City of Laguna Beach

Climate Action and Adaptation Plan

February 2025

Prepared in collaboration with PlaceWorks, with support from Atlas Planning Solutions, Fehr & Peers, Nexus Planning and Research, and Optony.

"Investing in a Climate Action and Adaptation Plan is not just about addressing environmental challenges; it is about protecting our residents, businesses, and future generations from the risks of climate change while fostering a sustainable economy."

- *Alex Rounaghi, Laguna Beach Mayor*

"Our community thrives on its natural beauty and resources. A Climate Action and Adaptation Plan ensures we preserve what makes our city unique while preparing for the challenges ahead."

- *Hallie Jones, Laguna Beach City Councilmember*

"Resilience is not an option; it is a necessity. By adopting a Climate Action and Adaptation Plan, we safeguard our infrastructure, reduce costs, and create a pathway to a safer and more sustainable future."

- *Bob Whalen, Laguna Beach City Councilmember*

"Climate change affects us all, from rising energy costs to extreme weather events. A Climate Action Plan ensures that we tackle these challenges together, leaving no one behind."

- *Niko King, Fire Chief*

"Sustainability is smart business. A Climate Action and Adaptation Plan supports innovation and positions our city as a leader in clean energy and resilience."

- *Ed Steinfeld, Voice of Laguna*

"This plan is our commitment to future generations in our city. It represents the effort that the city is putting in to improve environmental resilience and move towards sustainability in Laguna Beach"

- *Kate Cheng, Laguna Beach High School Senior and Environmental Sustainability Committee Student Liaison*

"Laguna Beach's unique landscape demands a forward-thinking approach to both environmental protection and emergency preparedness. The Climate Action and Adaptation Plan will provide a roadmap to help safeguard our community from wildfire, and other climate-driven threats, helping to ensure a resilient future for all."

- *Shelly Bennecke, Resident, Chair, Emergency Disaster Preparedness Committee, Former Chair, Environmental Sustainability Committee*

"We cannot protect our residents, our homes, and our community without also protecting our environment – and vice versa. We are all part of one ecosystem."

- *Matt Lawson, Resident, Former Chair, Emergency Disaster Preparedness Committee*

"Each of us knows from both personal and professional experience the range of challenges we face from a changing climate, from the ever-present threat of wildfires to the erosion of our stunning land and ocean ecosystems. We are also keenly aware of the opportunities we have in front of us to minimize our individual and collective impacts on these environments. This plan lays out a roadmap for aggressive and decisive action to maintain Laguna Beach's leadership position in environmental sustainability and preparedness."

- *Steve Chadima, Resident, Environmental Sustainability Committee*

ACKNOWLEDGMENTS

The City of Laguna Beach extends its appreciation to all individuals and organizations who contributed to the development of this Climate Action and Adaptation Plan (CAAP). This plan is the result of collaboration, expertise, and community engagement, reflecting our shared commitment to a sustainable and resilient future.

We would like to express our gratitude to Mayor Alex Rounaghi and Mayor Pro Tem Mark Orgill as well as City Councilmembers Sue Kempf, Bob Whalen, Hallie Jones, and former Councilmember George Weiss for their leadership and vision in prioritizing climate action.

We are extremely grateful to our CAAP Working Group members Shelly Bennecke, Steve Chadima, Anne Girtz, Matt Lawson, Jacquelin Reed-Mutter, and Bill Niccum, who were heavily involved in the creation of the CAAP documents over the past 18 months. In addition, we would like to extend our appreciation to the Environmental Sustainability Committee and Emergency Disaster and Preparedness Committee for providing input during the CAAP presentations at four public meetings throughout the year. Their feedback and commitment to sustainability have played a vital role in ensuring that this plan addresses our city's unique needs and aspirations.

We would also like to thank our stakeholders that participated in the public engagement portion of the document including staff from the Climate Reality Project, Festival of the Arts, Laguna Bluebelt, Laguna Beach Cultural Arts Center, Laguna Canyon Foundation, Laguna Ocean Foundation, Southern California Edison, and Surfrider Foundation. Their expertise has been invaluable in shaping practical and impactful climate strategies.

We extend our gratitude to our consultant, PlaceWorks Inc., for their efforts in developing the plan, as well as to the subconsultants Fehr & Peers for their work on the Greenhouse Gas (GHG) Inventory Memo, Atlas Planning Solutions and Nexus Planning & Research for their support with the Vulnerability Assessment, and Optony Inc. for their contributions to the Microgrid Resiliency Report.

We would like to extend our appreciation to the community members, local businesses, advocacy groups, and nonprofit organizations who participated in public workshops and discussions. We also recognize the support of regional, state, and national agencies, as well as academic institutions, whose guidance and resources have strengthened our approach to climate resilience and emissions reduction.

We would also like to thank City staff across the departments responsible for implementing this plan, including Community Development, Cultural Arts, Public Works, Transit and Community Services, and the City Manager's Office.

We acknowledge the hard work of all those who have contributed to making this Climate Action and Adaptation Plan a reality. This plan represents a collective effort, and its success will depend on continued collaboration and dedication from all sectors of our community.

Together, we are taking a step toward a more resilient and sustainable Laguna Beach.

MINUTE EXTRACT
LAGUNA BEACH CITY COUNCIL REGULAR MEETING

A Regular Virtual Meeting of the City Council of the City of Laguna Beach was called to order on Tuesday, February 25, 2025, in the City Hall, 505 Forest Avenue, Laguna Beach, California, Mayor Alex Rounaghi presiding.

ROLL CALL
PRESENT: COUNCILMEMBERS: Jones, Kempf, Whalen, Orgill, Rounaghi
ABSENT: COUNCILMEMBERS: NONE

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EXTRACT OF ITEM NO. 14

14. ADOPTION OF THE LAGUNA BEACH CLIMATE ACTION AND ADAPTATION PLAN AND DETERMINING THAT SUCH ADOPTION BE EXEMPT UNDER THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

Moved by Councilmember Bob Whalen, seconded by Mayor Alex Rounaghi, and carried unanimously 5/0 to:

(1) Adopt the Laguna Beach Climate Action and Adaptation Plan;

(2) Determine that such approval is exempt under the California Environmental Quality Act pursuant to State CEQA Guidelines Section 15307 and 15308; and

(3) Encourage collaboration among government entities.

Roll Call:
Ayes: Jones, Kempf, Whalen, Orgill, Rounaghi
Noes: NONE

STATE OF CALIFORNIA)
COUNTY OF ORANGE) ss.
CITY OF LAGUNA BEACH)

I, Cheryl Baldridge, Deputy City Clerk of the City of Laguna Beach, California, do hereby certify that the foregoing is a true and correct copy of the Minute Entry on record in my office.

IN WITNESS WHEREOF, I hereunto set my hand and affix the official seal of the City of Laguna Beach, California, on this 12th day of March, 2025.

Cheryl Baldridge, Deputy City Clerk

CITY OF LAGUNA BEACH INCORPORATED JUNE 29, 1927 ORANGE COUNTY, CALIFORNIA

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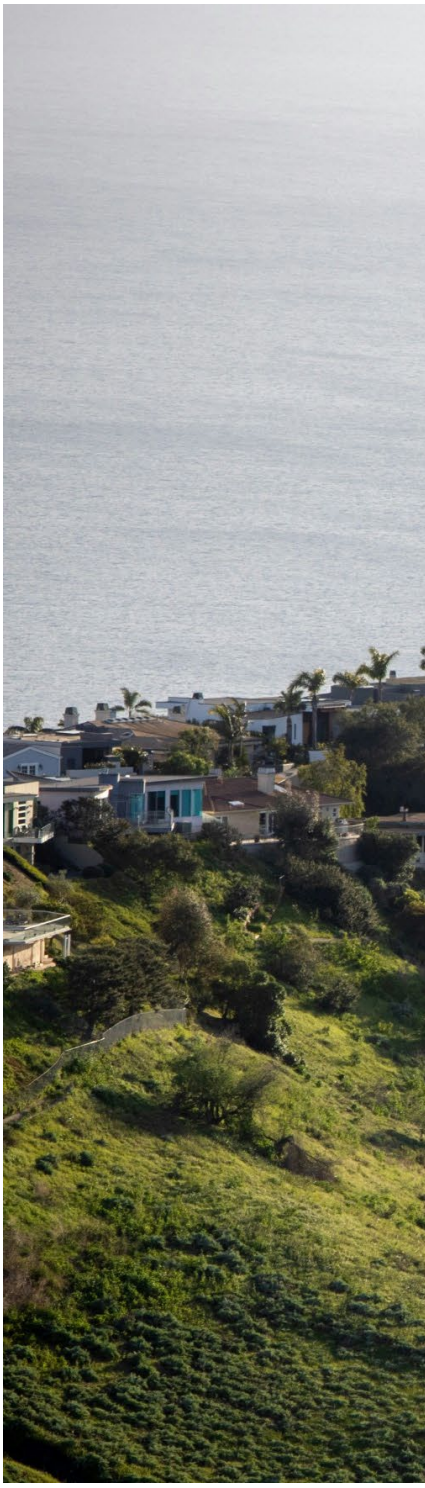

Tables

Figures

LIST OF ABBREVIATIONS

AB: Assembly Bill

AI: artificial intelligence

AQMD: Air Quality Management District

BAU: business-as-usual

CAL FIRE: California Department of Forestry and Fire Protection

CAP: Climate Action Plan

CAAP: Climate Action and Adaptation Plan

CCA: Community Choice Aggregation

CEQA: California Environmental Quality Act

CERT: Community Emergency Response Team

CH_4: methane

CO_2: carbon dioxide

CO_2e: carbon dioxide equivalent

CPAP: Climate Protection Action Plan

CWPP: Community Wildfire Protection Plan

e-bike: electric bicycle

EO: executive order

EV: electric vehicle (see Glossary)

GHG: greenhouse gas (see Glossary)

ICLEI: Local Governments for Sustainability

IPCC: Intergovernmental Panel on Climate Change

IRA: Inflation Reduction Act

kWh: kilowatt-hour

LCFS: Low Carbon Fuel Standard

LED: light-emitting diode

LEED: Leadership in Energy and Environmental Design

LGOP: Local Government Operations Protocol

LHMP: Local Hazard Mitigation Plan

$MTCO_2e$: metric tons of carbon dioxide equivalence (see Glossary)

N_2O: nitrogen dioxide

NOx: nitrogen oxides

OCTA: Orange County Transportation Authority

PCAP: Preliminary Climate Action Plan

PV: photovoltaic

RPS: Renewables Portfolio Standard

SB: Senate Bill

SCE: Southern California Edison

SDG&E: San Diego Gas and Electric

SoCalGas: Southern California Gas

SRA: State Responsibility Area

SUV: sport utility vehicle

VHFHSZ: Very High Fire Hazard Severity Zone

VMT: vehicle miles traveled (see Glossary)

ZEV: zero-emission vehicle (see Glossary)

GLOSSARY

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

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

Assets. A valued feature of a community that may be harmed by climate change. Assets may include buildings, infrastructure, community services, ecosystems, and economic drivers.[4]

Carbon neutral. Reducing GHG emissions to zero, either by eliminating all GHG emissions or by balancing out all remaining GHG emissions through carbon removal practices so that the "net" emissions are zero.

Carbon offsets. A reduction or removal of emissions of carbon dioxide or other GHGs made to compensate for emissions made elsewhere.

Carbon sequestration. The process of storing carbon dioxide in locations other than the atmosphere, where it cannot contribute to climate change or ocean acidification. For the purposes of this plan, carbon sequestration refers to the storage of atmospheric carbon in vegetation, soils, woody products, and aquatic environments.

Climate adaptation: Refers to the process of adjusting to the current or anticipated effects of climate change in order to reduce harm.

Climate change. A change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. In the context of this plan, the term refers to changes brought on by human activities.[5,6]

Climate mitigation: Refers to actions taken to reduce or prevent the emission of GHGs into the atmosphere.

Community benefit. An additional benefit occurring from the implementation of a GHG reduction measure that is not directly related to reducing GHG emissions.

Complete streets. A transportation facility that is planned, designed, constructed, operated, and maintained to provide comfortable and convenient mobility, and improve accessibility and connectivity to essential community destinations for all users, regardless of whether they are traveling as pedestrians, bicyclists, public transportation riders, or drivers. Complete streets are especially attuned to the needs of people walking, using assistive mobility devices, rolling, biking, and riding transit.[7]

Electric vehicle (EV). A zero-emission vehicle that uses electricity stored in a battery to power one or more electric motors and can be plugged in at home, work, fleet, or public charging stations.[8]

Equity. The state in which each individual or group is allocated the resources needed to reach an equal outcome.[9,10]

Exposure. The presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.[11]

Extreme event. When a weather or climate variable exceeds the upper or lower thresholds of its observed range.[12,13]

Extreme heat. Temperatures that are hotter than 98 percent of the historical high temperatures for the area, as measured between April and October of 1961 to 1990. In Laguna Beach, the extreme heat threshold is 88.1 degrees Fahrenheit.

Fire hazard severity zone. An area of significant fire hazard based on fuels, terrain, weather, and other relevant hazards.[14]

GHG emissions inventory. A quantified list of a community's GHG emissions and sources.[15]

Global warming potential (GWP). The ability of one unit of a GHG to trap heat in the atmosphere as compared to one unit of carbon dioxide over a given period. Used as a measure of how much a given mass of GHG is estimated to contribute to global warming.

Grey water. Untreated wastewater that has not been contaminated by toilet discharged; affected by infectious, contaminated, or unhealthy bodily wastes; and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes.[16]

Green infrastructure. Infrastructure that filters and absorbs stormwater where it falls.

Greenhouse gas(es) (GHGs). Greenhouse gases are gases that allow sunlight to pass through but reflect heat radiated from the Earth's surface, trapping heat in the lower atmosphere. Common GHGs include water vapor, carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). They may be emitted by natural or human processes.

Hazard. An event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural losses, damage to the environment, interruption of business, or other types of harm or loss.[17]

Hazard mitigation. Sustained action taken to reduce or eliminate the long-term risk to human life and property through actions that reduce hazard, exposure, and vulnerability.[18]

Impact (climate impact). The effects (especially the negative effects) of a hazard or other conditions associated with climate change.[19]

Inland flooding. The flooding that occurs away from coastal areas, often as a result of prolonged, heavy rainfall,

Internal combustion engine (ICE). An engine in which the expansion of high-temperature and high-pressure gases produced by combustion applies direct force to some component of the engine. Most ICEs are used in mobile applications and are the primary power supply for vehicles, such as cars, aircraft, and boats. ICEs are typically powered by hydrocarbon-based fuels like natural gas, gasoline, diesel fuel, or ethanol.

Metric tons of carbon dioxide equivalent ($MTCO_2e$). A measure used to compare emissions from different GHGs based on their global warming potential. The carbon dioxide equivalent for a gas is derived by multiplying the tons of gas by its associated global warming potential.

Micromobility. A mode of transportation that uses lightweight, usually powered, devices, such as electric scooters, electric-assist bicycles, and electric skateboards.

Natural gas. A naturally occurring mixture of gaseous hydrocarbons consisting primarily of methane. Natural gas is a nonrenewable fossil fuel resource.

Off-road equipment: Motorized equipment that is not driven on roads or is not used for on-road transportation. This includes outdoor landscaping and construction equipment, indoor and outdoor warehouse equipment, welding machines, and air pumps and compressors, among many others.

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

Resilience. The capacity of any entity—an individual, community, organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience. Community resilience is the ability of communities to withstand, recover, and learn from past disasters to strengthen future response and recovery efforts.[20,21,22]

Risk. The potential for damage or loss created by the interaction of hazards with assets such as buildings, infrastructure, or natural and cultural resources.[23]

Sea level rise. The worldwide average rise in mean sea level, which may be due to several different causes, such as the thermal expansion of sea water and the addition of water to the oceans from the melting of glaciers, ice caps, and ice sheets.[24]

Sensitivity. The level to which a species, natural system, community, or government would be affected by changing climate conditions.[25]

Severe weather. A dangerous meteorological phenomenon that poses a threat to life, property, or the environment, such as intense winds, lightning, and hail.

State Responsibility Area (SRA). The area in the state where the State of California has primary financial responsibility for the prevention and suppression of wildland fires.

Susceptibility. A person or population's potential for vulnerability due to demographic, socioeconomic, and geolocation characteristics.[26]

Sustainability. Sustainability is the ability to meet the needs of the present without compromising the ability of future generations to meet their own needs. In Laguna Beach, sustainability requires addressing the factors that influence the quality of the air, water, habitat, and ecological diversity upon which our community depends for public health, safety, and enjoyment. The community recognizes that equity is central to addressing impacts to the environment in a sustainable way. Sustainability requires equitably optimizing social and economic opportunities for all community members.

Urban heat island. The phenomenon in which large urban areas experience higher temperatures, greater pollution, and more negative health impacts during hot months due to a combination of heat-absorptive surfaces, heat-generating activities, and the absence of vegetation.[27]

Vehicle miles traveled (VMT). A key measure of overall street and highway use. Reducing VMT is often a major objective in efforts to reduce vehicular congestion and achieve regional air quality goals.

Vulnerability. Climate vulnerability describes the degree to which natural, built, and human systems are susceptible "…to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt."[28]

Vulnerability assessment. An analysis of how a changing climate may harm a community and which elements—people, buildings and structures, resources, and other assets—are most vulnerable to its effects based on an assessment of exposure, sensitivity, the potential impact(s), and the community's adaptive capacity.[29]

Zero-emission vehicle (ZEV). A vehicle that does not produce emissions when in operation, including battery-electric vehicles, plug-in hybrid vehicles, and hydrogen fuel-cell electric vehicles.[30]

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Executive Summary

EXECUTIVE SUMMARY

Why Should Our Community Adopt a Climate Action and Adaptation Plan?

As we release this Climate Action and Adaptation Plan, the United States faces a stark and urgent reminder of the consequences of a changing climate. Across the country, communities are grappling with record-breaking natural disasters—events that are growing more frequent, more severe, and more unpredictable. In California, these impacts are profoundly felt.

In Los Angeles County, wildfires rage in what was once considered an unimaginable season for such devastation. The Palisades Fire and the Eaton Fire, which tore through two communities in just hours. Pacific Palisades and Altadena mirror the vulnerability of places like Laguna Beach—communities nestled in wildland-urban interfaces that are increasingly at risk. These January wildfires starkly remind us that "fire season" is no longer a predictable period on the calendar but an omnipresent threat.

The destruction of homes, the displacement of families, limited water resources, and the strain on emergency responders are vivid illustrations of the challenges we face. The warming climate has extended the window for fire risk, dried out vegetation, and contributed to conditions that fuel these blazes. Such events are not isolated incidents; they are warnings of a future where inaction carries unimaginable costs.

This Climate Action and Adaptation Plan represents our commitment to safeguarding our community against these threats. It is not merely a document; it is a roadmap to resilience. Through actionable steps, we aim to reduce greenhouse gas emissions, protect vulnerable ecosystems, and adapt to the challenges of our evolving environment.

Laguna Beach has always been a community rooted in its connection to the natural world. Our cliffs, beaches, and open spaces define who we are and what we hold dear. But this identity comes with responsibility. By taking bold action today, we not only protect our way of life but also contribute to a larger, global effort to confront climate change.

The time to act is now. The lessons of the January 2025 fires echo loudly: preparedness, sustainability, and resilience are not optional—they are essential. We owe it to our residents, our neighbors, and future generations to rise to this challenge.

Together, we can chart a course toward a safer, more sustainable future for Laguna Beach.

What Is a Climate Action and Adaptation Plan?

A **Climate Action and Adaptation Plan (CAAP)** is a strategic framework that outlines how a city, its residents, and businesses will reduce greenhouse gas (GHG) emissions and prepare for the impacts of climate change through targeted policies, programs, and actions. It typically includes two major components:

1. **Climate Action (Mitigation)**

   - Focuses on **reducing** emissions that contribute to climate change.
   - Identifies strategies such as:
     - Transitioning to renewable energy sources.
     - Enhancing energy efficiency in buildings.
     - Improving public transportation and promoting active transportation (walking, biking).
     - Expanding electric vehicle infrastructure.
     - Implementing waste reduction and recycling programs.
     - Encouraging sustainable land use and development.

2. **Climate Adaptation (Resilience)**

   - Addresses how a community will **prepare for and respond to** climate-related hazards.
   - Identifies strategies such as:
     - Enhancing emergency response plans for wildfires, floods, and storms.
     - Strengthening infrastructure against extreme weather events.
     - Managing water resources for droughts and sea-level rise.
     - Increasing urban tree canopy to reduce heat island effects.
     - Protecting natural habitats that act as buffers against climate impacts.

Key Components of a CAAP (Included in this plan)

- **Greenhouse Gas Inventory**: Establishes a baseline for emissions.
- **Emissions Reduction Targets**: Sets specific goals (e.g., carbon neutrality by 2045).
- **Sector-Based Strategies**: Breaks down actions by category (transportation, energy, waste, etc.).
- **Implementation Plan**: Defines responsibilities, funding sources, and timelines.
- **Monitoring and Reporting**: Tracks progress and updates the plan as needed.

Many cities, including coastal communities like Laguna Beach, adopt CAAPs to align with statewide goals and enhance resilience against climate-related risks such as wildfires and sea-level rise.

What Are the City's GHG Emissions?

In Laguna Beach, GHG emissions come from daily activities like driving and using natural gas for heating. To set reduction goals, the City conducted GHG inventories for the community and its operations. Emissions totaled 179,580 metric tons of CO_2 equivalent ($MTCO_2e$) in 2018 and 189,410 $MTCO_2e$ in 2021, a 5 percent increase. This 2021 total is equivalent to burning 21.6 million gallons of gasoline, driving 574 million miles in an average passenger car, or the annual energy use of 52,870 average Laguna Beach homes. Offsetting these emissions would require growing 3.1 million tree seedlings for 10 years.

Figure ES-1: Community-Wide GHG Emissions for Laguna Beach in 2018 and 2021 ($MTCO_2e$)

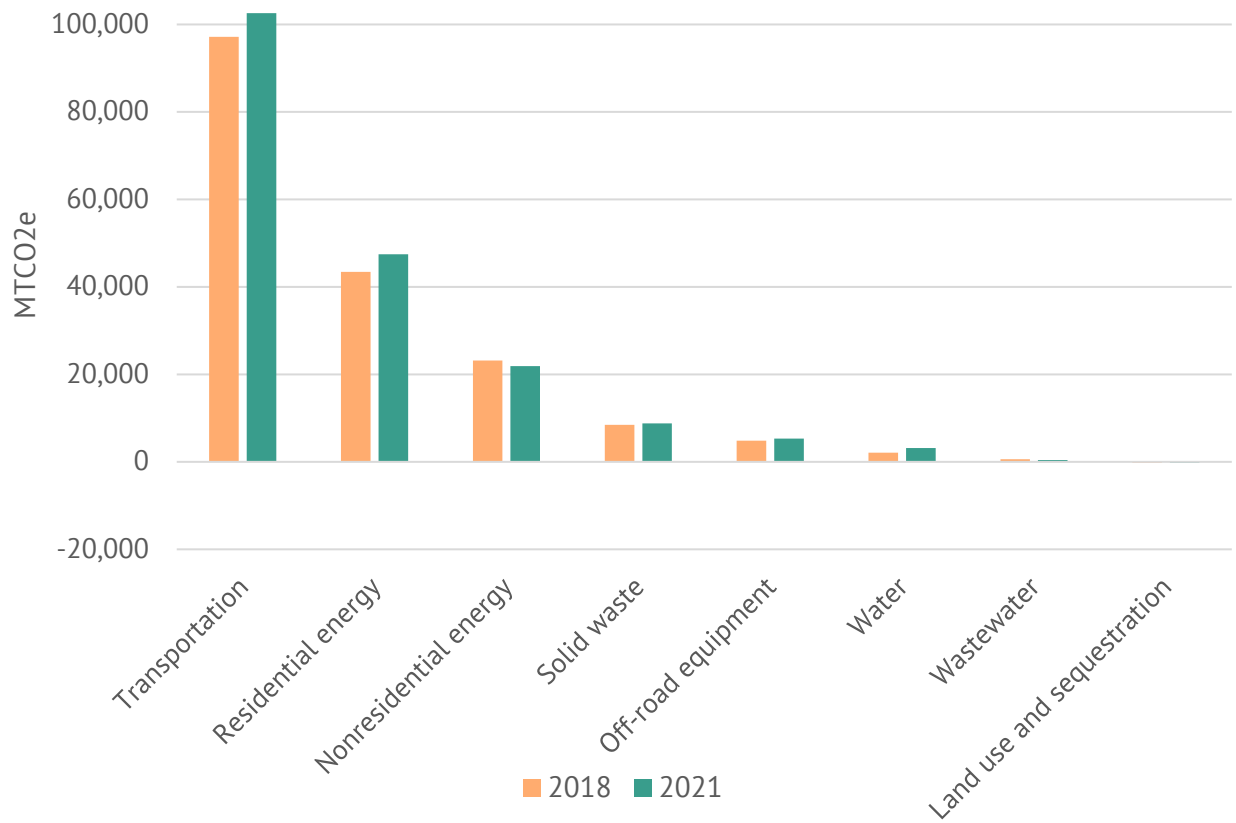


Figure ES-2: Laguna Beach Government Operations GHG Emissions in 2018 and 2021 ($MTCO_2e$)

What Are the Corresponding Community Vulnerabilities to Climate Change?

