and policy efforts that enable implementation of the Regional RTP/SCS. • SCAG's Go Human program is a community outreach and advertising campaign with the goals of reducing traffic collisions in Southern California and encouraging people to walk and bike more. This program is funded by grants from the California Office of Traffic Safety, the California Active Transportation Program, the Mobile Source Air Pollution Reduction Review Committee, and other local sponsors. The program encourages active transportation through education, advocacy, information sharing, and events.

PROGRAM	DESCRIPTION
Southern California Edison (SCE)	SCE offers tools and resources that enable residential customers and businesses to manage costs, reduce energy usage, and get payment assistance, including: • The Energy Savings Assistance program is available to certain homeowners and renters who receive electric services through a residential meter and have an SCE account. • For businesses, SCE offers Continuous Energy Improvement, a free consulting service. • The Mobile Home Upgrade program offers no-cost energy conservation evaluations by an energy specialist to identify opportunities for energy reduction and savings on electricity bills. The program also offers energy efficiency installations and improvements and is available to mobile homes or mobile home communities that have an active SCE service account. • The Direct Install Program for businesses to reduce energy costs. Under this program, businesses receive an energy efficiency evaluation and installation of energy efficient equipment including LED lights, fluorescent lighting, hi-bay lighting, refrigeration, and LED signs. • SCE offers special electric vehicle Time-of-Use rate plans that offer reduced rates when customers charge during off-peak hours. • SCE customers can join SCE's Green Rate or Community Renewables Program to tap into the power of the sun through new renewable energy options without having to install their own solar panels. • SCE's Net Energy Metering provides a rate option for customers that have a renewable energy system installed, and gives them credit on their energy bill for the surplus electricity supplied to the grid. • SCE's Home Efficiency Guide provides information regarding home energy use and conservation opportunities. The Home Efficiency Guide emphasizes the benefits of electric appliances including increased energy efficiency, energy bill reduction, improvements to indoor air quality, and overall environmental benefits.
Southern California Gas Company (SoCal Gas) / Sempra Energy	SoCalGas offers programs to single-family residential, multi-family residential and commercial customers to identify energy efficiency improvements that save money and energy. Cities can join a Local Government Partnership with SoCalGas to gain access to increased rebates and incentives, free facility audits, and assistance for community outreach/events. These programs are funded by California utility customers under the auspices of the CPUC. • The Energy Savings Assistance Program (ESAP) provides weatherization services to low-income households served by SCE who meet the CARE program income guidelines. • The Comprehensive Mobile Home Program offers no-cost energy conservation evaluations and energy efficiency installations such as low-flow showerheads and faucet aerators. The program also provides natural gas energy efficiency improvements such as duct tests and seal of HVAC systems. • The Commercial Direct Install (CDI) program offers long-term energy savings to qualifying customers. Through the CDI program, a trained energy efficiency representative will evaluate energy and water use to identify areas for businesses to save energy and water. • The Residential Direct Install program has no income requirements and is available to renters and homeowners living in single-family and multifamily dwellings. This no-cost program provides energy improvements to eligible customers to help make their homes more comfortable and help conserve energy, which could lead to lower utility bills. • The SoCalGas Marketplace is an online tool that features incentives for energy-efficient home appliances and consumer electronics. • SoCalGas offers a special residential Natural Gas Vehicle (NGV) billing rate for customers who choose this option. Refueling your NGV at home on this rate may yield a lower refueling cost compared with using a public station.
Private and Non-governmental Support	
Community-based non-profits	Community-based non-profits should be considered as resources for direct and indirect support, including funding, for program activation and operations. For example, GRID Alternatives helps provide access to clean, renewable solar energy to low-income families and hands-on job training to help workers enter the solar industry

PROGRAM	DESCRIPTION
Independent Energy Purchase/Solar Services Model	Local governments can finance solar PV system purchases and installations at no upfront cost by signing a long term power purchase agreement with a developer and agreeing to host a PV system at its facility. The developer pays for the design, construction and installation of the system, often arranging third party financing. The investor who provides the upfront capital and owns the project receives returns from payments from the host developer. The host's payments are at a predetermined fixed price and are assessed much like a monthly utility payment. The local government, as host, benefits from the fixed income price payments, reduced peaked energy costs and reduced GHG emissions all at no upfront cost.
Private investors	Private investors may provide funding to local governments. For example, energy service companies can finance the up-front investments in energy efficiency, reimbursed by the local government over a contract period. Private companies may finance solar power installations, and then recoup their investment by selling the resulting power to the building owner.

Additional Considerations

In addition to pursuing the funding options above, the City of Manhattan Beach may take the following steps to inform decisions related to the cost and implementation of GHG reduction measures.