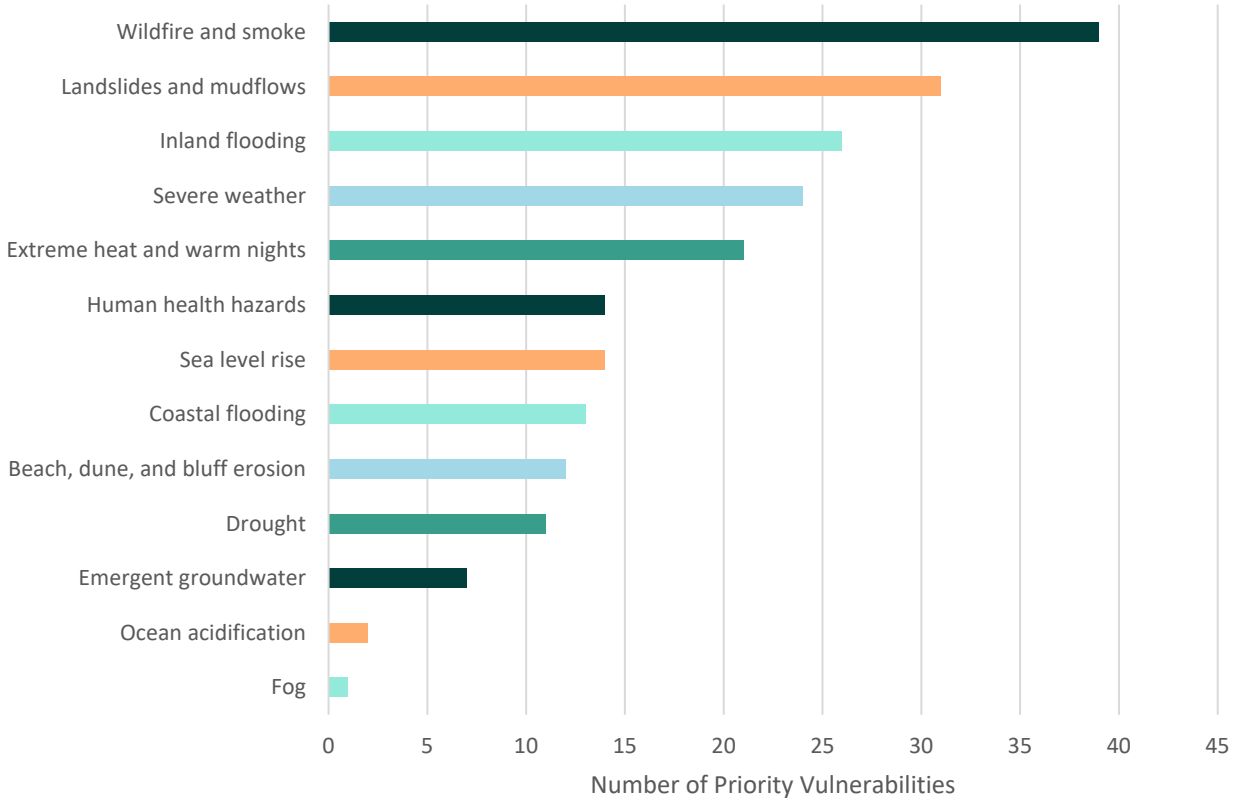
The CAAP includes a Vulnerability Assessment to evaluate how climate change may impact Laguna Beach. It identifies 13 key hazards and assesses the vulnerability of population groups, community identity, and assets to determine priority risks. Figure ES-3 illustrates the number of priority vulnerabilities for each hazard. The assessment's findings shaped the CAAP's adaptation strategies, which aim to strengthen the community's resilience.

Certain populations in Laguna Beach face greater challenges in responding to climate-related hazards. Senior citizens (65+), who make up about a quarter of residents, often struggle with emergency planning, evacuations, and home modifications to withstand hazards. Many have underlying medical conditions or rely on medications that increase their vulnerability, similar to individuals with limited mobility, chronic illnesses, or disabilities. These groups may have difficulty receiving emergency alerts, accessing resources, or making structural improvements to their homes. They are also more vulnerable to rolling power shutoffs, as many rely on electricity-dependent medical equipment.

Local artists, a cornerstone of Laguna Beach's arts culture, also face significant risks. Many lack a stable income, making it difficult to invest in home and studio improvements for hazard resilience. Financial strain, medical costs, and the loss of exhibition spaces due to disasters further threaten their livelihoods. Climate events can also disrupt tourism, reducing artists' income and exposure.

Additional priority vulnerabilities include children under 10, low-resourced households, outdoor workers, people experiencing homelessness, residents on single-access roads, people of color, linguistically isolated individuals, and those without access to essential services. Key community assets at risk include beaches and bluffs, arts and culture, infrastructure (energy, water, wastewater, stormwater, transportation, and communication), medical and care facilities, homes, hotels, retail and commercial buildings, hazardous materials sites, and community greenbelts and outdoor spaces. Addressing these vulnerabilities is critical for strengthening the city's resilience.

Figure ES-3: Hazards by Number of Priority Vulnerabilities



What Are the Community's GHG Emissions Reduction Targets to Help Mitigate the Impacts of Climate Change?

Setting clear emissions reduction targets is a critical step in mitigating climate change and achieving long-term sustainability goals. Targets establish measurable benchmarks for reducing GHG emissions over time. To reduce emissions across all sectors, the 2045 CAAP establishes three GHG emissions reduction targets:

- Target: By 2030, reduce GHG emissions to 40 percent below estimated 1990 levels.
- Target: By 2045, reduce GHG emissions to 85 percent below estimated 1990 levels.
- Target: By 2045, achieve carbon neutrality (Laguna Beach City Council Resolution No. 22.072, August 16, 2022).

Community Actions to Reduce GHG Emissions and Adapt to Climate Change

To meet GHG reduction targets and resiliency goals, the CAAP outlines 22 strategies to enhance Laguna Beach's adaptive capacity and lower emissions from community activities and City operations. These include 6 adaptation strategies and 16 mitigation strategies focused on directly reducing emissions.

Six priority strategies offer the greatest impact on emission reduction and community resilience:

- Enhance community resilience to wildfire risks through proactive mitigation and community preparedness.
- Facilitate the private-sector adoption of zero-emission vehicles.
- Increase residential energy efficiency in new and existing homes.
- Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.
- Accelerate the transition to renewable, resilient, and efficient power sources across governments.
- Accelerate the public-sector transition to zero-emission vehicles.

Achieving Laguna Beach's Climate Action Goals

Implementing all 22 strategies will strengthen Laguna Beach's adaptive capacity and reduce GHG emissions. Successful emission reductions and community resilience depend on effective CAAP implementation. City staff will integrate the plan's climate action and adaptation strategies into local policies, including the General Plan, municipal code, area and specific plans, Capital Improvement Program, and City budget, to prioritize action and maximize both GHG reductions and community resilience. Details on all the strategies can be found in **Chapter 3, Emission Reduction and Adaptation Strategy**. City staff will collaborate with residents to implement these strategies as soon as possible.

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CHAPTER 1

Introduction

INTRODUCTION

Laguna Beach is a community known for scenic natural landscapes and vibrant arts community. A changing climate threatens the beauty, safety, lifestyle, and economy of this artists' enclave. The City has a legacy of planning to protect the natural and built environment, and this Climate Action and Adaptation Plan builds on previous efforts to reduce harmful emissions and improve resilience to natural hazards.

Purpose of the Climate Action and Adaptation Plan

The Laguna Beach Climate Action and Adaptation Plan (CAAP) is a plan to help protect the environment and make Laguna Beach safer from climate-related problems. It focuses on cutting down harmful greenhouse gas (GHG) emissions and preparing the city to handle challenges like wildfires, floods, and other natural hazards. The City created this plan by listening to the community's ideas and combining them with expert research. The goal is to protect Laguna Beach's special environment, support its economy, and keep the community's way of life intact.

People in Laguna Beach have cared about climate issues for a long time. They know that the area's beauty and high quality of life depend on a healthy environment. But human activities that cause climate change have damaged the natural systems that Laguna Beach relies on, leading to more severe disasters like wildfires and rising sea levels. The CAAP is a way for the City to fight climate change and protect its people from future problems. This CAAP does several things:

- **Finds the Problem:** It figures out where GHG emissions come from in the community and identifies people and places that are most at risk from climate-related dangers.
- **Sets Goals:** The plan sets targets to reduce GHG emissions by the years 2030 and 2045.

Laguna Beach at a glance

- 22, 332 residents
- 6 million annual visitors
- 8.84 square miles of land
- 7 miles of coastline
- Key economic sectors:
  - Tourism
  - Arts and Culture
  - Hospitality

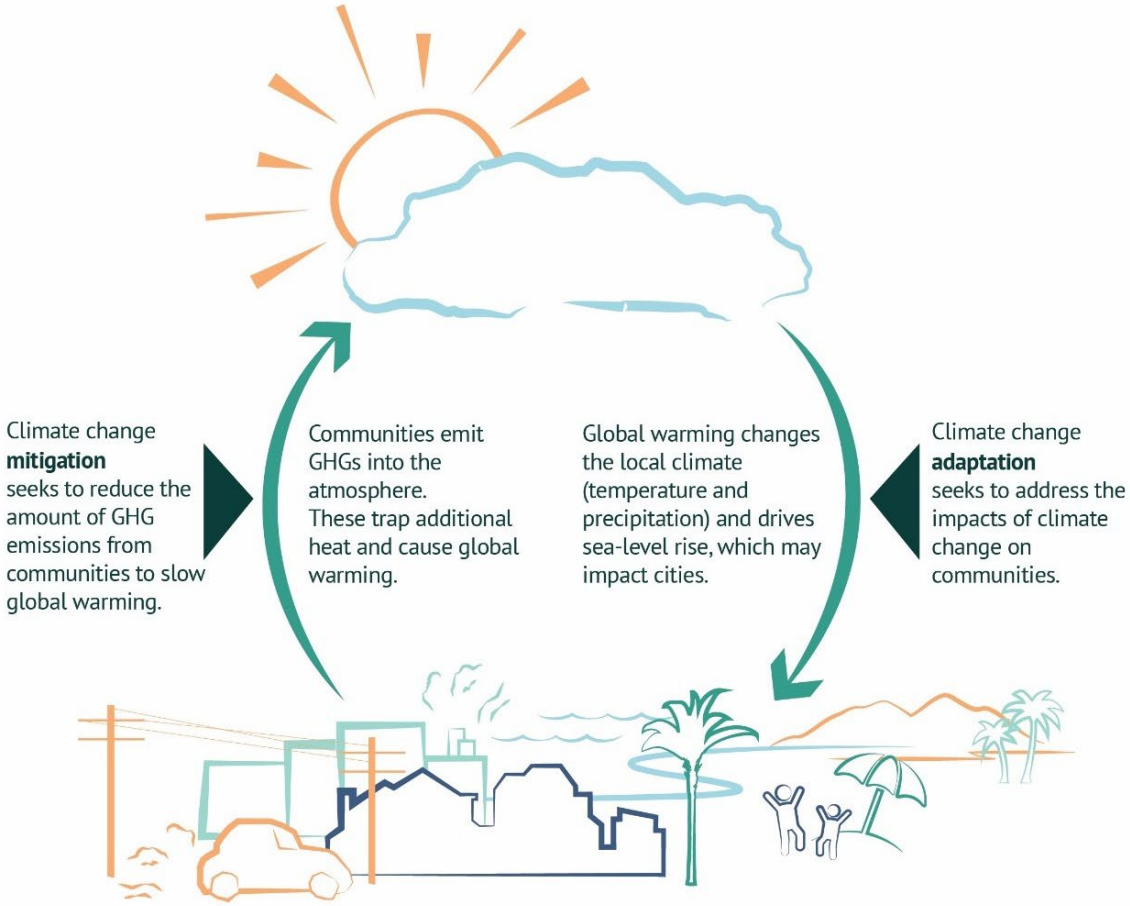
- **Identifies Actions:** It lists specific steps for the City, the community, and partner groups to take to lower emissions and reduce climate-related risks.
- **Educates the Community:** It teaches residents how they can help fight climate change and make Laguna Beach stronger against hazards in their daily lives.
- **Seeks Funding:** It helps the City find money to put these strategies into action and make the community more sustainable and safer.
- **Provides Extra Benefits:** The plan also helps by reducing air pollution, supporting local jobs, improving health, and making life better for everyone.
- **Aligns with State Goals:** It works alongside California's statewide efforts to cut GHG emissions and reach carbon-reduction targets.

In short, the CAAP is Laguna Beach's way of protecting its environment, economy, and residents while preparing for a future with climate change.

A Dual-Purpose Plan: Climate Change Mitigation and Adaptation

The CAAP includes strategies for both GHG emission mitigation and climate change adaptation because they address different but interconnected aspects of the climate crisis. Mitigation focuses on reducing the GHG emissions that drive climate change, helping to slow future impacts, while adaptation prepares communities for the inevitable effects already occurring, such as extreme weather events and rising sea levels. By integrating both approaches, the plan provides a comprehensive approach that builds resilience to current challenges while working toward long-term sustainability. **Figure 1** depicts the relationship between climate change mitigation and adaptation.

Figure 1: Climate Change Mitigation and Adaptation Relationship



The CAAP includes specific goals for climate mitigation and adaptation, which align with the State's goals and plans. With implementation of this CAAP, the City aims to:

- Reduce GHG emissions 40 percent below 1990 levels by 2030.
- Reduce GHG emissions 85 percent below 1990 levels and achieve carbon neutrality by 2045.
- Improve disaster resilience throughout the community.
- Safeguard the natural and built environment in Laguna Beach.

Climate Action in Laguna Beach

Laguna Beach has a history of sustainability, and the City has implemented several measures to reduce GHG emissions and improve resiliency prior to this current planning effort. The CAAP will build on these successful efforts, expanding the scope of these initiatives to increase their effectiveness and ensure their continued relevance.

Wildfire Mitigation Planning (1991–Present)

The City first began preparing for wildfire in the early 1990s with the Fuel Break Program (1991), which established an extensive fuel break, encompassing over 360 acres around the city and in canyons. The Weed Abatement Program was created in 2009 to reduce the threat of fire starting on weedy properties in the developed portion of the city, and to reduce the ability of fire to spread rapidly through weedy vegetation. The program is still managed by the Fire Department today. The 2017 Orange County Community Wildfire Protection Plan (CWPP), one of the first comprehensive wildfire planning efforts, addresses wildfire mitigation, including vegetation management, ignition prevention, community education and outreach, and firefighting initiatives in the State Responsibility Area. Over 90 percent of Laguna Beach is in the CWPP boundary, including Laguna Coast Wilderness Park, Crystal Cove State Park, and Aliso and Wood Canyons Wilderness Park, which are rated Very High Fire Hazard Severity. In 2018, the City completed the Wildfire Mitigation and Fire Safety Report, which includes an analysis of wildfire risk in Laguna Beach and a comprehensive list of actions to mitigate the risk and impacts of wildfire in the city should one occur. These actions fall into several primary categories: (1) emergency alert systems, (2) evacuation plans and improvements, (3) fuel modification zones, (4) public infrastructure improvements, and (5) undergrounding utilities. In 2019, the City Council adopted Ordinance Nos. 1640 and 1641, which amended the Fire Code and Building Code provisions of the Municipal Code to establish fuel modification guidelines for development projects that are within the Fuel Modification Zone (as designated by the City). The primary goal of these fuel

What Is Carbon Neutrality?

Carbon neutrality refers to achieving a balance between the amount of GHGs emitted into the atmosphere and the amount removed or sequestered. This is typically done by reducing emissions from sources like energy production, transportation, and buildings, while also investing in projects to sequester carbon. Sequestration involves capturing and storing carbon dioxide in plants, soil, or geological formations, effectively reducing the net amount of carbon in the atmosphere. The goal is to reach net-zero emissions, meaning the total emissions produced are equal to the amount taken out of the atmosphere, effectively neutralizing their impact on climate change.

Fire Safe Councils

There is one Fire Safe Council operating in the Laguna Beach region: the Greater Laguna Coast Fire Safe Council (serving the greater Laguna Beach area). This community-led organization helps protect the local region from wildfire disasters through resident education and the promotion of fire mitigation measures to government officials.

Firewise Communities

Firewise Communities are part of a national recognition program administered by the National Fire Protection Association. Firewise Communities are citizen-led programs meant to raise awareness, organize at the community level, coordinate work parties, and take action to create fire-adapted communities through the implementation of defensible space standards and home hardening strategies. Laguna Beach is not currently a recognized Firewise Community. The neighboring community of Emerald Bay is a Firewise Community through the Emerald Bay Community Association. However, their wildfire efforts do not extend to Laguna Beach.

modification guidelines is to slow the spread of wildfires by treating wildland habitats near neighborhoods. This practice helps provide time for residents to evacuate and for fire personnel to respond during wildfires.

In conjunction with vegetation management to reduce the risk of a wildfire starting or spreading, the City has engaged in evacuation route, or egress, analysis and planning in case a wildfire does start to ensure safe evacuation of residents and visitors. Laguna Beach faces substantial evacuation constraints because the Pacific Coast Highway and Laguna Canyon Road leading to State Route 73 are the only options to leave the community, any of which may be blocked during a wildfire or other emergency.

In 2021, the City prepared a Wildfire Egress Study to analyze how long it might take to evacuate the community during a wildfire event. Overall, the study notes that under normal roadway conditions, it could take over four hours to evacuate all of Laguna Beach, although this can increase significantly if primary evacuation routes are blocked. The study found that Canyon Acres Drive, Bluebird Canyon, and the Diamond Street/Crestview Drive neighborhoods were particularly evacuation constrained. In response to this, the City began the Bluebird Canyon Drive Evacuation Route Widening Project (2023) to widen Bluebird Canyon Drive and underground 20 utility poles to improve evacuation operations and reduce risk of fire in Laguna Canyon. In 2021, the City also adopted a defensible space ordinance, which improves wildfire resilience by requiring all existing habitable buildings and structures in the Very High Fire Hazard Severity Zone to maintain defensible space in the form of managed vegetation to prevent ignition from wildfires.

Climate Protection Action Plan (2009)

The Climate Protection Action Plan (CPAP) is Laguna Beach's first comprehensive strategy to reduce GHG emissions community-wide. The City's Environmental Sustainability Committee (formerly the Environmental Committee) produced the CPAP and provided recommendations on a broad array of measures to reduce emissions and create a more environmentally conscious community. CPAP recommendations focused on transportation and activities that use electricity, which at the time made up nearly 75 percent of Laguna Beach's community-wide GHG emissions. Key initiatives include promoting energy-efficient building practices, encouraging public transportation and alternative modes of transportation to internal combustion engine vehicles, and increasing the use of renewable energy. It sets specific goals for reducing emissions and enhancing overall sustainability, aiming to create a more resilient and environmentally conscious community. The plan also emphasizes community engagement and education to raise awareness about climate change issues and foster a sense of responsibility among residents and businesses in Laguna Beach. As of 2017, Laguna Beach had implemented 92 of the 94 actions in the CPAP. The CAAP builds on the successful efforts of the adopted CPAP, expanding the scope of its initiatives to increase their effectiveness and ensure their continued relevance.

Enhanced Mobility and Complete Streets Transition Plan (2015)

The Enhanced Mobility and Complete Streets Transition Plan provides an assessment of the existing transportation environment and identifies opportunities for enhanced mobility and complete streets. The recommendations are intended to improve the effectiveness of Laguna Beach's street and sidewalk system for biking, walking, and transit, which can motivate residents and visitors to choose more sustainable modes of transportation than car use and therefore reduce transportation-related emissions. The recommendations from the Enhanced Mobility and Complete Streets Transition Plan informed the relevant CAAP strategies aimed at reducing reliance on single-occupancy vehicles as the main way to get around Laguna Beach.

Laguna Beach General Plan

A community's General Plan is often considered the blueprint for future development. Many cities incorporate climate action and adaptation goals and policies into their General Plan. Laguna Beach codified their GHG emission reduction goals in the Land Use Element of the General Plan in 2011 with a goal to "create a community that is sustainable, resilient, and regenerative" and a supporting policy to reduce GHG emissions 80 percent below 1990 levels by 2050. It is important that subsequent planning efforts support the goals of the General Plan. Through specific, actionable strategies, this CAAP seeks to realize the goals of the General Plan and provide a roadmap for the City and community members to achieve meaningful GHG emission reductions.

General Plan Safety Element Update (2021)

Laguna Beach updated its General Plan Safety Element in 2021. The Safety Element contains policies that address hazards from fire and flood, shoreline protection, climate adaptation and resilience, and disaster and emergency preparedness, including evacuation. Key Safety Element goals include promoting a culture of preparedness among all Laguna Beach community members through comprehensive emergency management practices, reducing the threat of wildfire hazards, reducing flood impacts, adapting to changing flood conditions, and ensuring that Laguna Beach is ready to address the impacts of climate change. The Safety Element is a required element of the General Plan and must be reviewed and updated every eight years, concurrent with the update of the City's Housing Element. The next update of the Safety Element will be an opportunity to further integrate the CAAP, Safety Element, and other complementary City plans. While the CAAP and Safety Element analysis and strategies overlap, the CAAP specifically focuses on hazards related to climate change and has a long-term vision for adaptation.

Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan (2022)

The Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan is a study and plan to convert 147 City-owned vehicles to electric power by 2032. The Plan includes the results of an analysis of the necessary number of EV chargers to support the transition to EVs mandated by the State's Advanced Clean Fleets regulations and modeled in the 2022 California Scoping Plan update. This includes vehicles for the City's internal operations as well as the Laguna Beach Trolley vehicles. Converting City vehicles to EVs reduces GHG emissions from municipal operations and symbolizes the City's commitment to sustainability. Increasing the number of publicly available EV chargers in Laguna Beach helps remove barriers to EV ownership for community members as they can charge vehicles away from their homes and reduces GHG emissions from transportation. The Fleet Electrification and EV Charging Infrastructure Master Plan informed the actions related to transitioning City-owned vehicles to electric models.

Local Hazard Mitigation Plan (2023 update)

The Local Hazard Mitigation Plan (LHMP) is a plan to make the community more resilient to disasters, reduce the risk of damage in the case of an emergency, and reduce the time and resources to recover. The LHMP provides a comprehensive assessment of the threats that the city faces from natural and human-caused hazards and a coordinated strategy to reduce these threats. The LHMP also contains a comprehensive set of mitigation actions to support community preparedness and reduce the harm from coastal hazards, pests and diseases, extreme weather, flooding, landslides and mudflows, and wildfires. The LHMP's focus is to provide public safety officials, city staff, elected officials, and members of the public with an understanding of the threats from natural and human-caused hazards in our community. The LHMP is a short-term document containing specific recommended actions to proactively decrease these threats before disasters occur. The CAAP simultaneously addresses climate change-related natural hazards and the community's climate resilience so that it is in line with the LHMP.

The Inflation Reduction Act

The Inflation Reduction Act (IRA), passed in 2022, is one of the most significant pieces of federal legislation aimed at addressing climate change. It invests billions of dollars in clean energy, energy efficiency, and other technologies that reduce GHG emissions, accelerating the nation's transition to a low-carbon economy. The IRA supports cities in their climate change mitigation and adaptation efforts by providing funding and tax incentives for renewable energy projects, electric vehicles, and energy-efficient infrastructure. The law also established grants to help communities plan for and adapt to the impacts of climate change, making it easier for cities to implement comprehensive climate action and adaptation plans.

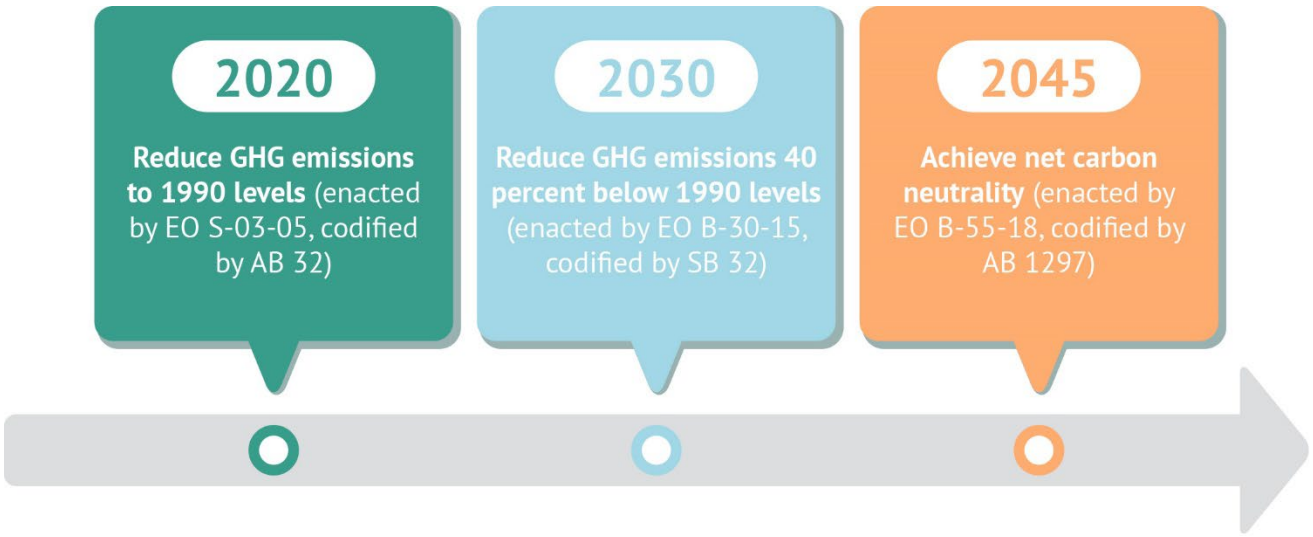
Microgrid Resiliency Plan (2024)

As part of the CAAP, the City commissioned a Microgrid Resiliency Plan that will lead directly to the implementation of microgrids. Microgrids are localized and self-contained electrical systems that can generate, store, and distribute electricity independently or in conjunction with the main power grid. This often incorporates renewable energy sources like solar panels and energy storage systems, enhancing energy resilience and reliability. The plan identifies four priority sites—the City Hall Campus, Corporation Yard, Community and Recreation Center, and Susi Q Center facilities—as high potential opportunities for solar photovoltaic and battery energy storage system microgrids based on their statuses as current or future emergency operations centers, critical facilities, and potential capacity.

State and Regional Climate Action

Laguna Beach is not alone in planning for climate change and is part of a larger regional and statewide effort to ensure a healthy, safe, and prosperous California for generations to come. California has a history of enacting legislation aimed at reducing the State's GHG emissions and ensuring resiliency in the face of a changing climate. California law first addressed climate change directly in 1988, when Assembly Bill (AB) 4420 directed the State to prepare a GHG inventory and study the impacts of climate change. Since then, California's governors have signed several executive orders, and the legislature has adopted several laws to assess climate change, analyze GHG emissions and their effects, reduce emissions, and prepare for the impacts of climate change. Many of these laws and regulations affect local governments, but not all create specific requirements for individual communities. This section provides brief summaries of key state and regional climate change legislation and programs. **Figure 2** lists the GHG reduction goals for the State of California. **Appendix A** provides more detail on many of these efforts.

Figure 2: California's GHG Emission Reduction Goals



State Climate Action and Regulation

California Assembly Bill 32 (2006)

California's AB 32, the Global Warming Solutions Act of 2006, mandates that the state reduce its GHG emissions to 1990 levels by 2020. This landmark legislation primarily targets state-level action but also sets expectations for local governments. Local governments are encouraged to develop and implement their own climate action plans to align with the statewide targets. Additionally, local governments are tasked with measuring and reporting GHG emissions to contribute to the statewide tracking of progress. This involvement supports California's long-term goals, which include more aggressive reductions outlined in subsequent legislation like Senate Bill (SB) 32.

California Senate Bill 32 (2016)

SB 32 expands on the earlier AB 32 by requiring the state to reduce its GHG emissions to 40 percent below 1990 levels by 2030. For local governments, this law has significant implications as they are expected to align their climate action plans, land use decisions, and transportation strategies with this ambitious target.

California Assembly Bill 1279 (2022)

AB 1279, also known as the California Climate Crisis Act, established a carbon neutrality target, or net-zero GHG emissions, along with a target to reduce GHG emissions 85 percent below 1990 levels by 2045. The bill also directs the California Air Resources Board to work with other relevant State agencies to achieve these targets.

Climate Change Scoping Plan

The California Air Resources Board first developed the State's Climate Change Scoping Plan in 2008 to outline strategies for reducing GHG emissions to meet adopted state climate targets. The Scoping Plan identifies local governments as strategic partners and focuses on sustainable land use, zero-emission transportation, energy efficiency, and waste management. It incorporates a variety of mechanisms, including regulations, incentives, and market-based approaches, such as California's cap-and-trade program. The 2022 Scoping Plan focuses on achieving carbon neutrality through emissions reductions and carbon capture technologies.

California Coastal Commission Sea Level Rise Policy Guidance

The California Coastal Commission Sea Level Rise Policy Guidance provides an overview of the best available science on sea level rise for California and recommended methodology for addressing sea level rise in Coastal Commission planning and regulatory actions. It is intended to serve as a comprehensive, multipurpose resource for a variety of audiences, including local governments in the California Coastal Zone. The Coastal Commission adopted the most recent update of the Sea Level Rise Policy Guidance on November 14, 2024, to replace the 2018 version.

Preliminary Orange County Climate Action Plan

The Preliminary Climate Action Plan (PCAP) for Orange County focuses on both reducing GHG emissions and enhancing resilience to climate impacts. The plan includes a comprehensive GHG inventory for unincorporated Orange County and County operations and establishes reduction targets to address these emissions. The plan also has strategies to safeguard vulnerable populations and natural resources against hazards. Key sectors for action include energy, transportation, and waste management. The planning process is underway, and the County anticipates completing the plan in 2025. Although the PCAP does not address GHG emissions in Laguna Beach, many of the emission reduction strategies are similar to those in this CAAP. The City can work closely with the County to share resources and experience to implement these strategies in a uniform and wide-reaching way.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires many proposed development projects to conduct an environmental review that identifies how the project may impact the environment, including changes to GHG emissions. The State CEQA Guidelines include provisions for local governments to use adopted plans for reducing GHG emissions to address

the cumulative impacts of individual future projects on GHG emissions (see State CEQA Guidelines Section 15183.5(b)(1)).

Consistent with the State CEQA Guidelines, lead agencies may use adopted GHG emissions reduction plans, such as a CAAP, to assess the cumulative impacts of projects on climate change at a programmatic level. If the adopted plan is consistent with State CEQA Guidelines Section 15183.5, the analysis and GHG emissions reduction efforts in the plan may be applied to individual projects, meaning that the projects would not have to conduct separate GHG analyses and project-specific environmental documents may tier from and/or incorporate by reference the existing programmatic review. A project-specific environmental review that relies on this CAAP for its cumulative impact analysis must show consistency with the plan by preparing a Consistency Checklist, identify specific GHG emissions reduction strategies from the CAAP that are applicable to the project, and demonstrate how the project will implement these strategies. Project applicants and City staff will identify which specific strategies are applicable to each project during project review. If applicable strategies are not otherwise binding and enforceable, they must be incorporated as mitigation strategies for the project. Projects that have cumulative impacts on GHG emissions may still need to prepare a separate GHG analysis and environmental review.

This CAAP meets the requirements in the State CEQA Guidelines that allow it to be applied to individual projects by:

- Quantifying emissions, both existing and projected over a specified period, resulting from activities within a defined geographic area, as discussed later in **Chapter 2**.
- Establishing a level, based on substantial evidence, below which the contribution of emissions from activities covered by the plan would not be cumulatively considerable. **Chapter 2** of this CAAP identifies the City's GHG emission reduction goals, consistent with the State's regulatory goals, which are:
  - Reduce emissions to 40 percent below 1990 levels by 2030.
  - Reduce emissions to 85 percent below 1990 levels by 2045.
  - Support statewide net carbon neutrality by 2045.
- Identifying and analyzing the emissions resulting from specific actions or categories of actions anticipated in the area, as discussed in **Chapter 3**.
- Specifying strategies or a group of strategies, including performance standards that, if implemented on a project-by-project basis, substantial evidence demonstrates they would collectively achieve the specified emissions level, as discussed in **Chapter 4**.

- Establishing a mechanism to monitor the plan's progress toward achieving specific levels and to require amendment if the plan is not achieving those levels, as discussed in **Chapter 4**.
- Including an environmental review of the CAAP. The City determined this CAAP is exempt from environmental review pursuant to CEQA Guidelines Sections 15307 and 15308.

Plan Preparation

The project team prepared the CAAP in partnership with community groups, committees, and residents. Feedback from these stakeholders informed the initial technical analysis to understand existing GHG emission sources and vulnerabilities to hazards as well as the final strategies to improve sustainability in Laguna Beach. In the initial phases of the planning process, the City hosted a community open house to orient residents to the CAAP project and provided an opportunity for feedback on the key issues related to climate change mitigation and adaptation in Laguna Beach. The City also held small group discussions with local service providers and advocacy groups, including utility providers, arts organizations, and environmental advocacy groups. The City established a CAAP Working Group to advise on the project. The Working Group is made up of members from the City Council-appointed Emergency and Disaster Preparedness Committee and the Environmental Sustainability Committee. The Working Group serves as the lead advisor to City staff, from a citizen perspective, on the development of the CAAP, and serves as a liaison to their respective committees on the progress of the CAAP.

How to Use This Plan

The effects of climate change are already apparent in Laguna Beach and will intensify without focused, equitable action to reduce GHG emissions and adapt to future conditions. The CAAP is intended for residents, workers, business owners, City staff, and policymakers to provide information about the science of climate change, to highlight what the City has already done to address climate change, and to establish a road map for additional GHG emissions reductions and advances in community resilience.

The City will use this document to help set climate action and adaptation planning priorities, allocate resources to the communities and assets that are most vulnerable to hazards, and monitor and evaluate progress towards GHG emissions reduction goals and increases in community resilience. Residents, workers, and business owners can use this document to better understand their personal and community-level vulnerability to climate change and for guidance on how to reduce their GHG emissions and improve their climate resiliency. This CAAP guides new development by enacting strategies that will reduce GHG emissions associated with the built environment and bolster resilience of local facilities and infrastructure. It also informs conservation planning by establishing strategies to protect natural resources, including in partnership with local and regional landowners. The CAAP is a qualified Climate Action Strategy, which means that future development projects requiring environmental review under State law can streamline their GHG impact analyses by demonstrating consistency with the CAAP. This streamlining can save time and money during the environmental review process by allowing developers to reduce the number of steps involved in the environmental impact assessment process. Therefore, it is important that developers, landowners, planners, and others familiarize themselves with the strategies in the CAAP and comply with these strategies when constructing new development.

The remainder of this CAAP covers the following topics:

- **Chapter 2** (Climate Change in Laguna Beach) discusses the science of climate change and the impacts on Laguna Beach. It presents the results of two GHG emissions analyses: an inventory of existing community-wide and City government operations emissions (calendar years 2018 and 2021) and a forecast of future emissions under "business as usual" conditions. It also presents the results of a Vulnerability Assessment, which analyzes the specific risks of climate change-related hazards in Laguna Beach and how these hazards are expected to change. It identifies the populations, infrastructure, and other community assets that are most vulnerable to these hazards.

- **Chapter 3** (Emission Reduction and Adaptation Strategy) identifies the levels of GHG emissions reductions that the CAAP seeks to achieve and presents a set of strategies to meet or exceed these reductions. It also shows the GHG emissions that have already been reduced through existing and planned State, regional, and local efforts. This chapter also presents a set of adaptation strategies to bolster Laguna Beach's resilience to future hazards.
- **Chapter 4** (Realizing the CAAP) introduces how to implement the CAAP and how to monitor progress. It will discuss the different components of implementing the plan, including timeframes, responsible groups or agencies, applicability, costs, and potential funding sources as appropriate.
- **Appendix A** (State and Regional Climate Change Mitigation and Adaptation Plans and Programs)
- **Appendix B** (Greenhouse Gas Inventories and Forecast Appendix)
- **Appendix C** (Quantification Technical Appendix and Key Assumptions)

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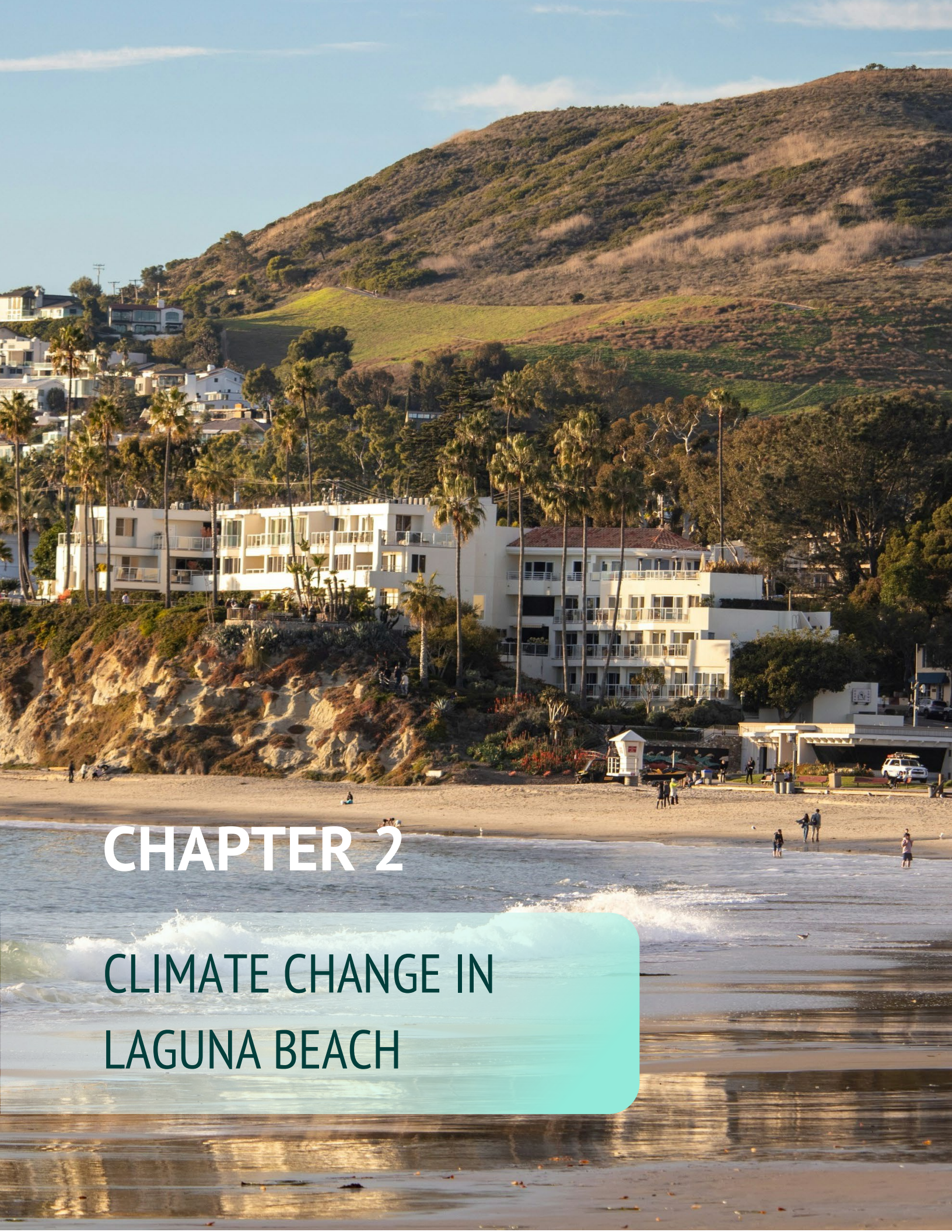


CHAPTER 2

CLIMATE CHANGE IN LAGUNA BEACH

CLIMATE CHANGE IN LAGUNA BEACH

Climate change is exacerbated by human activities and impacts global weather systems, which poses risks to local communities. Laguna Beach is vulnerable to several natural hazards that are expected to become more frequent and extreme with a warming climate. Cities also contribute to rising GHG emissions through their daily activities and operations. To inform the strategies in the CAAP, the plan includes a current GHG emissions inventory for Laguna Beach and forecasts GHG emission levels to 2030 and 2045 to determine the level of emissions if the community were to take no action. It also includes an assessment of the people, structures, and natural features in Laguna Beach that are vulnerable to climate hazards.

Climate Science: What Is Climate Change?

Climate change refers to long-term shifts in temperature, weather patterns, and environmental conditions. It is normal for Earth's climate system to experience long-term shifts, but human activity, mainly in the form of burning fossil fuels such as coal and oil, along with deforestation and other industrial activities, is causing the global climate to change at a much more rapid pace than in the past. This includes everyday activities like driving a gasoline-powered car, using natural gas-powered appliances, or throwing food waste in a landfill. These activities release GHGs such as carbon dioxide, methane, and nitrous oxide into the atmosphere where they trap heat and lead to a warming of the earth's surface and climate—hence the term "the greenhouse effect." A warming climate disrupts global weather patterns by intensifying the frequency and severity of extreme weather events. As temperatures rise, the atmosphere holds more moisture, leading to heavier rainfall and increased flooding in some regions, while other areas experience prolonged droughts and heatwaves. Warmer oceans also fuel stronger storms that cause greater damage to coastal shorelines and bluffs. These shifts in weather patterns destabilize ecosystems, agriculture, and infrastructure, creating widespread challenges across the world.

Climate Change in California

In California and western North America, observations of the climate have shown:

- A trend toward warmer temperatures with an increase in extremely hot days and nights.
- An increase in the area burned by wildfires.
- A smaller fraction of precipitation falling as snow.
- An increase in frequency of drought and an increase in consecutive dry years.
- Rising sea levels that increase flooding and erosion on beaches, bluffs, and cliffs.[31]

These changes in climate will affect economic systems throughout California, including Laguna Beach. The California Fourth Climate Change Assessment, which is produced by the Governor's Office of Land Use and Climate Innovation, estimates that taking no action to address the potential impacts of climate change will lead to economic losses of "tens of billions of dollars per year in direct costs" and "expose trillions of dollars of assets to collateral risk." **Table 1** summarizes potential impacts in California from climate change.

Table 1: Climate Change Impacts in California

Climate Impact	Historical Trends	Future Direction of Change	Confidence for Future Change
Temperature	Warming	Warming	Very High
Sea Level Rise	Rising	Rising	Very High
Snowpack	Declining	Declining	Very High
Acres Burned by Wildfire	Increasing	Increasing	Medium-High
Intensity of Heavy Precipitation Events	No significant trends	Increasing	Medium-High
Frequency of Droughts	No significant trends	Increasing	Medium-High
Marine Layer Clouds	Some downward trends	Unknown	Low
Annual Precipitation	No significant trends	Unknown	Low

Source: Louise Bedsworth et al., 2018, "Statewide Summary Report," in *California's Fourth Climate Change Assessment*, publication no. SUMCCCA4-2018-013.

Climate Change in Laguna Beach

The effects of climate change are not just environmental, as they impact public safety, health, and quality of life. Heatwaves, for example, can lead to heat-related illnesses, while worsening air quality exacerbates respiratory conditions. Flooding and wildfires pose direct threats to lives and property, forcing costly repairs, loss of property insurance, and displacement of

residents. For Laguna Beach to adapt and thrive in the face of these challenges, a proactive approach like the CAAP is essential. Communities like Laguna Beach, which depend on their natural beauty and coastal location for a high quality of life and strong local economy, are especially vulnerable to the impacts of climate change. Rising sea levels and eroding bluffs can damage homes, businesses, and vital transportation infrastructure, while increased wildfire risk threatens hillside neighborhoods and harms air quality in the region. Additionally, the tourism industry, which plays a critical role in Laguna Beach's economy and attracts an estimated 6 million visitors to the community each year, is at risk as extreme weather events and environmental degradation make the area less attractive to visitors and endangers the wildlife and biodiversity that are essential to the area's character and natural balance.

Greenhouse Gas Inventory and Forecast

The first step in preparation of a CAAP is to assess current GHG emissions in the community through what is called a GHG emissions inventory, and to forecast those emissions to future years based on current population growth assumptions. A GHG inventory is an accounting of the GHG emissions attributable to a particular community over the course of a specific year. For this CAAP, the project team inventoried GHG emissions for 2018 and 2021. For local governments, a GHG inventory is essential for identifying the main sources of emissions in their jurisdiction and establishing a baseline to track progress towards emissions reduction goals. A GHG inventory also helps to inform the CAAP policies, as it is critical for policies to address the largest sources of GHG emissions in the community.

GHG emissions are generated by commonplace daily activities. Some GHG emissions are released at the location of the activity, such as carbon dioxide emissions from a vehicle's internal combustion engine. Alternatively, other activities, such as using fossil-fuel derived electricity in a building, cause GHG emissions to be released elsewhere, at the location of the power plant. Therefore, for this CAAP, the City considered GHG emissions attributable to community activities and government operations, including GHG emissions generated at facilities or locations outside Laguna Beach's jurisdictional boundary. The inventories included in the CAAP estimate emission levels of three of the most common GHGs from human activities: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs are not emitted in Laguna Beach or are only emitted in trace amounts and cannot be accurately assessed. In preparation of this CAAP, the project team updated an existing GHG emissions inventory for 2018, originally prepared by the City in 2021.[32]

The revised 2018 inventory uses the most recent methodological guidance and protocol. The project team also completed a new GHG emissions inventory for 2021. This section summarizes the results of the GHG inventories and forecast for Laguna Beach. **Appendix B** provides greater detail on these results.

The CAAP contains two types of GHG emissions inventories: (1) a community-wide inventory; and (2) a government or government operations inventory.

- A **community-wide inventory** identifies GHG emissions that result from activities of Laguna Beach residents, businesses, visitors, and other community members. Examples include residents driving cars, homes using water, and businesses using electricity.
- A **government operations inventory** summarizes emissions that are a direct result of the City's municipal government operations. Examples include electricity and water used in municipal buildings or the fuel used for City vehicles. While government operations' GHG emissions are included in a broader community-wide inventory, completing a government operations GHG emissions inventory is beneficial because it allows local governments to specifically track and manage the emissions directly under their control.

Methods

Guidance documents, called protocols, provide recommendations on how to adequately assess GHG emissions. The CAAP team prepared the inventories in a manner consistent with two widely adopted, standard protocol documents: the Local Government Operations Protocol, and the United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions. These protocols provide guidance by defining what activities should be included in the GHG emissions inventory, and how to consistently estimate emissions from those activities. The use of standard methods allows for comparison of GHG emissions across multiple years and communities.