Perform and refine cost estimates: Cost estimates for local reduction measures should be performed to identify the cost-effectiveness of each measure to inform and guide the implementation process. This analysis will likely be based on a variety of participation, per-unit, and other assumptions. As programs are developed, cost estimates should be refined and updated over time with more precise implementation-level data.

Integrate GHG measures into existing City budget and Capital Improvement Plan (CIP): Certain capital improvements, particularly those identified in Energy and Land Use/Transportation Measures, may need to be added to the City's CIP and facility master plan programs. Additionally, they may need to be incorporated into the City's utility enterprises and other public agencies (such as transit agencies) that have control for project implementation.

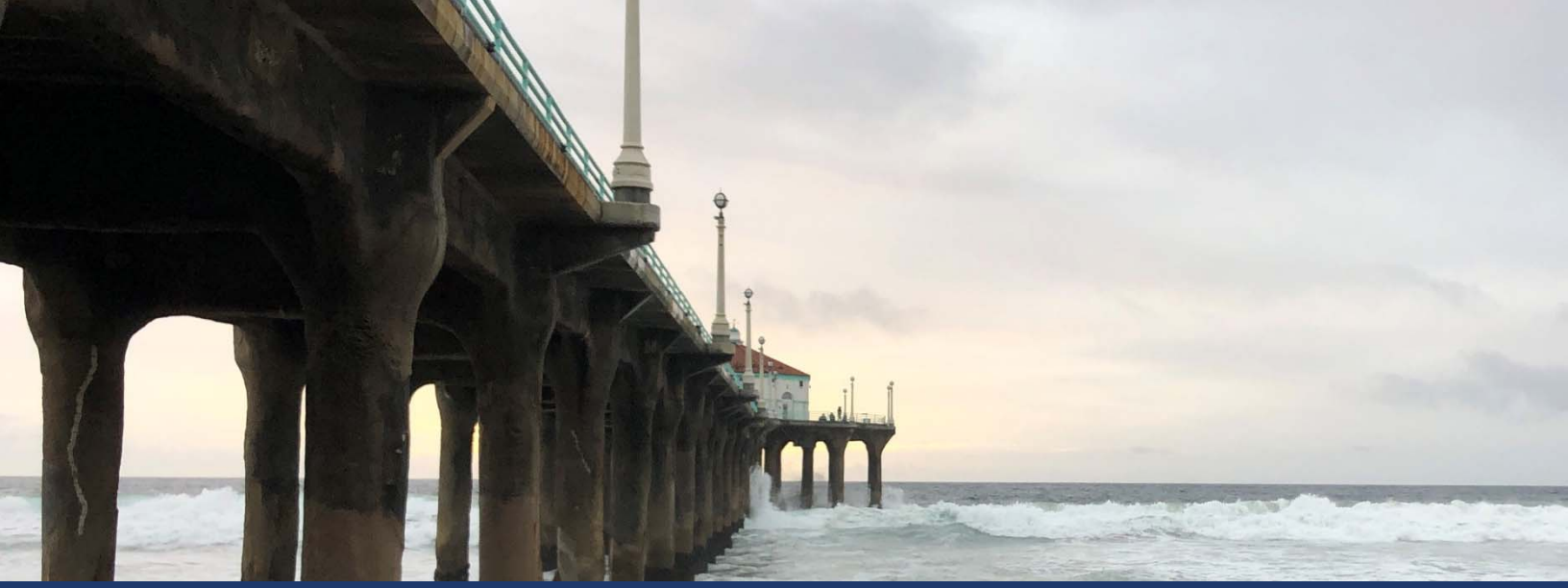
Adopt or update ordinances and/or codes: Some reduction measures may represent a continuation of recently enacted ordinances, while others would require new ordinances.

Implement and direct preferred City funding sources: As a part of its annual budget process, the City may appropriate funding from its general fund or make changes in its fee schedules, utility rates, and other sources as needed to support funding the implementation of the GHG reduction measures.

Identify economic and health indicators to expand potential future funding options: Identification and monitoring of economic and health indicators and trends, such as home prices, energy prices cost per kWh on solar installations, unemployment rates, or real wage increases, can guide the potential for funding local reduction measures through different financing mechanisms. Such indicators could be used to identify health and economic co-benefits of the CAAP, establish priorities, develop target resources, create benchmarks, and track progress towards community objectives.

CEQA Considerations

The CAAP is not an element of the City's General Plan or a regulatory document for the purposes of streamlining the California Environmental Quality Act (CEQA) process. Any policy, strategy, action, or ordinance described in the CAAP that is not already adopted must be developed and adopted through a public review process. In addition, future projects or physical improvements within the City, including those that are consistent with and implement the CAAP, would be subject to environmental review pursuant to CEQA including evaluation of GHG impacts, as appropriate.



CHAPTER 8
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