The Local Government Operations Protocol (LGOP) was first developed by the California Air Resources Board in 2008 and updated in 2010. The LGOP is a tool for accounting and reporting GHG emissions of local government operations and is used throughout California and the United States. The LGOP includes guidance from several existing partner programs as well as the State's mandatory GHG reporting regulations. This protocol provided guidance for most of the estimates made in the government operations inventory.

Local Governments for Sustainability (ICLEI) first developed the United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol) – Local Governments for Sustainability USA in 2012 and updated it most recently in 2019. The Governor's Office of Land Use and Climate Innovation encourages cities and counties in

Units of Measurement: $MTCO_2e$

The GHG inventories and forecasts report emissions in carbon dioxide equivalents (CO_2e), which is a unit that allows combined reporting of all GHGs analyzed in the inventory: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). CO_2e is a weighted unit that reflects each GHG's relative potency. Non-carbon dioxide GHGs (methane and nitrous oxide) are converted to an equivalent quantity of carbon dioxide based on their global warming potential. The inventory reports the amounts of GHGs in metric tons of CO_2e ($MTCO_2e$). One metric ton is equal to 1,000 kilograms or approximately 2,205 pounds.

California to follow the U.S. Community Protocol for community-wide GHG emissions. It is also used in Laguna Beach's government operations inventory in limited cases where the LGOP lacks specific calculations for an emissions type, for example, wastewater emissions.

GHG emissions inventories and forecasts are estimates of GHG emissions rather than direct measurements of emissions. The use of the standard methods identified in the protocols, in combination with verified datasets from appropriate sources, makes GHG inventories accurate and consistent estimates of local emissions.

Emission Factors

In accordance with the protocols, most of the GHG emissions are calculated using data on GHG-generating activities in combination with emission factors. An emission factor describes how many $MTCO_2e$ are released per unit of an activity. For instance, an emissions factor for electricity describes the $MTCO_2e$ produced per kilowatt-hour (kWh) of electricity used, or an emission factor for transportation describes the $MTCO_2e$ produced per mile of driving. Emission factors may change from year to year based on changes in the technologies, fuels, or behaviors associated with the emissions. For example, an increase in vehicle fuel efficiency and greater adoption of zero-emission vehicles causes a decrease in emission factors for vehicles.

GHG Emissions from Wildfire

There are established methods of estimating GHG emissions from wildfire, which in some years can be significant.

- In the year 2020, which saw the most acres burned statewide in record history, the California Air Resources Board estimated that wildfires were the second-largest emitter of GHGs in California.[33]

- In Laguna Beach, there are no emissions from wildfires in the 2018 and 2021 inventories as there were no reported wildfires in Laguna Beach during the inventory years.

Sources of GHG Emissions in Laguna Beach

The 2018 and 2021 community-wide GHG emissions inventories assessed the following eight sectors:

Energy – Residential built environment:
Electricity and natural gas are used to power lights and appliances in residential buildings, which produces GHG emissions. The number of GHG emissions produced depends on the amount of energy used in buildings and the source of the energy (renewable versus fossil-fuel-based). This includes the losses in power between sources of power supply and residential users, known as transmission and distribution losses. Southern California Edison and San Diego Gas & Electric provide residential electricity in Laguna Beach. SoCal Gas provides natural gas.

Energy – Commercial/industrial built environment:
Electricity and natural gas are used to power lights and appliances in nonresidential buildings and operations (e.g., industrial, commercial, municipal). This includes the losses in power between sources of power supply and commercial/industrial users, known as transmission and distribution losses. Southern California Edison provides nonresidential electricity, and SoCal Gas provides natural gas to nonresidential customers.

Transportation:
Vehicles traveling on local roads and State highways produce GHG emissions from burning gasoline, diesel, or natural gas for fuel. The number and distance of trips within the city limits is informed by the Orange County Transportation Authority's regional travel demand model, as measured in vehicle miles traveled (VMT). Trips that merely pass through the city limits are not included. This sector includes emissions from light-duty vehicles (those weighing 8,500 pounds or less, which includes passenger cars and small trucks/vans/SUVs) and heavy-duty vehicles (those weighing more than 8,500 pounds, which include many commercial trucks and buses). This sector also includes emissions from public transit vehicles in Laguna Beach.

Solid waste generation:
Waste material produced by the community is deposited in landfills and decomposes to produce methane. It is mostly organic material, such as food waste, that produces methane in landfills. This sector also includes waste that is burned (waste-to-energy), which emits GHGs into the air as a byproduct of incineration. Solid waste tonnage comes from the City and waste characterization is informed by CalRecycle and the California Air Resources Board.

Water:
Electricity is required to treat and pump water that is used by residents and workers in Laguna Beach. This category measures the emissions from electricity based on the amount of water used in the community, how far it travels to reach Laguna Beach, and the methods of treatment to make it safe for drinking and use. Water data comes from the two water suppliers for Laguna Beach: Laguna Beach County Water District and South Coast Water District.

Wastewater:
Electricity is used for the equipment that treats and pumps wastewater created by residents and workers in Laguna Beach. The processes of treating wastewater also produce emissions directly due to the decomposition of the waste material and the methods of treatment. Data for this sector comes from the South Orange County Wastewater Authority.

Off-road equipment:
Portable equipment and vehicles that do not travel on roads (e.g., construction or lawn and garden equipment) produce GHG emissions from the fuel they use (gasoline, diesel, natural gas). Results from this sector were not included in the initial 2018 GHG inventory. They have been retroactively added using the same method as the 2021 inventory, which is informed by the EMFAC model from the California Air Resources Board.*

Land use and sequestration:
Carbon dioxide is absorbed and stored in trees and soils (sequestration) or released into the atmosphere from the development of previously undeveloped lands (land use) as trees and vegetation are cleared. This category measures the change in trees and vegetation due to development or urban greening efforts over a 20-year period. Results from this sector were not included in the initial 2018 GHG inventory. They have been retroactively added using the same method as the 2021 inventory. Data for this sector, which includes acres of developed land, comes from the City of Laguna Beach.

* The EMFAC (Emission Factors) model was developed by the California Air Resources Board (CARB) to estimate emissions from on-road vehicles and off-road equipment. https://ww2.arb.ca.gov/our-work/programs/msei/on-road-emfac.

Sources of GHG Emissions in Local Government Operations

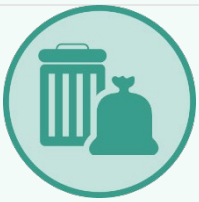
The 2018 and 2021 government operations GHG inventories assessed the following seven sectors:

Energy:
Buildings, facilities, streetlights, and traffic signals use electricity and/or natural gas, which produce GHG emissions. The amount of GHG emissions depends on the type, amount, and source of the energy that is used.

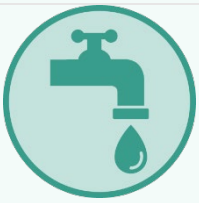
Employee commute:
When government employees commute to work, whether by personal vehicle, carpool, or transit, they produce GHG emissions. This sector measures the GHG emissions produced by local government employees that drive to work and is based on the type of car they drive, the type of fuel used, and the distance of their commute.

Transportation - Transit:
Laguna Beach's local trolleys run on propane, which produces GHG emissions. This sector also measures the fuel used to power transit operations beyond the trolleys.

Transportation - City fleet:
The City of Laguna Beach owns vehicles for various local government operations, such as police and public works maintenance. This category measures the GHG emissions from the fuel used by City-owned vehicles.



Solid waste:
This category includes GHG emissions from waste produced specifically by City of Laguna Beach employees and visitors to City facilities that is deposited into landfills.



Water:
This category includes GHG emissions from the energy used to treat and pump water used by City employees and visitors to City facilities.

Wastewater:
This category includes GHG emissions from the energy used to treat and pump wastewater created by City employees and visitors to City facilities, along with emissions from the processing of wastewater.

Community-Wide GHG Emissions

Table 2 and **Figure 3** show the community-wide GHG emissions for Laguna Beach during the inventory years. Total community-wide emissions increased 5 percent from 2018 to 2021.

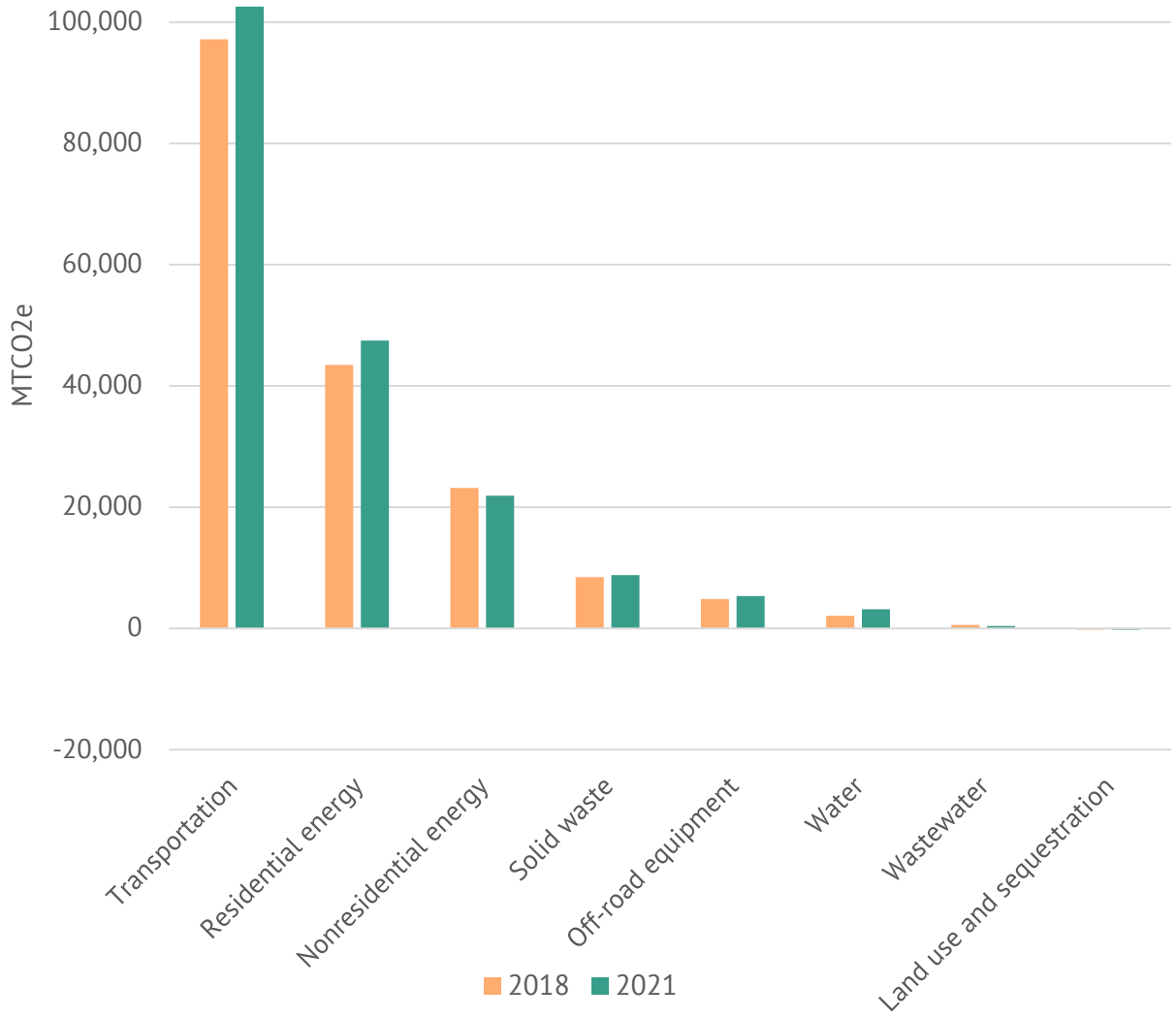
- **Transportation:** The transportation sector, which includes personal vehicles, commercial vehicles, regional buses, and local trolleys, remains the largest source of emissions in 2018 and 2021 at 54 percent of total emissions each year. Most of these emissions come from light-duty single-occupancy vehicles used by residents, workers, and visitors.
- **Energy Use:** Residential and nonresidential energy are the second- and third-largest sources of GHG emissions making up approximately 25 and 12 percent, respectively. These emissions are caused by electricity and natural gas use in buildings for lighting, appliances, and heating and cooling. In addition to the amount of energy used, the source of electricity also affects emissions from this sector, as power generated by nonrenewable sources (coal, natural gas, or other fossil-fuels) produces more GHG emissions than power from renewable sources like solar or wind.

Table 2: Community-wide GHG Emissions for Laguna Beach in 2018 and 2021

Sector	2018 (MTCO2e)	2021 (MTCO2e)	Percentage Change, 2018 – 2021
Energy - Residential built environment	43,450	47,470	9%
Energy - Commercial/industrial built environment	23,160	21,900	-5%
Transportation	97,170	102,570	6%
Solid waste generation	8,470	8,790	4%
Water	2,100	3,160	50%
Wastewater	590	410	-31%
Off-road equipment	4,860	5,330	10%
Land use and sequestration	-220	-220	0%
Total	**179,580**	**189,410**	**5%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Figure 3: Community-Wide GHG Emissions for Laguna Beach in 2018 and 2021 ($MTCO_2e$)



- **Solid Waste:** GHG emissions from solid waste make up approximately 5 percent of the community's emissions and are caused by waste that is sent to decompose in a landfill or burned.
- **Water and Wastewater:** Water and wastewater make up less than 5 percent of total emissions from the community. GHG emissions in these sectors are also largely driven by the type of fuel used, whether that be electricity derived from fossil fuels for water and wastewater pumping. The processes used for treating wastewater also affect GHG emissions from these activities.
- **Off-Road Equipment:** This sector also accounts for less than 5 percent of emissions, driven by fuel type (e.g., gasoline or diesel) and equipment usage.

Key Trends

Emissions from transportation increased by size and percentage between 2018 and 2021. While vehicles became more fuel-efficient and more people are driving hybrid and electric vehicles, the number of miles driven by Laguna Beach residents, workers, and visitors increased between 2018 and 2021. The COVID-19 pandemic likely played a role in increasing the number of miles driven in vehicles as it resulted in slightly more people opting to drive alone in personal vehicles versus carpooling or taking transit. There is also a slight increase in commute distance from 2018 to 2021 that may have affected miles traveled.

Emissions from the residential built environment increased by 9 percent between 2018 and 2021, which includes electricity and natural gas use. This is likely due to an increase in natural gas use and higher proportion of electricity generated from nonrenewable sources in 2021 versus 2018. Southern California Edison sourced a higher proportion of power from nonrenewable sources, mainly natural gas, in 2021 than in 2018.

Emissions from commercial and industrial buildings decreased 5 percent between 2018 and 2021 due to a decrease in electricity and natural gas use. This could be attributed to a decrease in commercial activity as more people worked from home and many businesses maintained limited hours of operation following the COVID-19 shelter-in-place period.

Emissions from water use increased by 50 percent primarily due to a difference in methods between the 2018 and 2021 inventories, as well as differences in the availability of data. Emissions from wastewater activities declined 31 percent during this period, likely due to similar methodological differences and data availability as the water sector.

Government Operations Emissions

Table 3 and **Figure 4** show the GHG emissions produced by each sector of City government operations during the inventory years.

- **Energy:** Energy remained the highest emitter of greenhouse gases with a 2 percent decrease in emissions between 2018 and 2021.
- **Employee Commutes:** Emissions from employee commute decreased by 25 percent, driven by more employees working from home, reducing vehicle travel to City facilities.
- **Transit:** Transit emissions fell by 78 percent, reflecting reduced local trolley service and fuel usage during the pandemic.
- **City Fleet Vehicles:** City fleet vehicle emissions increased by 114 percent, which is likely due to methodological differences between the 2018 and 2021 inventories.

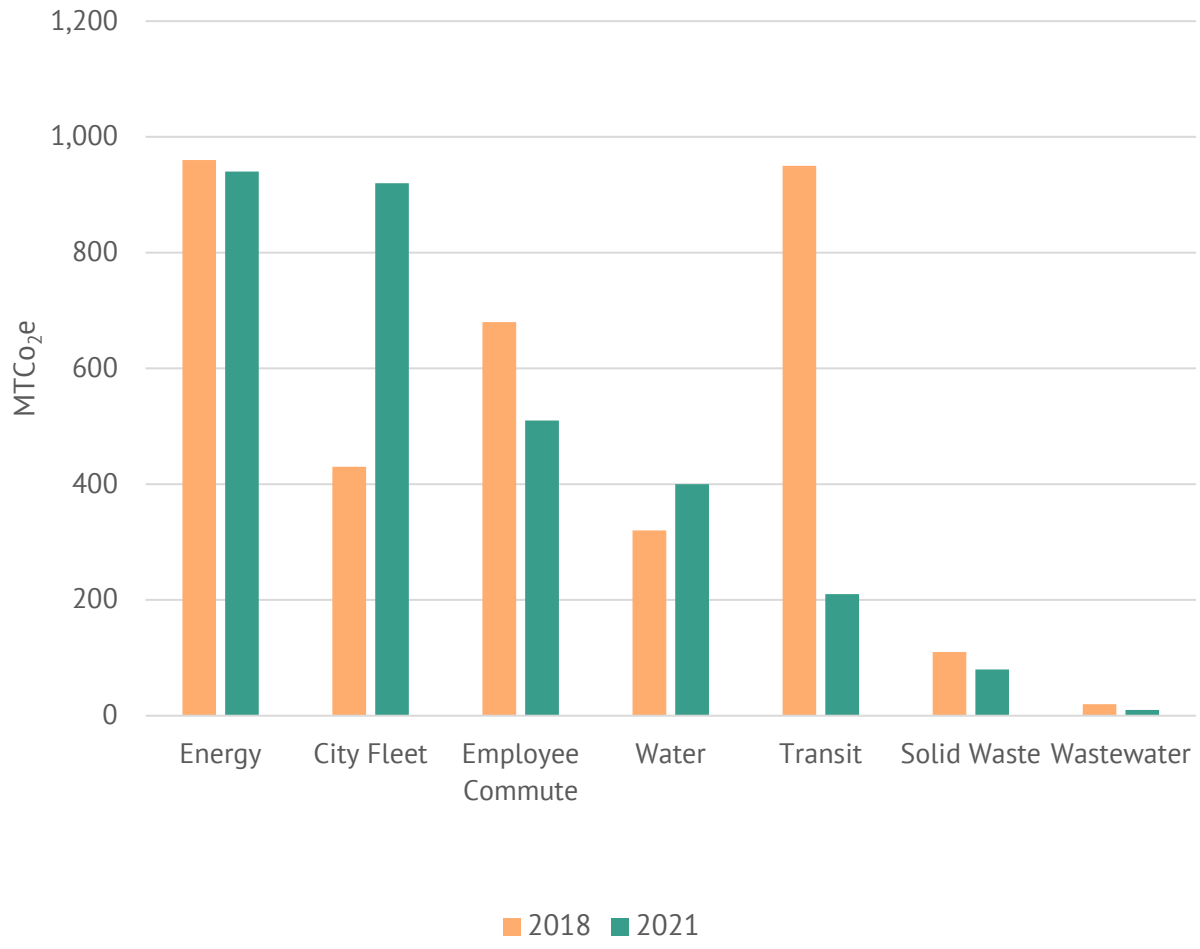
- **Solid Waste:** Emissions from City facilities decreased by 27 percent, likely corresponding with reduced office presence and waste generation.
- **Water and Wastewater:** Emissions rose by 25 percent, primarily due to higher energy use for water treatment and an increased emission factor for Southern California Edison in 2021. Wastewater emissions declined by 50 percent, largely due to methodological changes and rounding. Total municipal water use and wastewater generation decreased by approximately 7 percent.

Table 3: Laguna Beach Government Operations GHG Emissions in 2018 and 2021

Sector	2018 ($MTCO_2e$)	2021 ($MTCO_2e$)	Percentage Change, 2018-2021
Energy	960	940	-2%
Employee Commute	680	510	-25%
Transit	950	210	-78%
City Fleet	430	920	114%
Solid Waste	110	80	-27%
Water	320	400	25%
Wastewater	20	10	-50%
Total	**3,480**	**3,070**	**-12%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Figure 4: Laguna Beach Government Operations GHG Emissions in 2018 and 2021 ($MTCO_2e$)



Key Trends

GHG emissions from government operations decreased by 12 percent between 2018 and 2021. Decreased employee commuting, office energy use, and transit operations contributed significantly to the overall reduction in emissions. The relative proportion of emissions from the different sectors shifted from 2018 to 2021, which is largely due to the impact of the COVID-19 shelter-in-place orders. In 2021, more employees were working from home, which resulted in less energy use in buildings, less waste produced, and fewer people commuting to City facilities and offices.

Community members also used transit less in 2021, resulting in lower GHG emissions from the propane-fueled local trolleys. Between 2018 and 2021, the City also transitioned to an on-demand service that uses smaller vehicles.

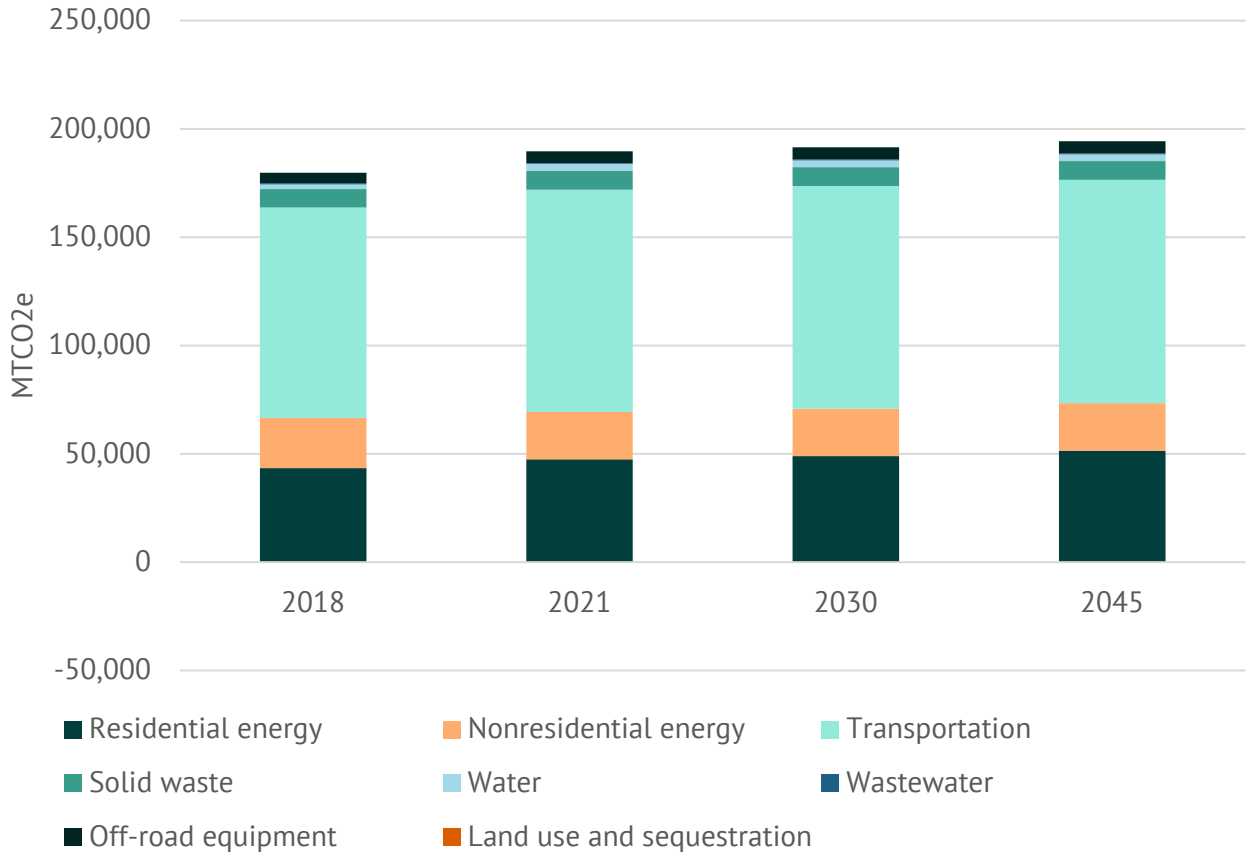
See **Table 3** and **Figure 4** for GHG emissions from City government operations in 2018 and 2021. Methodological differences and shifts in energy sources influenced emissions in fleet vehicle and water-related sectors.

GHG Emissions Forecast

The forecast is Laguna Beach's projection of future community-wide and government operations GHG emissions. It illustrates how emissions are expected to change over time. This is also known as a "business as usual" (BAU) or worst-case scenario, since it assumes that there is no new action taken to reduce GHG emissions and that each individual Laguna Beach City employee or community member continues to produce the same per-person amount of GHG emissions. The GHG emission forecast is informed by demographic indicators, such as City population, households, and jobs. As the City adds employees and grows in population, the BAU forecast assumes emissions will increase proportionally. The forecast allows local jurisdictions to identify gaps between projected GHG emissions and their GHG emission reduction targets, enabling them to develop policies or strategies to close those gaps. For this CAAP, the project team forecasted GHG emissions to 2030 and 2045 to align with the timeframe of the GHG emission reduction targets.

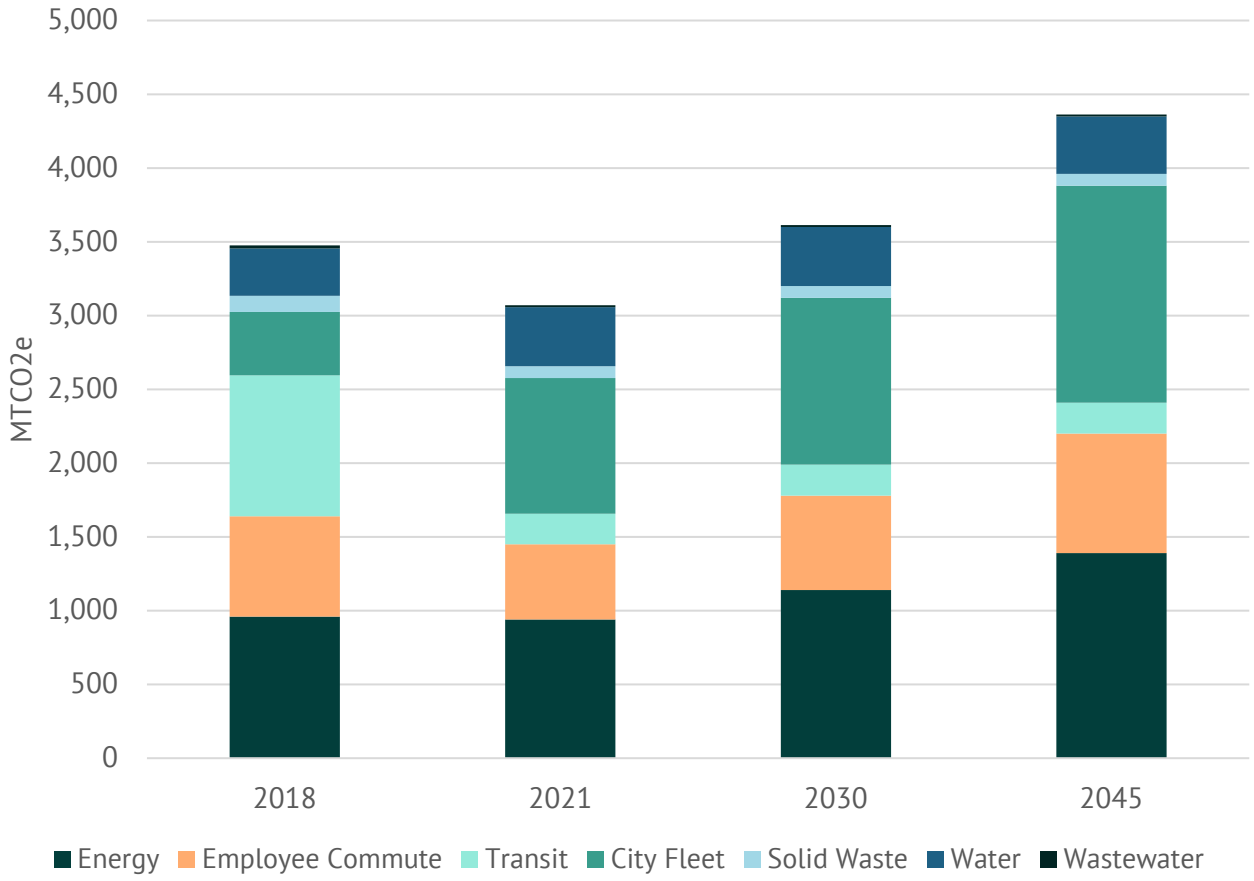
Figures 5 and **6** show the change in Laguna Beach's community-wide and government operations GHG emissions in a BAU scenario. If the community does not take any community-wide action, GHG emissions remain relatively constant, increasing by approximately 2 percent between 2021 and 2045 owing to the very limited growth the community is expected to see over this period. GHG emissions from government operations are projected to increase 42 percent between 2021 and 2045, driven by a projected increase in City staff employment.

Figure 5: Community-Wide GHG Emissions in Laguna Beach ($MTCO_2e$)



Note: Emissions from 2018 and 2021 are from the GHG emissions inventory and are compared here to the forecasted years of 2030 and 2045.

Figure 6: Government Operations GHG Emissions in Laguna Beach ($MTCO_2e$)



Note: Emissions from 2018 and 2021 are from the GHG emissions inventory and are compared here to the forecasted years of 2030 and 2045.

Climate Change Vulnerability Assessment

The City of Laguna Beach prepared a Vulnerability Assessment to analyze how climate change may harm the community and which population groups, aspects of community identity, and community assets are vulnerable. The Vulnerability Assessment analyzes Laguna Beach's people, buildings, infrastructure, community services, economic drivers, and ecosystems to determine how they may be susceptible to these hazards, as well as the way that these diverse community features combine to contribute to Laguna Beach's unique community identity and quality of life. It identifies the **priority vulnerabilities**, which are the people, natural systems, buildings, infrastructure, and community activities that will be the City's priorities for adaptation and resilience planning based on their level of vulnerability and importance to the community.

The Vulnerability Assessment informs community members, City staff, and decision makers about potential future hazard conditions, public safety issues, and welfare concerns. This helps the community allocate resources to the people and community assets that are most vulnerable, letting the community prepare for the future by improving resilience.

The Vulnerability Assessment identified 13 distinct hazards that pose a threat to Laguna Beach.


Wildfire and Smoke


Mudflows and Landslides


Inland Flooding


Severe Weather


Extreme Heat


Sea Level Rise


Emergent Groundwater


Human Health Hazards


Drought


Fog


Dune and Bluff Erosion


Ocean Acidification


Coastal Flooding

Climate Hazards Affecting Laguna Beach

Wildfire and smoke create the largest number of priority vulnerabilities in Laguna Beach, and can impact virtually all aspects of the community, including community identity and quality of life. Nearly all of Laguna Beach and its surrounding 16,000 acres of open space are designated by CAL FIRE as a Very High Fire Hazard Severity Zone (**Figure 7**). This designation underscores the significant wildfire risk in the city. Laguna Beach has a hilly terrain, significant vegetation that is fuel for wildfires, and is subject to hot, dry summer and fall seasons and high-speed Santa Ana winds. These conditions are frequently involved in the most destructive fires in the region. Laguna Canyon in particular is severely vulnerable to wildfire given its steep topography. Laguna Canyon Road/Highway 133, which serves as a critical evacuation route, may be blocked during a fire.

Given the topography of Laguna Beach, the community is at high risk for **mudflows and landslides**, which are compounded by other hazards like severe storms, drought, and wildfire. According to Laguna Beach's LHMP, approximately a third of community residents live in a landslide hazard zone, exposing them to risks of injury or property damage. Laguna Canyon Road and Pacific Coast Highway run through landslide zones, creating the risk that a landslide may block these roads and restrict ingress and egress to and from Laguna Beach. Landslides in coastal areas can also impact beaches and therefore the economy.

Inland flooding due to consistent moderate or heavy rain places people and infrastructure at risk. The areas considered flood-prone are likely to expand due to climate change as heavy rainfall events are projected to become more frequent and intense. Laguna Beach's most prominent flood hazard zones are along Rim Rock Drive and Laguna Canyon Road (**Figure 8**). These areas face a higher risk of flood-related injury and property damage as a result. Flooding can also exacerbate landslide risk in these zones.

Severe weather, such as intense winds, lightning, and hail, can directly impact populations and infrastructure as well as have secondary effects such as scheduled or unplanned power outages. Severe weather is projected to become more frequent and intense because of climate change, damaging buildings and infrastructure and disrupting the services that depend on these structures. This can include breakdown of communication systems and economic harm. Power outages can also harm residents who depend on medical devices and interrupt EV charging, which may in turn hinder evacuation efforts.

The frequency of **extreme heat days** and warm nights is expected to increase with climate change (**Figure 9**). Extreme heat can cause heat-related illnesses, such as heat cramps, heat exhaustion, and heat stroke, and worsen respiratory and cardiovascular conditions. Some areas of Laguna Beach are more vulnerable to high heat than others. These areas, known as urban heat islands, are areas where the average temperature is hotter than the average temperature for Laguna Beach as a whole. These urban heat islands are near Laguna Beach High School, Poplar Street north of High Drive, in the neighborhood surrounding Top of the World Elementary School, the intersection of Noria Street and Capistrano Avenue, and the intersection of Santa Ana Street and Cortez.

Figure 7: Observed and Projected Extreme Heat Days

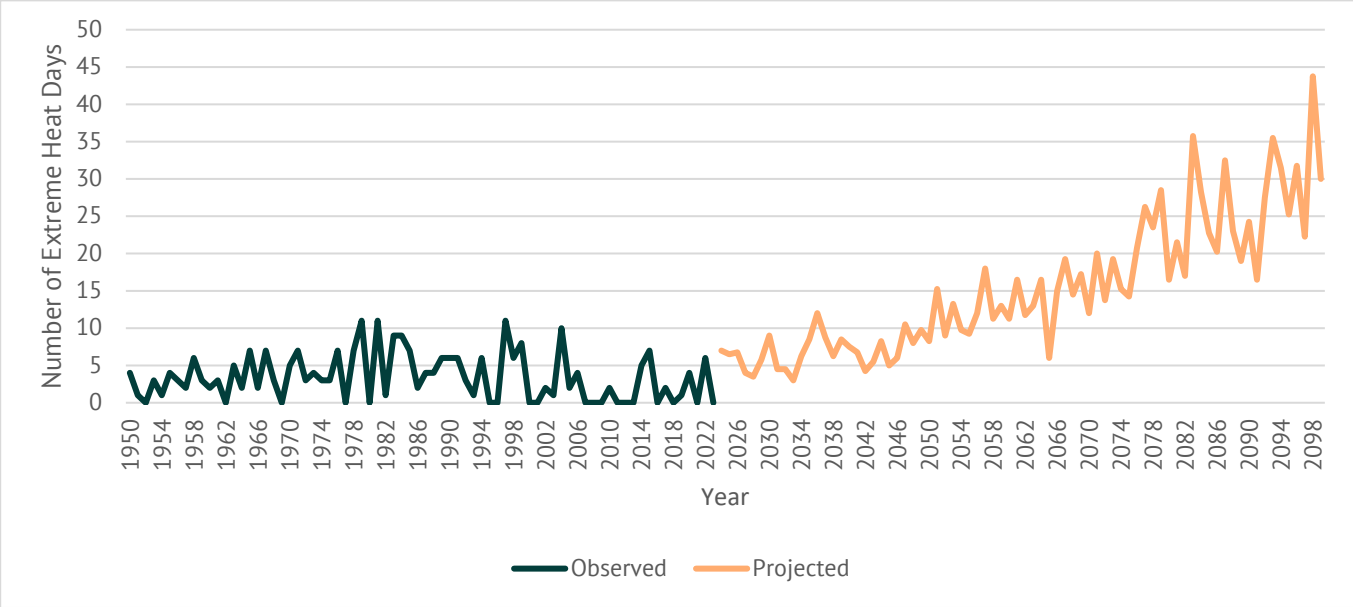


Figure 9 uses observed data from the Cal-Adapt database, which provides data from 1950 to 2005; the nearest National Weather Service weather stations, which provides data from 2006 to 2023; and projected data from the Cal-Adapt database, which provides data from 2024 to 2099. Because of the different database sources, the observed and projected data may not match.

Figure 8: Very High Fire Hazard Severity Zones

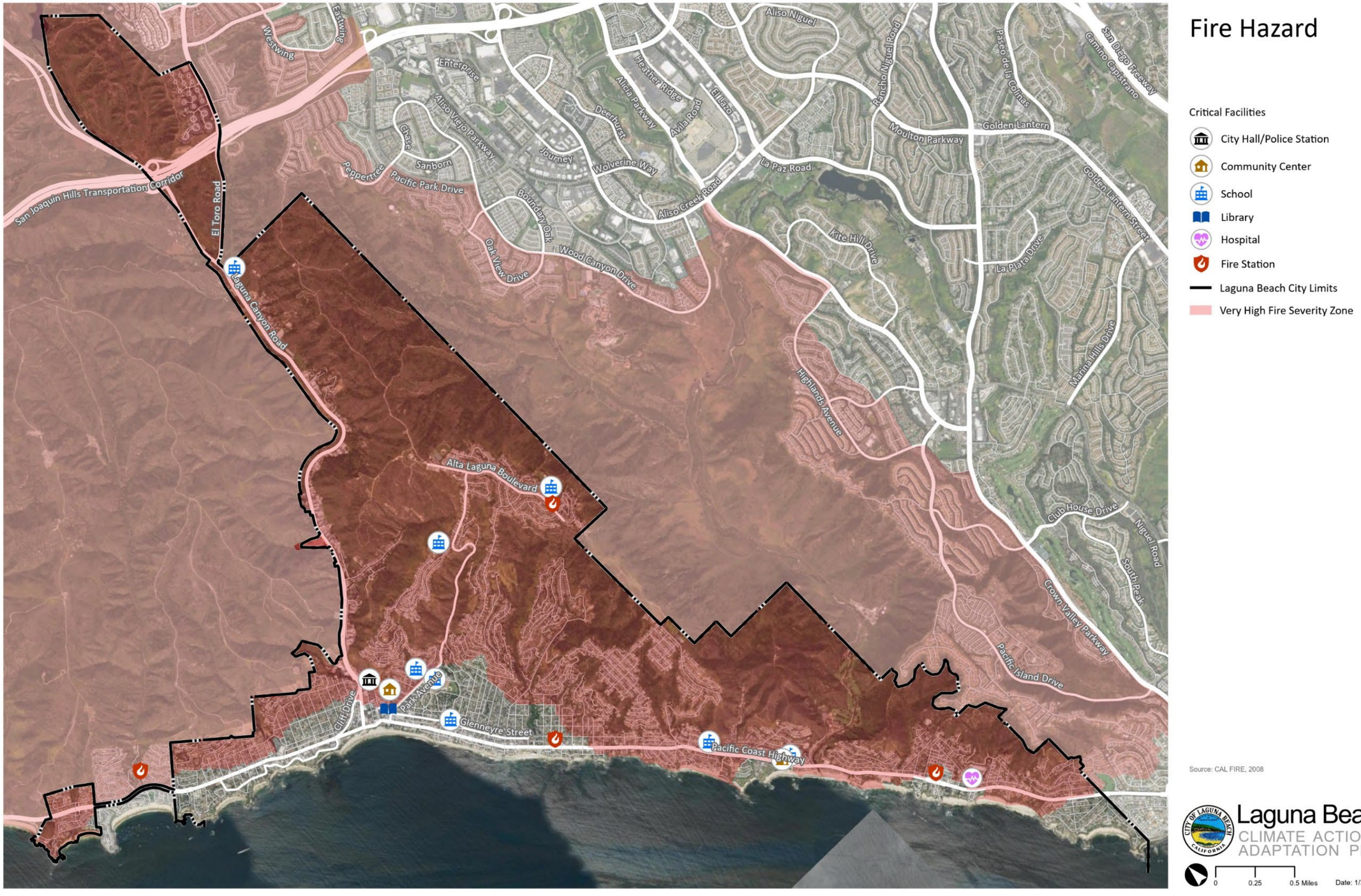


Figure 9: 100- and 500-Year Flood Zones

Flood Hazard Zones

Critical Facilities

- City Hall/Police Station
- Community Center
- School
- Library
- Hospital
- Fire Station
- Laguna Beach City Limits
- FEMA 100 Year Flood Zone
- FEMA 500 Year Flood Zone

Source: FEMA 2022

Laguna Beach
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0 0.25 0.5 Miles

Date: 1/31/2024

Sea Level Rise Policy Guidance

The California Coastal Act is one of the state's primary coastal management laws for addressing land use, public access and recreation, and the protection of coast and ocean resources in the coastal zone. In 2015, the California Coastal Commission adopted their Sea Level Rise Policy Guidance for local governments, and most recently updated the guidance in November 2024. The Sea Level Rise Policy Guidance provides a comprehensive framework for how to apply the Coastal Act to the challenges presented by sea level rise. It emphasizes proactive planning to protect coastal resources, infrastructure, and communities, while prioritizing natural shoreline processes and public access.

Sea level rise is expected to increase the frequency and intensity of coastal flooding along the Laguna Beach shoreline. Sea levels in Laguna Beach are projected to rise as much as 1.6 feet by 2050 and 6.6 feet by 2100, as shown in **Figures 10** and **11**. Depending on the exact nature of future climate conditions, sea level rise and coastal flooding during a significant storm* could combine to impact significant portions of the Laguna Beach coastline, flooding up to 85 homes and 24 streets as far inland as Downtown Laguna Beach. **Figures 10** and **11** highlight the additional areas that could be temporarily inundated during a 100-year storm with 1.8 or 6.7 feet of sea level rise.

Sea level rise can force groundwater to rise, and in some places rise high enough to emerge to the surface, creating a hazard called **emergent groundwater.** This is expected to flood low-lying inland areas, such as downtown Laguna Beach and areas near Aliso Creek (**Figure 12**). Rising groundwater levels can damage buried infrastructure, flood underground structures, reduce storm and sanitary sewer capacity, release subsurface soil contaminants, compromise structural foundations, and create an urban flood hazard that can amplify overland storm flooding. This can block access and force buildings to close, resulting in economic harm to the community.

Human health hazards from disease-carrying animals that are considered pests, such as mice and rats, mosquitos, and ticks pose a risk in Laguna Beach, especially near areas of standing water. Warmer temperatures and increased precipitation increase pest populations by expanding pest ranges and hours of activity and accelerating pest life cycles. Human health hazards that are of concern to Laguna Beach and the region include West Nile Virus, Zika Virus, and ticks.

Increased or prolonged instances of **drought** also pose a threat to Laguna Beach's water supply, which comes from multiple sources, including local groundwater and imported water from the Sierra Nevada (via the State Water Project), Colorado River, and Owens River. Droughts are regional events, so all parts of Laguna Beach face the same drought risk. Given the distributed

* The 100-year storm was used to model and project the relationship between sea level rise and storm events in this report. A 100-year storm is a storm that, based on historical conditions, has a 1 percent chance of occurring in any given year.

nature of Laguna Beach's surface water sources, it is possible for the city to experience a "long distance drought", in which drought conditions in the Sierra Nevada or along the Colorado River watershed may impact the city's water supply. Droughts can harm landscapes because plants do not get the water they need to survive. In severe cases, droughts may lead to a human health risk if available water supplies are insufficient to meet basic needs. Drought causes soil to dry out, causing soil compaction and preventing the absorption of water into the ground, which may increase flood risk and make soils more susceptible to erosion.

Ocean acidification, or the ocean becoming more acidic, refers to the ocean absorbing carbon dioxide (CO_2) from the atmosphere. Once absorbed, carbon dioxide reacts with seawater to form an acid called carbonic acid. Ocean acidification is best known for its osteoporosis-like effects on shellfish, which makes building and maintaining shells difficult for these creatures, causing harm to the ocean food web. Ocean acidification may also cause illness in humans who eat shellfish. Estimates of future carbon dioxide levels indicate that the surface waters of the ocean could be nearly 150 percent more acidic by the end of this century if global emissions are not significantly reduced.

Finally, **fog** levels in Laguna Beach may decrease with a warming climate. In Laguna Beach, fog provides a cooling effect for the area and coastal vegetation with water supply. Climate change is likely to decrease the frequency and extent of fog. A reduction in fog may exacerbate the effects of drought and extreme heat.

Figure 10: Sea Level Rise in 2050

Sea Level Rise

Critical Facilities

- City Hall/Police Station
- Community Center
- School
- Library
- Hospital
- Fire Station
- Laguna Beach City Limits
- 1.6 feet Sea Level Rise - Permanent Flooding
- 1.6 feet Sea Level Rise - Temporary Flooding - 100 Year Storm

Source: CoSMoS 2021

Laguna Beach
CLIMATE ACTION & ADAPTATION PLAN

0 0.25 0.5 Miles

Date: 1/31/2024

Figure 11: Sea Level Rise in 2100

Sea Level Rise

Critical Facilities

- City Hall/Police Station
- Community Center
- School
- Library
- Hospital
- Fire Station
- Laguna Beach City Limits
- 6.6 feet Sea Level Rise - Permanent Flooding
- 6.6 feet Sea Level Rise - Temporary Flooding - 100 Year Storm

Source: CoSMoS 2021

Laguna Beach
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0 0.25 0.5 Miles

Date: 1/24/2024

Figure 12: Emergent Groundwater Due to Sea Level Rise in 2100

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Cascading and Compounding Hazards

Each hazard considered in the Vulnerability Assessment has the potential to significantly affect the health, functionality, and well-being of Laguna Beach's communities, services, ecosystems, and infrastructure. However, these hazards do not exist in isolation. The effects of any given climate change hazard can have cascading or compounding effects on the city's populations, infrastructure, and ecosystems, meaning that impacts can be amplified, and the city can become more vulnerable to the impacts of additional climate hazards. Hazards compound when multiple types of hazards take place at the same time, such as when a landslide occurs during a severe storm. Cascading hazard effects play out over longer time scales, as the effect of one hazard changes the city's ecosystems or infrastructural networks in a way that increases vulnerability to future hazards. **Figure 13** provides an example of these cascading effects.

Figure 13: Example of Cascading Effects

Awareness of the cascading and compounding nature of these hazards helps identify both priority hazards and those assets and populations that may be especially vulnerable when hazards interact or coincide. For instance, low-resourced households, particularly those in mapped hazard areas, may not have sufficient financial resources to adequately address the compound effects of flooding and landslide, or high heat, wildfire, and drought. While planning for hazard response and allocating resources, it is important to keep in mind that emergency services and key infrastructure such as roads, electric poles and wires, and flood control structures must be resilient to the potentially compounding effects of multiple hazards.

Considering the interactive nature of climate hazards can also help identify locations that are most vulnerable. For example, there are several locations in Laguna Beach that are vulnerable to both flooding and wildfire. These areas, shown in **Figure 14**, are mostly along Laguna Canyon Road and Aliso Creek.

Vulnerable Populations and Assets

Climate change vulnerability describes the degree to which a community's people, places, and key community activities may be harmed by climate change hazards. Vulnerability is not a static characteristic of any person or community feature but can change according to an individual's likelihood of exposure to a given climate hazard, sensitivity to that hazard, and the available resources to support adaptation. Climate change is likely to affect all people and community assets in Laguna Beach. However, these effects are not evenly distributed, and some people and assets are likely to be disproportionately affected. The following describes the populations and community assets that are considered priority vulnerabilities. Senior citizens, people with limited mobility or health concerns, and local artists are the populations that are particularly vulnerable.

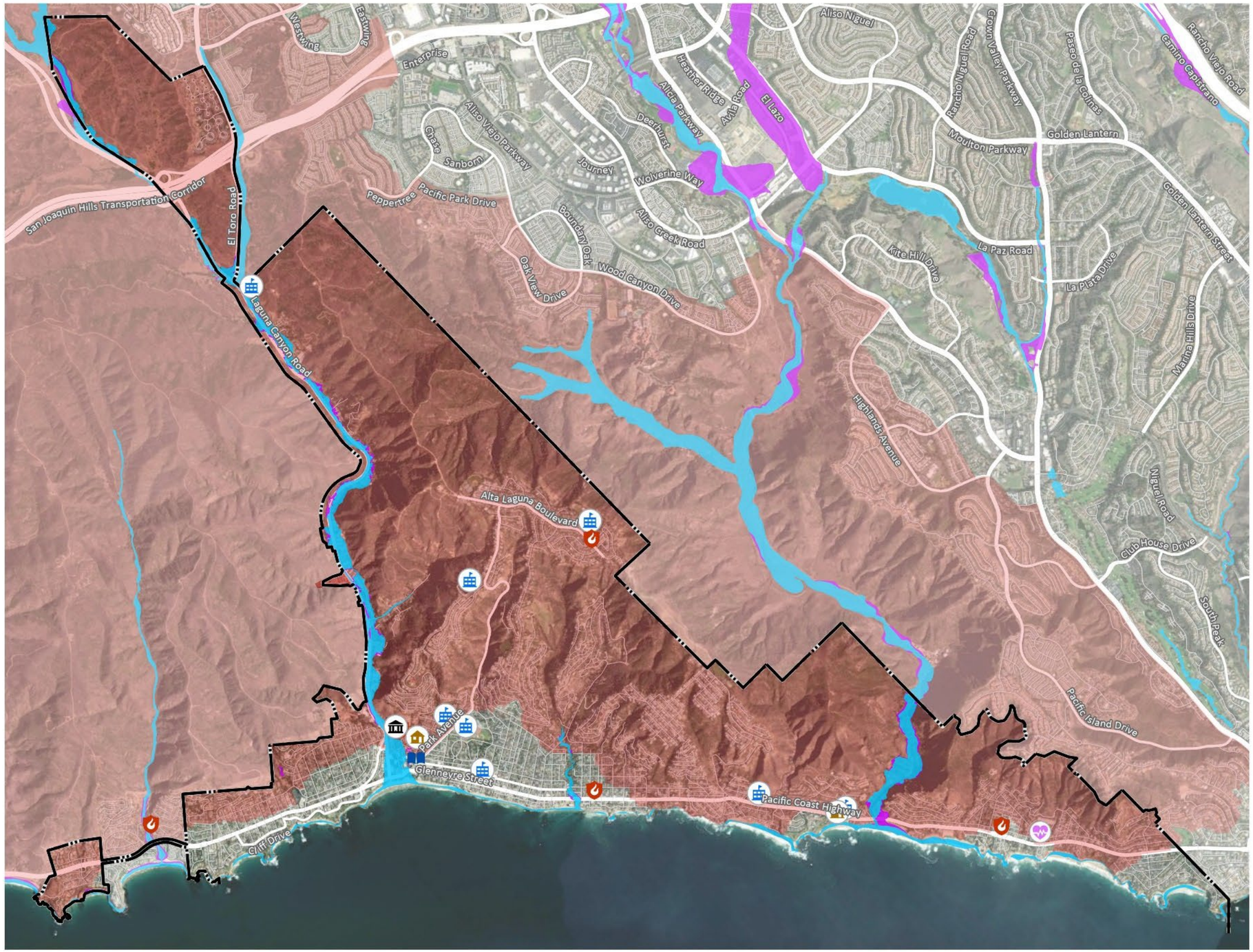
Senior Citizens

Senior citizens (age 65+), who make up about a quarter of Laguna Beach residents, often face challenges in planning for and responding to emergency conditions, including evacuating, obtaining resources, and making changes to their home to better resist the effects of hazards. Some senior citizens have underlying medical conditions or rely on medication that can compound these challenges. Senior citizens often face similar difficulties as people with limited mobility or health concerns.

According to the American Community Survey, senior-headed households in Laguna Beach have incomes 34 percent below those with a household between 45 and 64 years of age, and 14 percent below Laguna Beach's median household income. According to the American Community Survey, approximately 13 percent of households in Laguna Beach are senior citizens living alone.

Senior citizens also receive, on average, less income than middle-aged adults. While some continue to work in high-income positions or have ample financial resources due to retirement funds or other investments, many have limited, fixed incomes, which can increase their vulnerability to hazard events. Seniors living alone face additional challenges, as they may not be able to get the necessary assistance to prepare for and respond to hazardous conditions.

Figure 14: Fire Hazard and Flood Zones



Fire Hazard & Flood Zones

Critical Facilities

- City Hall/Police Station
- Community Center
- School
- Library
- Hospital
- Fire Station
- Laguna Beach City Limits
- Very High Fire Severity Zone
- FEMA 100 Year Flood Zone
- FEMA 500 Year Flood Zone

Source: CAL FIRE, 2008, FEMA 2022

Laguna Beach
CLIMATE ACTION & ADAPTATION PLAN

0 0.25 0.5 Miles

Date: 10/23/2023

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Persons with limited mobility or health concerns

Persons with reduced mobility and individuals with chronic illnesses or disabilities, including those with access and functional needs, may face barriers to receiving emergency alerts, evacuating, obtaining support resources, as well as installing appliances and making retrofits or structural improvements to their homes to improve resilience. These individuals may also have pre-existing conditions or medications that make it more difficult to fight off new illnesses or be more sensitive to the health effects of high heat or smoke.

According to the City's LHMP, 12 percent of households in flood hazard areas include an individual with a disability. According to the American Community Survey, 15 percent of Laguna Beach households in or near the Pacific Coast Highway have at least one person with a disability. Potential flooding and inundation of roads may make it harder for these people to travel to health care or for emergency services to reach them. These individuals may be more likely to be injured or become ill due to flooding and may be reliant on medications or medical devices that may be lost, damaged, or rendered inoperable due to a flood. Those who rely on electricity to operate medical devices or store medication may be especially vulnerable in the event of a public safety power shutoff or other loss of power, which may become more likely during periods of extreme heat, severe weather, flooding, wildfire, and landslide.

Local artists

The arts are a core part of Laguna Beach, made possible by the local artists who have helped make the city internationally known for its arts culture. Climate change poses a significant threat to these vital members of the community, who are already facing several other challenges. Many artists lack a steady and reliable income, which hinders their ability to make improvements to their homes so they can be better prepared for natural hazard events. These financial strains can be exacerbated by medical costs, particularly if they lack effective health insurance, and illnesses can further reduce artists' ability to work and earn income. More generally, damage to studios, galleries, and other arts venues directly harms local artists, who may be unable to exhibit their work elsewhere. Major disasters can also reduce tourism activity in Laguna Beach, depriving artists of income and recognition.

The high cost of housing in Laguna Beach has hit local artists particularly hard. Moving out of Laguna Beach is often not an option, as some events, such as the Sawdust Art Festival's summer show, require that artists be full-time residents of the city. As a result, many artists have moved into studio spaces in Laguna Canyon to save on housing costs. These spaces are in a Very High Fire Hazard Severity Zone, as well as areas prone to flooding and landslides, significantly increasing the artists' exposure to natural hazards. Many of these studio spaces are also not designated as residential units, which can complicate emergency response efforts as emergency managers may not be aware that people are living in these spaces, and so these artists may not receive evacuation or emergency notices or assistance.*†

Laguna Beach has a storied history as a thriving artistic enclave. This legacy is alive and well today, as Laguna Beach continues to serve as a home for established and aspiring artists, as well as a sweeping variety of art galleries, museums, artistic events, and a private college devoted to the arts.

"Low-resourced households" includes low-income households, households in poverty, overcrowded households, and cost-burdened households. [5,6]

Other Priority Vulnerabilities

In addition to senior citizens, persons with limited mobility and health concerns, and members of the local artist community, many other populations and assets in Laguna Beach are considered priority vulnerabilities. Additionally, the lack of a priority vulnerability designation does not mean that there is no risk of harm, and Laguna Beach will likely still need to provide support and assistance to reduce the threat to these populations and assets. For the full description of the vulnerabilities of these populations and assets, see the full Vulnerability Assessment report on the City of Laguna Beach's website.‡

Medical and emergency facilities and services include hospitals, medical offices and clinics, ambulance services, and firefighting services, building, and equipment. The City's senior services also play an important role in supporting community health and well-being. During an emergency, medical and emergency services may be the first place that people turn to protect their health and safety.

* Overcrowding is typically defined as more than one person per room, based on the Census Bureau's definition of "room", which excludes bathrooms, porches, balconies, foyers, halls, or half-rooms. Severe overcrowding occurs when there are more than 1.5 persons per room.

† For housing costs to be considered affordable, a household's total housing costs should not exceed 30 percent of household income, according to the US Department of Housing and Urban Development. Households paying more than 30 percent of income toward housing are considered housing "cost-burdened" and those with housing costs that exceed half of their income are considered "severely cost-burdened."

‡ City of Laguna Beach, 2024, https://www.lagunabeachcity.net/home/showpublisheddocument/18425/638487716525200000.

At 1.6 feet of sea level rise, about 10 single-access roads are projected to be impacted by bluff erosion. At 6.7 feet of sea level rise, approximately 28 roads and alleys that are single-access roads are projected to be impacted by bluff erosion.

Laguna Beach's ribbon of 26 beaches is one of its most well-known and beloved features. Each beach is a rich and delicate ecosystem home to a variety of coastal creatures, as well as host to surfers, artists, nature enthusiasts, and everyone looking for a place to relax and cool off. However, climate change threatens the safety, longevity, and health of these unique places.

At a projected 1.6 feet of sea level rise, 50 storm drains may be impacted by bluff erosion. At a projected 6.7 feet of sea level rise, 101 storm drains may be impacted by bluff erosion. With 1.6 feet of sea level rise, 11 storm drains are projected to be permanently inundated. With 6.7 feet of sea level rise, 17 storm drains are projected to be permanently inundated.

With 6.7 feet of sea level rise and a 100-year storm event, four hotels may be vulnerable to coastal flooding. There are 16 hotels in or near mapped landslide hazard zones and Montage Laguna Beach (a hotel and major employment center) is in the city's mapped wildfire hazard zone.

These other priority vulnerabilities include:

- Children under 10 years of age
- Low-resourced households
- Outdoor workers and individuals experiencing homelessness
- People living on single-access roads
- People of color and linguistically isolated people
- Persons without access to lifelines
- Short-term visitors
- Beaches and bluffs
- Arts and culture
- Energy and communication infrastructure and services
- Flood protection and stormwater infrastructure and services
- Hazardous materials sites
- Homes
- Hotels and lodging
- Medical and care facilities, emergency, and senior services
- Retail and commercial buildings and activity
- Transportation infrastructure and services
- Water infrastructure and services
- Wastewater infrastructure and services
- Community greenbelts and outdoor spaces

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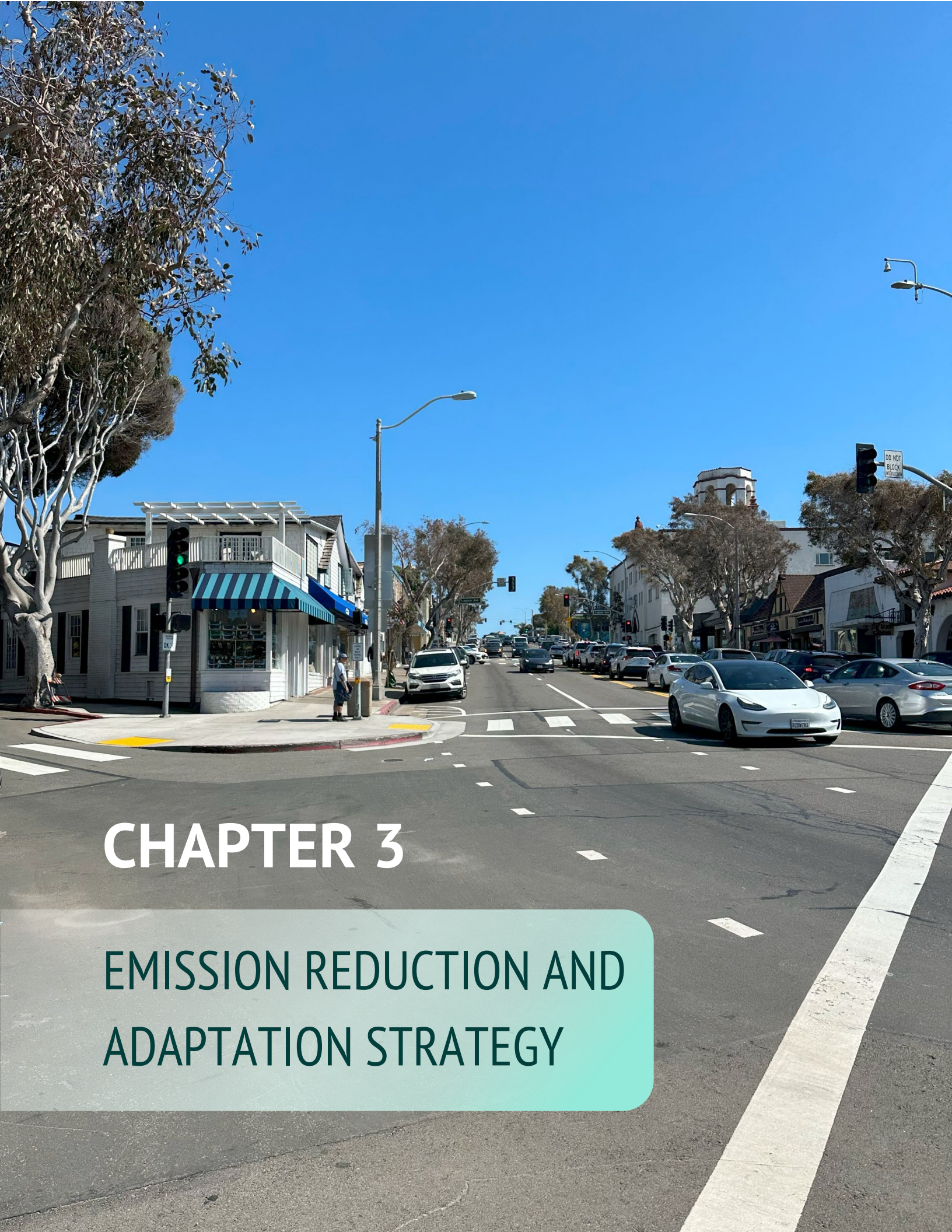


CHAPTER 3

EMISSION REDUCTION AND ADAPTATION STRATEGY

EMISSION REDUCTION AND ADAPTATION STRATEGY

The Laguna Beach CAAP creates a clear pathway to reducing GHG emissions and improving resilience to climate hazards. To achieve the GHG emission reduction targets and resiliency goals, the CAAP includes new strategies meant to improve the adaptive capacity of Laguna Beach and reduce GHG emissions from community-wide activities and government operations. Six priority strategies are identified to ensure the greatest potential GHG emission reductions and respond to the most pressing natural hazard identified by the community. The complete set of strategies achieves the GHG emission reduction target by 2045 and improves Laguna Beach's resilience to a variety of hazards that pose the greatest threat to the community.

The Laguna Beach CAAP pathway is a roadmap to reduce GHG emissions and adapt to changing climate conditions over time by implementing specific policies and actions. The pathway identifies key sectors—such as transportation, energy, and waste management to lower emissions, enhance climate resilience, and establish measurable targets for success. A pathway typically includes short-term and long-term goals and associated strategies to help guide the community toward meeting regional and local GHG emission targets and improved adaptation. The pathway approach is flexible, allowing Laguna Beach to adjust implementation as needed to respond to new challenges and opportunities. This chapter identifies the short- and long-term goals of the GHG emissions reduction and adaptation pathways, the strategies to achieve these goals, and their overall benefits to Laguna Beach.

It should also be noted that the strategies are focused on items that the City is able to address. For example, transportation is the largest contributor to GHG emissions, which makes it essential to recognize the significant impact of visitor traffic on these emissions. While the City has limited ability to directly regulate visitor emissions, it can focus on actionable strategies

within its control. These include encouraging transit use and implementing policies that support sustainable transportation options.

GHG Emissions Reduction Targets

The State of California provides guidance to local governments on GHG emission reduction targets through the State's own GHG reduction targets, plans, and guidance documents. As discussed in **Chapter 1**, the Scoping Plan identifies the state-level targets. It also identifies local jurisdictions as key partners in the State's efforts to reduce GHG emissions and provides guidance for local jurisdictions to establish GHG emission reduction targets that align with the State's.

California has two statewide GHG emission reduction targets:	
➤ Reduce GHG emissions to 40 percent below 1990 levels by 2030. This goal was codified into law by SB 32.	➤ Reduce GHG emissions to 85 percent below 1990 levels and achieve net carbon neutrality by 2045. This is the goal codified by AB 1279.

The first Scoping Plan, adopted in 2008, identified local governments as a critical factor in the State's efforts to reduce GHG emissions and encouraged cities and counties to adopt the same GHG emission reduction targets as the State, which compares future GHG emission levels to those of 1990. Recognizing that many local jurisdictions did not have the data needed to calculate 1990 GHG emissions, the first Scoping Plan declared that reducing local GHG emissions 15 percent below "current" (2005–2010) levels by 2020 would be equivalent to reducing GHG emissions to 1990 levels for local governments. For this reason, many jurisdictions use a year between 2005 and 2010 as a baseline year for GHG emissions inventories and then estimate their 1990 level GHG emissions from that baseline. For the purposes of this CAAP, Laguna Beach uses 2005 as the baseline year for GHG emission inventories and forecasts, and estimates that 1990 GHG emission levels are 15 percent below that. See **Table 4** for a comparison of existing and forecasted GHG emissions.

Prior to this CAAP, the City of Laguna Beach had the following targets:	
➤ Reduce GHG emissions 7 percent below estimated 1990 levels by 2012 (2009 Climate Protection and Action Plan).	➤ Achieve net carbon neutrality by 2045 (Laguna Beach City Council Resolution No. 22.072, August 16, 2022).

This CAAP retains the existing target to achieve net carbon neutrality by 2045 and adds new targets to support statewide goals. The CAAP's targets are:

- Reduce GHG emissions by 40 percent below estimated 1990 levels by 2030.
- Reduce GHG emissions 85 percent below estimated 1990 levels and achieve net carbon neutrality by 2045.

Table 4: Laguna Beach Reduction Targets Compared to Existing and Forecasted GHG Emissions ($MTCO_2e$)

Targets	2021	2030	2045
Forecasted GHG emissions	189,410	191,320	194,120
Target	None	129,160	32,290
GHG emissions to be reduced	N/A	62,160	161,830

Existing State GHG Reduction Strategies

Laguna Beach must substantially reduce its GHG emissions to achieve its goals. Fortunately, there are already several efforts in place or planned at the State level that are expected to reduce GHG emissions in Laguna Beach without the City taking additional action. Many of these policies and actions are identified in the 2008 Scoping Plan and have been revised and expanded by successive Scoping Plan updates.

The Scoping Plan and related documents lay out several State-led policies to reduce GHG emissions, but four policies have a direct and apparent GHG emission reduction benefit to Laguna Beach: The Renewables Portfolio Standard (RPS), Clean Car Standards, Title 24 building energy efficiency standards, and the Short-Lived Climate Pollutant Reduction Strategy (see **Table 5**). The CAAP "credits" Laguna Beach for local GHG reductions achieved by these initiatives, even if the City or community members do not need to take any action to implement these efforts. The CAAP builds on these initiatives to go beyond what they achieve and address issues that they do not.

Table 5: State Policies to Reduce GHG Emissions

Policy	Summary
Renewables Portfolio Standard	The State established the RPS in 2002 and has amended it several times, most recently by SB 100 in 2018. RPS requires all electricity providers in the state to obtain at least 33 percent of their electricity from eligible renewable resources by the end of 2020 (a target met by both of Laguna Beach's electric providers), 60 percent of their electricity from eligible renewable resources by the end of 2030, and all of their electricity from carbon-free (although not necessarily eligible renewable) resources by the end of 2045. This law reduces GHG emissions from electricity use, including electricity used to transport and process water and wastewater, and electricity used for electric vehicles. The City's electricity providers, SCE and SDG&E, are required to comply with RPS and report on their progress.
Clean Car Standards	In 2002, California adopted Assembly Bill (AB) 1493, the New Passenger Motor Vehicle Greenhouse Gas Emission Standards, which requires a reduction in tailpipe GHG emissions from new vehicles produced from 2009 to 2015. The State has adopted a series of extensions to these standards that require increased levels of GHG reductions. Most recently, in 2022, the State adopted the Advanced Clean Cars II standards, which applies to vehicles produced from 2026 to 2035, and requires that all new light-duty vehicles sold in California be zero-emission by 2035. Similar standards, known as the Advanced Clean Trucks, Advanced Clean Fleets, and Innovative Clean Transit regulations, require GHG reductions for larger vehicles and organizations that operate vehicle fleets, including vehicles operated by the City of Laguna Beach. These standards reduce GHG emissions from transportation.
Title 24 Energy-Efficiency Standards	The California Building Standards Code establishes requirements for new and renovated buildings in the state. Part 6 (Energy Code) and Part 11 (Green Building Standards Code, or CALGreen), include energy-efficiency standards for new and renovated buildings, applied at the local level through the project review process. The standards are strengthened every three years. The most recent complete set of standards went into effect on January 1, 2023. This policy will reduce GHG emissions from electricity and natural gas use in new homes and nonresidential buildings.
California's Short-Lived Climate Pollutant Reduction Strategy (Senate Bill 1383)	California's SB 1383 aims to reduce GHG emissions from organic waste by requiring businesses and residents to separate their organic waste from other waste streams for recycling or composting. The law sets targets for reducing organic waste disposal in landfills by 75 percent by 2025 and requires local jurisdictions to implement organic waste recycling programs to meet these goals.

Existing Local GHG Reduction Actions

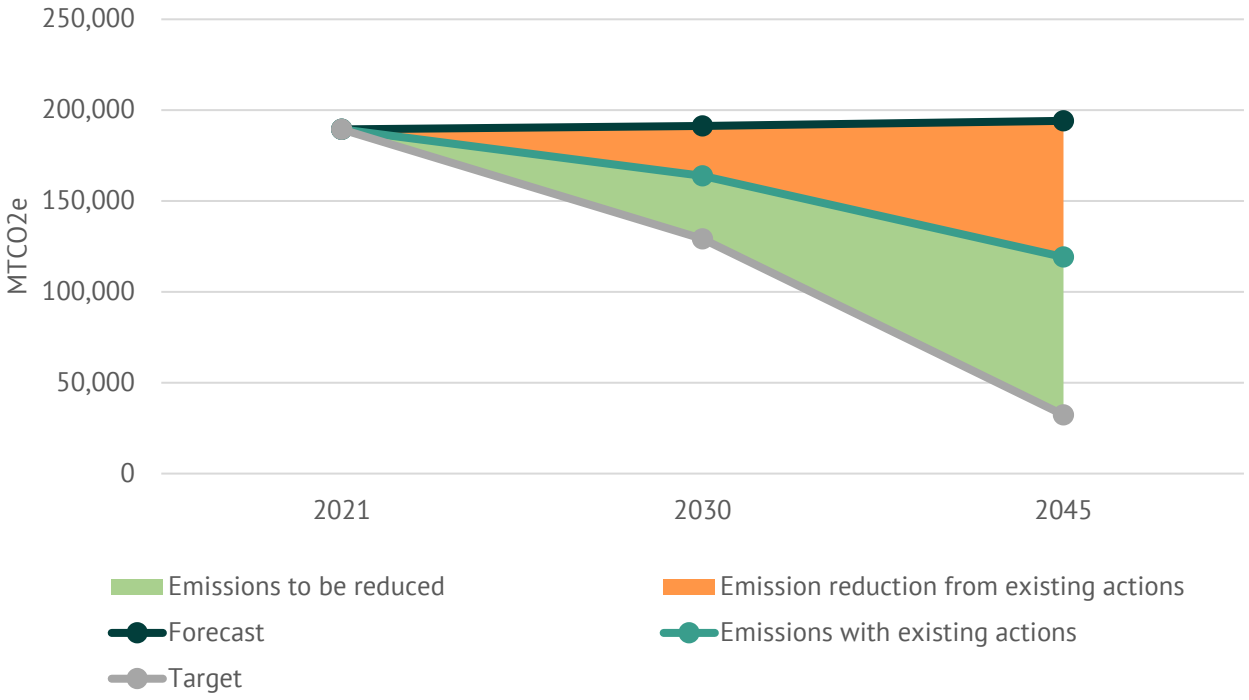
As of 2023, renewable electricity made up 66 percent of SCE's electricity supply and 67 percent of SDG&E's supply.

As discussed in **Chapter 1**, Laguna Beach has already begun to implement strategies to reduce GHG emissions from local government operations and community-wide, which are considered when calculating the progress towards the 2030 and 2045 GHG emission reduction targets. Since the CAAP uses 2021 as the most recent GHG emissions inventory year, it incorporates the contributions of the following local efforts from 2022 onward.

- **Converting streetlights to LEDs:** The City has replaced 443 streetlights with energy-efficient LED light bulbs, resulting in approximately 7,730 kWh per month.
- **Converting City facilities lighting to LEDs:** The City has upgraded the lighting in the City Council Chambers to energy-efficient LED light bulbs, saving approximately 1,500 kWh per year.
- **Street tree planting:** The City has planted a total of 37 new trees throughout the community. While the majority were to replace 31 existing trees that were previously removed, 6 new trees were added to streets and parks.
- **New bike lanes:** The City added 1.1 miles of new bike lanes to Laguna Canyon Road between El Toro Road and State Route 73 in 2024. This is in addition to the existing 3.1 miles of bike lanes included in the 2021 GHG emissions inventory year.
- **EV charging stations:** The City has installed 32 EV chargers that are publicly accessible.
- **Curbside composting service (2022):** The City introduced curbside composting service for food waste in 2022 in response to the requirements of SB 1383, collecting a total of 408 tons of organic waste in the first year. Approximately 10,500 homes are participating, along with 13 multifamily housing units and 184 businesses.
- **Fleet Electrification and EV Charging Master Plan:** In 2023, the City completed the Fleet Electrification and EV Charging Master Plan. The study found that out of 164 vehicles currently in the City's operational fleet, 147 could potentially be transitioned to a battery-electric or plug-in hybrid vehicle.

Figure 15 shows the remaining GHG emissions to be reduced once the existing and planned actions are implemented.

Figure 15: Laguna Beach GHG Emissions Reduction Targets Compared to GHG Emissions from Existing Efforts ($MTCO_2e$)



New Community-wide Climate Action and Adaptation Strategies

Even with existing State and local actions in place to reduce GHG emissions in Laguna Beach, the community still falls short of its ambitious targets. This CAAP presents a set of 22 climate action strategies to reduce GHG emissions and help meet adaptation and resilience goals.

This section presents an overview of the 16 GHG emission reduction strategies and six adaptation strategies, provides detailed information about the top six priority strategies, and includes the remaining GHG reduction and climate adaptation strategies. **Appendix C** provides supporting quantification and details for all strategies.

The strategies are accompanied by a list of recommended actions that were selected through conversations with City staff, the CAAP working group, and community members. The list of recommended actions represents suggested means of achieving the strategies they support but are not meant to provide a prescriptive path to implementation. Not all the listed actions for the GHG emission reduction strategies may be necessary to reach the City's identified GHG reduction targets. Due to ongoing changes in technology, regulations, and the emergence of

new best practices and funding opportunities, this approach enables the City to adapt to and leverage new opportunities or partnerships without being constrained by a specific implementation pathway.

Adaptation Strategies Overview

While reducing GHG emissions at a local, state, and national level will help mitigate the effects of climate change, some impacts are inevitable and are already apparent in Laguna Beach. For this reason, the CAAP also includes adaptation strategies to help Laguna Beach prepare for and respond to natural hazards exacerbated by climate change.

The adaptation strategies respond to the key vulnerabilities identified by the Vulnerability Assessment; concerns about current and future conditions raised by community members and City officials; and best practices in the region and across California to help promote a more unified climate adaptation response. While these climate adaptation strategies do not directly result in measurable GHG emissions reductions, they do support the GHG emissions reduction strategies and contribute to a comprehensive climate change response. As with the GHG emissions reduction strategies, the adaptation strategies support community benefits, that is, benefits that the strategy provides to communities beyond increased resilience.

The CAAP includes six adaptation strategies organized into two categories:

 Vulnerable and at-risk communities	• **A-1. Enhance community resilience to wildfire risks through proactive mitigation and community preparedness.** • A-2. Increase resilience for residents and persons with disabilities. • A-3. Ensure a resilient and thriving artist community. • A-4 Increase resilience and adaptation for residents.
 Natural and built environment	• A-5. Ensure essential services can plan for and adapt to climate change. • A-6. Plan for the long-term resilience of open space recreation and developed areas.

Of the six adaptation strategies, the strategy and applicable implementation actions related to wildfire mitigation has been identified as a **priority strategy** given the high level of wildfire risk in the community and the associated vulnerabilities.

Climate change adaptation priority strategy:

- Enhance community resilience to wildfire risks through proactive mitigation and community preparedness.

GHG Emissions Reduction Strategies Overview

There are 16 strategies that produce measurable GHG emissions reductions from community-wide activities and government operations. The 16 GHG emission reduction strategies are organized into 7 categories:

 Transportation	• **R-7. Facilitate the private-sector adoption of zero-emission vehicles.** • R-8. Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips. • R-9. Partner with employers to promote sustainable transportation alternatives for commute trips. • R-10. Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips within the City. • R-11. Enhance the City's built environment and road infrastructure to support VMT reduction goals. • **R-12. Accelerate the public-sector transition to zero-emission vehicles.**
 Energy	• **R-13. Increase residential energy efficiency in new and existing homes.** • **R-14. Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.** • R-15. Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities. • R-16. Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources. • **R-17. Accelerate the transition to renewable, resilient, and efficient power sources across governments.**

 Off-Road Equipment	• R-18. Accelerate the electrification of landscaping, construction, and other outdoor equipment.
 Solid Waste	• R-19. Reduce the amount of solid waste sent to landfills.
 Water	• R-20. Reduce potable water use in buildings and urban landscapes.
 Wastewater	• R-21. Reduce GHG emissions associated with wastewater processing.
 Open Space	• R-22. Increase carbon sequestration on natural and urban lands.

Of the 16 GHG emission reduction strategies, five are identified as **priority strategies** as they produce the largest GHG emission reductions. City staff will work with community members to begin enacting these strategies as soon as possible.

GHG emission reduction priority strategies:

- **Facilitate the private-sector adoption of zero-emission vehicles.**
- **Increase residential energy efficiency in new and existing homes.**
- **Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.**
- **Accelerate the transition to renewable, resilient, and efficient power sources across governments.**
- **Accelerate the public-sector transition to zero-emission vehicles.**

The City is considering joining a Community Choice Aggregation (CCA) program, which is included as part of Strategy 8. This would allow the City to potentially achieve a carbon-free and more resilient supply of electricity faster than the current investor-owned utilities. As joining a CCA would affect the amount of GHG emissions produced per unit of electricity used in Laguna Beach, each GHG emission reduction strategy presents the GHG emission savings both with and without joining a CCA.* Participation in a CCA would affect the level of reductions achieved by several different GHG emission reduction strategies, so it is more transparent and accurate to present GHG emissions reduction potentials of strategies with and without a CCA.

Table 6 shows the GHG reduction benefits from these strategies.

Table 6: GHG Reduction Strategies

GHG Reduction Strategy	Reductions Without CCA		Reductions With CCA	
	2030 $MTCO_2e$	2045 $MTCO_2e$	2030 $MTCO_2e$	2045 $MTCO_2e$
Reduction Strategy 2: Facilitate the private-sector adoption of zero-emission vehicles.	-8,980	-57,220	-9,610	-57,220
Reduction Strategy 3: Increase residential energy efficiency in new and existing homes.	-7,530	-11,260	-6,970	-11,260
Reduction Strategy 4: Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.	-2,980	-12,170	-3,040	-12,170
Reduction Strategy 5: Accelerate the electrification of landscaping, construction, and other outdoor equipment.	-1,470	-7,140	-1,620	-7,140

* The CCA quantification assumes that the City either establishes a new CCA program by itself or in partnership with other agencies, or that the City joins an existing CCA program other than the Orange County Power Authority. The quantification does not assume that Laguna Beach joins the Orange County Power Authority.

GHG Reduction Strategy	Reductions Without CCA		Reductions With CCA	
	2030 $MTCO_2e$	2045 $MTCO_2e$	2030 $MTCO_2e$	2045 $MTCO_2e$
Reduction Strategy 6: Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities.	-4,090	-4,010	-3,620	-4,010
Reduction Strategy 7: Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources.	-1,090	-2,880	-1,120	-2,880
Reduction Strategy 8: Accelerate the transition to renewable, resilient, and efficient power sources across governments.	-5,740	0	-9,930	0
Reduction Strategy 9: Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips.	-120	-200	-120	-200
Reduction Strategy 10: Partner with employers to promote sustainable transportation alternatives for commute trips.	-260	-450	-260	-450
Reduction Strategy 11: Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips within the City.	-70	-60	-70	-60
Reduction Strategy 12: Enhance the City's built environment and road infrastructure to support VMT reduction goals.	-70	-120	-70	-120
Reduction Strategy 13: Accelerate the public-sector transition to zero-emission vehicles.	-130	-1,140	-130	-1,140
Reduction Strategy 14: Reduce the amount of solid waste sent to landfills.	-40	-80	-40	-80
Reduction Strategy 15: Reduce potable water use in buildings and urban landscapes.	-300	-80	-300	-80
Reduction Strategy 16: Reduce GHG emissions associated with wastewater processing.	-40	Less than -10	-40	Less than -10
Reduction Strategy 17: Increase carbon sequestration on natural and urban lands.	-160	-270	-160	-270

Priority Climate Action and Adaptation Strategies

The strategies with the greatest GHG emission reduction potential and resilience benefit to the community are identified as priority strategies. Given limited City resources and the urgency of climate action and adaptation in Laguna Beach, the City will focus on implementing these strategies immediately. Each priority strategy presented in this CAAP includes a description of the strategy, the 2030 and 2045 GHG emissions reductions anticipated from the strategy at the projected performance level (if it is a GHG emissions reduction strategy), the recommended actions necessary to implement it, and community benefits. The recommended actions represent the City's current understanding of best practices in achieving GHG emissions reductions or increasing adaptive capacity and community equity, availability of technology, and local regulations as well as the current State and federal regulatory environment. The actions are meant to guide City staff and community partners in implementing these strategies, but the City should embrace new GHG emission reduction and adaptation opportunities not listed here as they become available.

Each strategy includes community benefits, which are additional advantages of the strategy to the community beyond GHG emissions reduction or climate change adaptation. The CAAP highlights 16 community benefits that a strategy can provide, although strategies may provide additional benefits beyond those identified here.

The 16 community benefits are:


Conserves Government Finances


Conserves Resources


Enhances Community Well-Being


Enhances Equity


Enhances Public Safety


Improves Ecosystem Health


Improves Energy Resilience


Improves Mobility


Improves Public Health


Promotes Sustainable Tourism


Protects Community Character


Reduces Air Pollution


Reduces Cost of Living


Reduces Ocean Pollution


Supports Local Arts


Supports Local Economy

GHG Emissions Target Achievement

With implementation of the proposed GHG emission reduction strategies in this CAAP, including the priority strategies and the other CAAP strategies, Laguna Beach will achieve long-term GHG reduction goals. The strategies result in GHG emission reductions by approximately 41 percent below estimated 1990 levels by 2030 (with participation in a CCA program), and 90 percent below 1990 levels by 2045. **Table 7** shows the projected results of the GHG emission reduction strategies and the comparison to the State's targets.

Table 7: GHG Emissions from Reduction Strategies Compared to Targets

	Without CCA		With CCA	
	2030 $MTCO_2e$	2045 $MTCO_2e$	2030 $MTCO_2e$	2045 $MTCO_2e$
1990 emissions (estimate)	215,260	215,260	215,260	215,260
Emissions without CAAP	163,280	124,390	163,280	124,390
Emissions with CAAP	130,680	22,030	126,590	22,030
Target	129,160	32,290	129,160	32,290
Target Achieved?	No	Yes	Yes	Yes
Gap to Target *	1,520	-10,260	-2,570	-10,260

* A negative value means that the GHG emissions with the CAAP go beyond the target, achieving greater reductions than is necessary to meet the target.

Achieving Carbon Neutrality

The CAAP achieves significant reductions in GHG emissions and places Laguna Beach on a path to support statewide carbon neutrality by 2045. Although GHG emissions can be eliminated from many of the City's GHG emission sources, this is not practical for every source given technical, economic, or political considerations. For the foreseeable future, achieving the City's GHG emissions-reductions goals, including carbon neutrality, will likely not be feasible without the use of local carbon sequestration, notably on natural and working lands and coastal ecosystems. Natural and working lands sequester carbon from the atmosphere through vegetation such as grasses, shrubs, and trees. Oceans and their associated ecosystems, including sea grass meadows, salt marshes, wetlands, and mangrove forests, are also a form of carbon sink and therefore sequester carbon from the atmosphere.

Currently, there is insufficient guidance and certainty around local carbon sequestration, storage, and potential carbon offset strategies to mathematically demonstrate with certainty that the CAAP strategies will achieve carbon neutrality by 2045. However, such guidance and certainty will likely emerge in future years as the City, regional agencies, and the State further explore the opportunities, develop guidance and methods, and validate new technology. When available, guidance on quantifying how to achieve carbon neutrality will be integrated into future updates of this CAAP.

Blue Carbon

Ocean ecosystems are powerful carbon sinks, sometimes known as "blue carbon."* Ocean ecosystems also help communities adapt to changing climate conditions as they can reduce coastal erosion, protect coastal resources from storm surges, and increase biodiversity. Coastal ecosystems such as tidal and salt marshes and seagrasses, are highly productive coastal ecosystems that are particularly important for their capacity to store carbon within the plants and sediments. They are therefore considered a key component of nature-based solutions to climate change. According to the National Oceanic and Atmospheric Administration, seagrass meadows account for just 0.1 percent of the world's seafloor, but store 11 percent of the organic carbon buried in the ocean. These ecosystems are found offshore from Laguna Beach and surrounding communities and could play a role in helping Laguna Beach achieve carbon neutrality.

Strategy 1: Enhance community resilience to wildfire risks through proactive mitigation and community preparedness.

Community Benefits

- Enhances Equity
- Enhances Public Safety
- Improves Ecosystem Health
- Improves Public Health
- Protects Community Character
- Reduces Air Pollution
- Reduces Ocean Pollution
- Supports Local Economy

Description

This strategy targets several natural hazards that pose a risk to Laguna Beach and its priority vulnerabilities. The CAAP prioritizes the actions related specifically to wildfire given its potential impact on a large number of priority vulnerabilities and due to input from the community that wildfire is a main concern. Laguna Beach witnessed the damage that wildfire can have on the community in 1993 and have since put several policies and programs into action to increase resilience to wildfire (see **Chapter 1**). Wildfire can directly damage infrastructure, natural ecosystems, and homes, but the indirect effects can also be dangerous. Fires can block emergency evacuation and cause power outages, and smoke from wildfires poses a health risk, especially to vulnerable populations like seniors, children, or people with pre-existing health conditions. Wildfire and any associated damage also threaten Laguna Beach's economy as the city relies on tourism as a main industry. For these reasons, the City is prioritizing actions that improve the community's resilience to wildfire and its associated secondary impacts.

The wildfire actions in this strategy are meant to reduce the risk of wildfire occurring and causing damage in Laguna Beach as well as improving emergency response to wildfires. Improvements to landscapes, such as implementing defensible space, planting fire-resistant vegetation, and reducing potential wildfire fuel through vegetation management, can significantly reduce the risk of a wildfire starting or spreading. Improvements to structures and homes, known as "hardening," can reduce vulnerabilities to wildfire damage and the risk of structure fires. Partnering with utilities to continue undergrounding utility lines is also a critical action to reduce wildfire risk.

Finally, this strategy seeks to support the extensive planning that has already been done to prevent wildfire by seeking funding and resources to implement plans, such as the City's Wildfire Mitigation and Fire Safety Report.

Strategy 1 Actions

1.1 FireWise Community Certification (Municipal)

>> Support initiatives to establish certified FireWise communities to enhance fire preparedness in neighborhoods. Work with property and homeowners to comply with FireWise standards that are recognized by the National Fire Protection Association and home insurance carriers to ensure fire insurance is provided for neighborhoods in Very High Fire Hazard Severity Zones (VHFHSZ).

1.2 Underground Utilities (Policy and Municipal)

>> Continue working with utility companies to expand efforts to underground utilities, prioritizing high-capacity power lines along evacuation routes and areas with elevated fire hazard risks. Underground utilities to reduce fire risk and enhance safety during evacuations.

1.3 Promote Fire-Resistant Landscaping (Municipal and Education)

>> Collaborate with building owners and residents to construct and maintain firebreaks, fire-resistant landscaping, and other fire resistance improvements around properties. These measures reduce fire risk and enhance property safety.

1.4 Funding for Wildfire Mitigation (Municipal)

>> Prioritize funding and resources to implement the recommendations in the City's Wildfire Mitigation and Fire Safety Report. This ensures that the City can effectively address and mitigate wildfire risks.

1.5 Fuel Modification Zones (Municipal)

>> Continue and expand the City's Fuel Modification Zone program to manage vegetation and reduce fire fuel loads in high-risk areas.

1.6 Explore AI-Based Wildfire Technology (Municipal)

>> Examine the feasibility of implementing Artificial Intelligence (AI)-based wildfire detection technologies, such as FireScout, to better prepare the community during wildfires. AI allows the early identification of wildfires and can alert emergency personnel as the fire begins. Early identification prevents environmental degradation and reduces the release of GHG emissions associated with wildfires.

1.7 Home Hardening for Fire Safety (Education)

>> **Promote the retrofitting of existing structures to reduce vulnerabilities from wildfires and structural fires during wildfire events, increase awareness on home hardening, and explore grant funding for fire safety retrofits.**

1.8 Fire Adaptation Resources (Education)

>> **Share fire adaptation resources via the Fire Adapted Communities Learning Network. This network provides valuable information and strategies to improve community resilience to wildfires.**

Strategy 2: Facilitate the private-sector adoption of zero-emission vehicles.

GHG Reductions

With CCA

2030: 9,610 $MTCO_2e$

2045: 57,220 $MTCO_2e$

Without CCA

2030: 8,980 $MTCO_2e$

2045: 57,220 $MTCO_2e$

Community Benefits

- Enhances Community Well-Being
- Enhances Equity
- Improves Public Health
- Reduces Air Pollution

Description

Transportation is the largest contributor to GHG emissions in Laguna Beach. Most residents in Laguna Beach (87 percent) commute alone in a personal vehicle traveling outside the city for work. There are currently limited transportation options from the city to surrounding work centers in the area and local transit service is seasonal with increased service in the summer months to support the increase in visitors. It is likely that residents will continue to rely heavily on personal vehicles for travel in the region and so encouraging the transition from gasoline- and diesel-powered vehicles to electric or other zero-emission vehicles can have a significant impact on GHG emissions in Laguna Beach.

As noted in **Chapter 2**, the State has regulations in place to require a greater proportion of electric and clean fuel vehicles in California by 2030 and 2045. These regulations are meant to encourage car makers to innovate and produce more zero-emission vehicles. However, widespread adoption of EVs depends on an ample supply of EV chargers, both at public places and at homes. This strategy aims to support the proliferation of zero-emission vehicles by installing more EV chargers in public spaces and supporting or requiring the installation of EV chargers at businesses and homes.

Implementation of this strategy will help increase the share of zero-emission vehicles on the road and therefore reduce GHG emissions from internal combustion vehicles that run on gasoline or diesel.

This strategy also includes an action to improve public awareness of the various rebates and incentives for purchasing a zero-emission vehicle. One of the hindrances to the proliferation of zero-emission vehicles on the road is their price. Currently, many electric models of vehicles are more expensive than their gasoline-powered counterparts. While increasing the supply of EVs will help drive down cost, in the meantime there are various rebates and incentives that individuals can take advantage of to make purchasing an EV more feasible.

Strategy 2 Actions

2.1 Expand Public EV Charging Infrastructure (Municipal)

>> Install more publicly available EV charging ports at City facilities, including DC Fast Chargers. Consider key locations, such as public parking lots, parks, recreation facilities, and City offices, including the Glenneyre Structure, metered parking on Cliff Drive, and additional stations at Laguna Beach City Hall. Regularly maintain chargers and monitor usage rates to ensure appropriate distribution throughout the city. This expansion supports the growing demand for EV charging and encourages the adoption of EVs by providing accessible charging options.

2.2 Study Amendments to CALGreen (Municipal)

>> Investigate amendments to CALGreen that would require new construction to exceed minimum State mandates for the number and types of EV charging infrastructure. Enhancing CALGreen standards would ensure that new developments are better equipped to meet future EV charging needs and support the transition to electric.

2.3 Information Website for Incentives and Programs (Education)

>> Create a website that hosts information on incentives and programs available for EVs, e-bikes, and scooters. Promote this information through events, social media, and community groups, helping residents access available resources.

Strategy 3: Increase residential energy efficiency in new and existing homes.

GHG Reductions

With CCA

2030: 6,790 $MTCO_2e$

2045: 11,260 $MTCO_2e$

Without CCA

2030: 7,530 $MTCO_2e$

2045: 11,260 $MTCO_2e$

Community Benefits

- Conserves Resources
- Enhances Community Well-being
- Enhances Equity
- Improves Energy Resilience
- Reduces Air Pollution

Description

Energy use in residential buildings is the second-largest contributor of GHG emissions for Laguna Beach and makes up approximately a quarter of all community-wide emissions. These emissions are caused by electricity and natural gas used in buildings for lighting, appliances, heating, and cooling. Replacing natural gas appliances with electric models and making improvements to the building envelope through weatherization retrofits can significantly reduce the GHG emissions produced by a household. Over 75 percent of homes in Laguna Beach were built before the advent of modern building codes around 1980 and therefore could benefit from energy-efficiency retrofits.

This strategy aims to improve energy efficiency in both new and existing residential buildings. The actions in this strategy include improving insulation for efficiency and comfort, encouraging upgraded major appliances, mandatory energy audits during significant home renovations to identify improvement areas, and promoting green building standards such as CALGreen and LEED certifications. Similar to EVs, there are many rebates, incentives, and even free retrofit programs available to homeowners through electric utility companies and third-party organizations. This strategy also supports targeted outreach to vulnerable households, including Laguna Beach's large senior population and artist community, and property owners to make them aware of these energy- and money-saving resources.

Strategy 3 Actions

3.1 Mandatory Energy-Efficiency Audits (Policy)

>> Require a whole-building energy-efficiency audit to be completed during major structural renovations or expansions. This policy ensures that energy-efficiency improvements are identified and implemented during significant building projects.

3.2 Promote Green Building Standards (Education)

>> Encourage the adoption of CALGreen Tier 1 and Tier 2 green building ratings, including Passive House, LEED, Build It Green, Energy Star certifications, and solar requirements per Title 24, for all new developments and renovations. Use preapproval consultations and educational initiatives to promote these standards.

3.3 Outreach to Vulnerable Households (Education)

>> Prioritize direct outreach to residents of older, less energy-efficient homes, low-income households, and households with seniors to promote energy-efficiency improvements. This targeted outreach aims to support those in most need of energy-saving measures.

3.4 Increase Awareness of Tax Credits, Benefits, Utility Programs, and Rebates (Education)

>> Expand property owners' awareness of and access to State and federal tax credits and benefits, including those from the Inflation Reduction Act. Publicize energy-efficiency improvement programs and rebates offered by SoCalGas, SDG&E, and SCE. Educating property owners on available financial incentives will encourage more energy-efficient upgrades.

Strategy 4: Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.

GHG Reductions

With CCA

2030: 3,040 $MTCO_2e$

2045: 12,170 $MTCO_2e$

Without CCA

2030: 2,980 $MTCO_2e$

2045: 12,170 $MTCO_2e$

Community Benefits

- Conserves Resources
- Enhances Community Well-being
- Improves Energy Resilience
- Improves Public Health
- Reduces Air Pollution

Description

In addition to increasing energy efficiency in homes to reduce community-wide GHG emissions, Laguna Beach community members have the choice to replace natural-gas powered appliances, like water and space heaters, with electric-powered options. This voluntary action not only reduces GHG emissions but improves indoor air quality by eliminating the harmful toxins that are released into the air by burning natural gas. While California already has "green building" standards in place through the sections of the Building Code, like Title 24, cities can encourage the adoption of electric appliances and increased energy efficiency through educational efforts and heightened building standards as appropriate. Higher standards help ensure that new and updated buildings are equipped with energy-saving technologies.

This strategy aims to reduce energy use in residential buildings through the establishment of a reach code that would encourage the adoption of electric appliances, and through increased awareness of the benefits of an energy-efficient home, such as improved indoor air quality and lower utility bills. This strategy also aims to educate residents of the various programs available to support adoption of these appliances, including rebates and other financial incentives.

South Coast Air Quality Management District Proposed Amended Rules 1111 and 1121

The South Coast Air Quality Management District (AQMD), which regulates air pollution in Orange County, is considering a set of rules that would phase out space and water heaters in homes and small businesses that produce air pollutants known as nitrogen oxides (NO_x). These proposed regulations would require sellers and installers to replace old units that produce NO_x with zero-emitting units when the old units reach their end of life. Since devices that emit NO_x burn natural gas and zero-emitting units run off electricity, this regulation (if adopted) would reduce natural gas use and the resulting GHG emissions in Laguna Beach. South Coast AQMD intends to consider these regulations in the second half of 2024.

Strategy 4 Actions

4.1 Develop a Residential Reach Code (Policy)

>> Create a reach code that surpasses the California Building Standards Code, mandating high energy performance for new construction and remodels. Reach codes are advanced building codes that require higher energy efficiency and performance than State standards, supporting local climate action and GHG reduction goals.

4.2 Develop Incentives (Policy)

>> Identify and offer development incentives and streamlined permitting processes for new development projects. This approach can facilitate the adoption of energy-efficient building practices by reducing administrative barriers and costs for developers.

4.3 Zero-Emissions Program Awareness (Education)

>> Collaborate with community partners to educate residents, business owners, and developers about the zero-emissions water and space heater program, ensuring that the Laguna Beach community is aware of the program and available incentives, thereby supporting the transition to zero-emission appliances and contributing to improved air quality and reduced GHG emissions.

4.4 Community Tours of Green Buildings (Education)

>> Conduct community tours of all-electric and other innovative green buildings to showcase sustainable building practices and technologies.

4.5 Raise Awareness of Indoor Air Quality (Education)

>> Partner with Orange County Public Health Services to raise awareness about the relationship between gas appliances and indoor air quality. Educate the community on how to improve indoor air quality by transitioning to electric appliances.

4.6 Informative Website for Incentives and Programs (Education)

>> Create a website that hosts information on electrification and programs available for weatherization. Promote this information through events, social media, and community groups, helping residents access available resources.

Strategy 8: Accelerate the transition to renewable, resilient, and efficient power sources across governments.

GHG Reductions

With CCA

2030: 9,930 $MTCO_2e$

2045: 0 $MTCO_2e$

Without CCA

2030: 5,740 $MTCO_2e$

2045: 0 $MTCO_2e$

Community Benefits

- Conserves Resources
- Enhances Community Well-being
- Enhances Public Safety
- Improves Energy Resilience
- Improves Public Health
- Promotes sustainable tourism
- Reduces Air Pollution
- Reduces cost of living

Description

Even if all the homes and businesses in Laguna Beach transition to electric appliances, if the electricity used by the community is not from a renewable source, the City will struggle to reach its GHG emission reduction targets. As cities "electrify," it is critical that power is sourced from solar, wind, or other non-fossil fuel-based sources. This strategy supports a transition to renewable sources of power sooner than State actions, which mandate a 100 percent renewable power source by 2045. This strategy also supports the development of energy independence and resilience through the establishment of microgrids and personal solar and battery-storage systems.

Strategy 8 Actions

8.1 Explore Community Choice Aggregation (CCA) Programs (Municipal/Education)

>> Investigate options to join or establish a CCA program. Promote community participation in 100 percent renewable energy tiers for any program that the City establishes or joins. CCAs allow communities to procure power from alternative suppliers while still receiving transmission and distribution service from their existing utility.

8.2 Implement Microgrid Resiliency Infrastructure (Municipal)

>> Follow the recommendations from the City's Microgrid Resiliency Assessment to install solar photovoltaic systems and battery energy storage systems on key City facilities. This will enhance the resilience of the City's energy infrastructure.

8.3 Install Solar Photovoltaic Shade Structures (Municipal/Policy)

>> Install solar photovoltaic (PV) systems as shade structures at City-owned parking lots, recreational facilities, and businesses. This dual-purpose approach provides renewable energy while offering shaded parking and recreational areas.

8.4 Create Interagency Partnership Council (Municipal/Education)

>> Explore the formation of an interagency partnership council with the school district, Laguna Beach County Water District, South Coast Water District, and the City. This committee could identify and pursue partnership opportunities for renewable energy projects throughout the city.

8.5 Promote Solar PV and Battery Systems (Education)

>> Utilize the City's website, newsletters, e-blasts, magazines, and public events to promote the benefits of solar PV and battery systems at all residential and nonresidential facilities. Provide resources to help residents and business owners find local solar panel installers and share information about available solar rebates and incentives.

Strategy 13: Accelerate the public-sector transition to zero-emission vehicles.

GHG Reductions

With CCA

2030: 240 $MTCO_2e$

2045: 1,140 $MTCO_2e$

Without CCA

2030: 130 $MTCO_2e$

2045: 1,140 $MTCO_2e$

Community Benefits

- Conserves Resources
- Improves Mobility
- Improves Public Health
- Reduces Air Pollution
- Supports local economy

Description

Vehicles owned by the City that are critical for local government operations, including local trolleys, are a major source of GHG emissions from local government operations. This strategy aims to transition City-owned vehicles to zero-emission models. This requires procurement of zero-emission vehicles and installation of EV chargers.

Strategy 13 Actions

13.1 Procure Zero-Emission Vehicles, Trolleys, and Buses (Municipal)

>> Develop a procurement process to select vendors that provide zero-emission vehicles and buses as recommended by the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This involves identifying reliable suppliers and evaluating vehicle options to ensure they meet the City's sustainability and operational requirements, especially for vehicles operated by public safety agencies.

13.2 Evaluate Fleet and Replacement Cycles (Municipal)

>> Assess the current condition of the City's vehicle fleet and establish replacement cycles that align with financial constraints. This evaluation will help prioritize which vehicles to replace first and plan for a systematic transition to a zero-emissions fleet.

13.3 Install Charging Infrastructure (Municipal)

>> Install EV charging infrastructure at the City's consolidated maintenance facility consistent with the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This will ensure that the City has the necessary infrastructure to support the charging needs of a growing fleet of EVs.

13.4 Workforce Training (Education)

>> Provide training for mechanics and fleet operators to ensure they can effectively operate and maintain zero-emission vehicles. This training will be crucial for the smooth integration of new technologies into the City's fleet operations.

Additional GHG Emission Reduction and Adaptation Strategies and Actions

While not deemed priority strategies, the additional strategies in the CAAP are still critical in helping the City achieve its GHG emission reduction and resilience goals. Without these additional strategies, Laguna Beach will not achieve its 2030 and 2045 GHG emission reduction targets and will not increase its adaptative capacity to priority hazards, such as sea level rise, flooding, groundwater emergence, and extreme heat. However, the implementation of these strategies will likely begin in the near- or medium-term as more resources become available.

Energy

Goal: Buildings across Laguna Beach transition to using renewable and zero-carbon energy sources.

Strategy 5: Accelerate the electrification of landscaping, construction, and other outdoor equipment.

Off-road equipment refers to equipment used for landscaping, construction, or other industrial uses that often run on gasoline or diesel. New State regulations went into effect at the beginning of 2024 that banned the sale of some new gasoline and diesel equipment, including lawn mowers, leaf blowers, hedge trimmers, string trimmers, and some types of generators and power washers. The City can complement this regulation with local strategies to support the electrification of off-road equipment, especially landscaping equipment.

This strategy centers on transitioning to zero-emission equipment. The City can electrify its own landscaping equipment to reduce emissions from gas and diesel-powered equipment and to encourage community participation. This strategy also aims to promote the benefits of zero-emission landscaping equipment for residents and businesses beyond their GHG emission-reducing potential, including reduced noise, and long-term cost savings. Partnerships with organizations like the South Coast Air Quality Management District further support this transition by offering rebate and exchange programs, making it easier and more affordable for the community to adopt eco-friendly landscaping solutions.

Strategy 5 Actions

5.1 Electrify City-Owned Landscaping Equipment (Municipal)

>> Transition City-owned landscaping and other off-road equipment to electric models. This change reduces emissions from gas and diesel-powered equipment, contributing to cleaner air and a reduction in the City's carbon footprint.

5.2 Encourage Zero-Emission Landscaping Equipment (Education)

>> Promote the replacement of gas and diesel-powered landscaping equipment with zero-emission models among residents and businesses. This encouragement can include providing information on the benefits of electric equipment, such as reduced noise and emissions, and potential cost savings over time.

5.3 Promote Rebate and Exchange Programs (Education)

>> Partner with the South Coast Air Quality Management District to promote programs like the Residential Electric Lawn Mower Rebate Program and the Commercial Electric Lawn & Garden Equipment Exchange Program. These programs offer financial incentives for residents and businesses to switch to electric landscaping equipment, making the transition more affordable and appealing.

Strategy 6: Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities.

Similar to Strategy 1's efforts to reduce GHG emissions in residential buildings, this strategy aims to reduce nonrenewable energy use in nonresidential buildings through the proliferation of energy-efficient and electric appliances to replace natural gas appliances as well as improvements to the building envelope through weatherization retrofits. GHG emissions from nonresidential buildings is the third-highest source of community-wide emissions in Laguna Beach. This category includes stores, offices, and hotels. Building and facility energy use is the largest source of GHG emissions for local government operations. This strategy also aims to enforce stricter energy efficiency and electrification standards for new nonresidential buildings.

Tourism is the largest industry in the city, and the 6 million people who visit Laguna Beach annually play a significant role in supporting the local economy. Visitors to Laguna Beach can also do their part to reduce the city's GHG emissions. This strategy includes collaboration with the local tourism bureau, Visit Laguna Beach, to revise the Short-Term Lodging Ordinance to require energy-efficiency audits as a condition for application approval. This will ensure that any new developments to support tourism are low to zero- emission. Beyond the building itself, this strategy aims to increase participation in the Green Business Program, which encourages more environmentally sustainable business practices, such as using compostable food service materials.

This strategy also supports local and regional partnerships with the Laguna Beach Business Club, Chamber of Commerce, and the County to ensure comprehensive energy-efficiency upgrades and actions.

Strategy 6 Actions

6.1 Cal Green Tier 1 Compliance (Municipal)

>> **Pursue Cal Green Tier 1 compliance for all new City buildings where feasible. This policy ensures that new City construction meets high energy performance standards, contributing to sustainability and energy efficiency.**

6.2 Energy Audits for City Buildings (Policy)

>> **Conduct energy audits of existing City buildings and facilities to identify opportunities for energy conservation and efficiency upgrades or retrofits. These audits will help pinpoint areas where the City can improve energy efficiency and reduce operational costs.**

6.3 Short-Term Lodging Ordinance Update (Policy)

>> Modify the City's Short-Term Lodging Ordinance to require the completion of an energy-efficiency audit as a condition for application approval. This update will ensure that short-term lodging facilities operate efficiently and contribute to the City's overall energy conservation goals.

6.4 Increase Participation in Green Initiatives (Municipal/Education)

>> Improve the City's Green Business Program and enhance community awareness and participation. By promoting this program, the City encourages local businesses to adopt sustainable practices and improve their environmental impact.

6.5 Hospitality Industry Partnerships (Education)

>> Work with the hospitality industry to promote sustainable practices within the hospitality sector and enhance the industry's overall environmental impact.

- Encourage energy-efficient property renovations.
- Promote CALGreen Tier 1 Compliance.
- Provide educational information on energy conservation to guests.
- Increase participation in sustainable tourism certification programs like those from the Global Sustainable Tourism Council. This collaboration aims to promote sustainable practices in the hospitality sector and enhance the industry's overall environmental impact.

6.6 Promote Energy Efficiency for Businesses (Education)

>> Collaborate with the Laguna Beach Business Club and Laguna Beach Chamber of Commerce to raise awareness of energy-efficiency opportunities and benefits for local businesses. This initiative aims to educate businesses on how to reduce energy consumption and costs while contributing to environmental sustainability.

6.7 Coordinate Regional GHG Reduction Efforts (Municipal)

>> Implement the CAAP in coordination with other Orange County jurisdictions to create a consistent regional approach to GHG reduction and climate adaptation as outlined in the PCAP. Participate in regional initiatives to promote and incentivize GHG reduction efforts.

Strategy 7: Construct new and retrofit existing, nonresidential buildings to use zero-carbon energy sources.

Nonresidential buildings, including stores, restaurants, hotels, and municipal buildings, are significant contributors to GHG emissions due to their reliance on natural gas-powered appliances for heating, cooling, cooking, or back-up power. By transitioning to zero-carbon energy sources, such as solar power and electric alternatives for appliances, this strategy aims to significantly reduce emissions associated with energy use in commercial and municipal buildings. Supporting actions include developing enhanced building standards to reduce reliance on fossil fuels, prioritizing carbon-free energy in new municipal projects, and mandating the replacement of fossil fuel appliances with zero-emission options in the private sector.

Strategy 7 Actions

7.1 Develop a commercial Reach Code (Municipal)

>> **Create a reach code that surpasses the California Building Standards Code, mandating high energy performance for new construction and remodels of City facilities. Reach codes support local climate action and GHG reduction goals.**

7.2 Transition to Carbon-Free Energy in Municipal Buildings (Municipal)

>> **Initiate the shift of municipal buildings and facilities to carbon-free energy sources focusing first on those with outdated fossil fuel appliances and infrastructure. Prioritize buildings equipped with solar photovoltaic and battery energy storage systems.**

7.3 Carbon-Free Energy for New City Buildings (Municipal)

>> **Where feasible, ensure that new City buildings are powered by carbon-free energy sources, supporting the City's commitment to sustainability and reducing GHG emissions.**

7.4 Replace Business Appliances with Zero-Emission Options (Policy)

>> **In accordance with regulations from the South Coast Air Quality Management District and the California Air Resources Board, mandate the replacement of water heaters and space heaters in businesses with zero-emission appliances at the end of their life cycles.**

7.5 Share Green Building Practices (Education)

>> **Work with the Orange County chapter of the U.S. Green Building Council to disseminate information on green building opportunities and best practices to the Laguna Beach development community. This collaboration aims to foster the adoption of sustainable building practices in local developments.**

7.6 Highlight Sustainable Hospitality Practices (Education)

>> **Work with Visit Laguna Beach to promote hotels and other hospitality businesses that commit to sustainable practices, in coordination with the Green Business Certification Program. This will encourage more businesses to adopt environmentally friendly practices and attract eco-conscious tourists.**

Transportation

Goal: Community members and visitors reduce their dependence on personal and single-occupancy vehicles.

Strategy 9: Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips.

Encouraging the use of public transit or active modes of transportation, including walking and biking, to replace personal vehicle trips around town can reduce GHG emissions from the transportation sector. This strategy supports the expansion of local transit services, including the Laguna Beach Trolley and Laguna Beach Local Neighborhood On-Demand Transit. It also requires new developments to accommodate other transportation modes beyond personal, gasoline-powered vehicles.

Strategy 9 Actions

9.1 Support Multiple Transportation Modes (Policy)

>> Require new developments, and existing nonresidential development upon change in ownership to accommodate various transportation modes. This includes installing EV charging stations, end-of-trip bike facilities, and bike parking. These measures promote sustainable transportation options.

9.2 Enhance Neighborhood Transit Services (Municipal)

>> Continue to evaluate the effectiveness of existing neighborhood transit services and work to expand the coverage and hours of the Laguna Beach Local Neighborhood On-Demand Transit service. This includes extending service to the Canyon area and expanding service hours earlier and later in the day, improving accessibility and convenience for residents.

9.3 Promote Public Transit (Education)

>> Expand promotion and marketing efforts for the Laguna Beach Trolley and Laguna Beach local services. Focus on attracting more resident trips by highlighting the

convenience, environmental benefits, and cost savings of using these public transit options. Increased use of public transit can reduce traffic congestion and lower emissions in the community.

Strategy 10: Partner with employers to promote sustainable transportation alternatives for commute trips.

Many local workers commute into Laguna Beach from other cities in the region, contributing to Laguna Beach's local GHG emissions. This strategy aims to improve regional connectivity through collaboration with regional transit providers and local employers.

Strategy 10 Actions

10.1 Expand Use of Transportation Demand Management Programs (Municipal/ Education)

>> **Work with local businesses to connect them with the Orange County Transportation Authority (OCTA) to expand vanpool services for regional commuters to and from Laguna Beach. Help businesses identify economic incentives for these services. Regular collaboration with large employers (e.g., hotels, Mission Hospital, Laguna Beach Unified School District) will help facilitate vanpool sign-ups and promote the program.**

10.2 Promote Connectivity with Laguna Beach Transit Services (Educational)

>> **Promote the connectivity between OCTA, Laguna Beach transit services, and other coastal city transit services to reduce barriers to using public transit. Improved integration and coordination will make it easier for residents and visitors to use transit options.**

Strategy 11: Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips in the city.

Even if residents, businesses, and municipal services reduce their GHG emission impacts, the approximately 6 million visitors to Laguna Beach each year bring in an influx of traffic and associated emissions. This strategy addresses both congestion in popular tourist areas and GHG emissions from visitor vehicles through an expanded bike path network and improved parking options near commercial areas.

Strategy 11 Actions

11.1 Develop Aggregated Parking Sites (Municipal)

>> **Create parking structures adjacent to transit stops or in/near commercial areas to provide easy parking access and promote non-vehicle transportation throughout the city. This initiative aims to reduce traffic congestion and encourage the use of public transit and other alternative transportation modes.**

11.2 Develop an Integrated Bicycle Network (Municipal)

>> **Develop an integrated bicycle network to connect bike paths in Laguna Beach with other nearby cities, such as Irvine and Newport Beach. A bicycle network will encourage the use of alternative transportation and reduce GHG emissions from vehicles.**

Strategy 12: Enhance the City's built environment and road infrastructure to support VMT reduction goals.

Laguna Beach's topography presents a unique challenge to transitioning personal vehicle travel to active modes of transportation, mainly walking and biking. This strategy supports implementing complete streets to ensure safe routes for walking and biking throughout the community.

Strategy 12 Actions

12.1 Implement Mobility and Complete Streets Plan (Municipal)

>> **Revise the City's Enhanced Mobility and Complete Streets Transition Plan to integrate new findings and implement the Transition Plan. This update will guide the development of Capital Improvement Projects and set new City design standards, ensuring that future infrastructure projects align with current best practices in mobility and complete streets design as well as facilitating simultaneous large-scale evacuation and entry of emergency apparatus at scale in the event of major wildfire or other disaster incidents.**

12.2 Improve Sidewalk Network (Municipal)

>> **Identify and address gaps in Laguna Beach's sidewalk network where sidewalks are missing or severely damaged. Focus on installing and repairing sidewalks and other pedestrian connections to ensure a continuous and safe pedestrian infrastructure. This initiative aims to promote walkability and enhance pedestrian safety throughout the city.**

Solid Waste

Goal: There is little or no waste generation in Laguna Beach.

Strategy 14: Reduce the amount of solid waste sent to landfills.

Reducing waste sent to landfills directly lowers GHG emissions. The use of recycled materials indirectly lowers GHG emissions as less needs to be made and the resource-intensive process of materials production is avoided. This strategy aims to achieve zero-waste at City facilities, commercial businesses, and events while increasing the use of recycled materials wherever possible.

Strategy 14 Actions

14.1 Achieve Zero-Waste at City Facilities and Commercial Businesses (Municipal/Policy)

>> **Implement three-bin waste systems (for recyclables, organic waste, and landfill waste) at accessible locations in all City facilities. Ensure reusable items are used where food is prepared or consumed. This setup promotes proper waste segregation and reduces overall waste.**

14.2 Maximize Use of Recycled Materials (Municipal/Education)

>> **Explore ways to maximize the use of recycled materials throughout the community, including in capital improvement and private construction projects. This could involve**

using recycled content in building materials, furnishings, and other City infrastructure and private development projects.

14.3 Require Zero-Waste Events (Policy)

>> Mandate that large events permitted by the City must be zero-waste. This initiative ensures that event organizers implement waste reduction strategies, including the use of recyclable, compostable, or reusable materials, and proper waste sorting and disposal practices.

14.4 Establish Construction and Demolition Reuse Programs (Municipal/Education)

>> Connect with businesses that reuse construction and demolition materials to establish programs in Laguna Beach. Publicize the programs to increase community awareness, increase the City's diversion rate, and avoid sending materials to the landfill.

Water

Goal: Laguna Beach is a champion of water conservation.

Strategy 15: Reduce potable water use in buildings and urban landscapes.

Reducing water use reduces the GHG emissions associated with water treatment and movement, but it also improves resilience as Laguna Beach is vulnerable to drought. This strategy supports a transition to a more sustainable water supply through less water-intensive landscaping, more water-efficient appliances and fixtures, and innovative ideas like installing rainwater catchment systems on City-owned buildings.

Strategy 15 Actions:

15.1 Replace Turf with Native Landscaping (Municipal)

>> Transition turf at City-owned buildings to native, drought-tolerant, and fire-resistant landscaping options. This strategy reduces water usage and enhances fire resistance, contributing to the sustainability and safety of City properties.

15.2 Install Rainwater Catchment Systems (Municipal)

>> Identify opportunities for installing rainwater catchment systems at City-owned properties and parks. Develop a plan to implement these systems to capture and utilize rainwater, reducing reliance on potable water for irrigation and other uses.

15.3 Water Efficiency in New Development Projects and Major Renovations (Policy)

>> Mandate that new developments and major retrofit projects reduce potable water consumption by incorporating water-efficient appliances, technologies, and drought-tolerant landscaping strategies. These requirements can support long-term water conservation and resilience against drought conditions, while incorporating fuel modification zones and defensible space around structures in keeping with State "Safer from Wildfire" fire prevention standards.

15.4 Promote Rebate Programs (Education)

>> Actively promote rebate programs, tax credits, and other incentivizes offered by Southern California Edison, SoCal WaterSmart, the Municipal Water District of Orange County, California Water Wise, and similar regional, State, or federal programs. These programs provide incentives for high-efficiency appliances, turf replacement, irrigation equipment, and rain barrels and cisterns, encouraging the adoption of water conservation and efficiency measures.

15.5 Provide Training for Landscapers (Education)

>> Offer training and educational materials to local landscapers on native landscaping as well as water and soil conservation practices. This initiative ensures that landscapers are equipped with the knowledge and skills needed to implement sustainable landscaping practices.

15.6 Install Grey Water Systems at City Buildings (Municipal)

>> Where feasible, implement grey water systems at City-owned buildings with landscaping. Grey water systems reuse water from sinks, showers, and laundry for irrigation, significantly reducing the use of potable water for landscaping and promoting water conservation.

15.7 Streamline Permits for Residential Grey Water Systems (Policy)

>> Develop tools to streamline the permitting process for residents to install grey water systems in their homes. Simplifying the permit process and providing incentives will encourage more homeowners to adopt grey water systems, contributing to overall water conservation efforts in the community.

Wastewater

Goal: There is greater wastewater efficiency throughout Laguna Beach.

Strategy 16: Reduce GHG emissions associated with wastewater processing.

Reducing water use also reduces the amount of wastewater produced and the associated GHG emissions from the treatment of wastewater. Grey water systems provide secondary use for water from sinks, showers, or laundry machines, therefore reducing the need for potable water for irrigation.

Strategy 16 Actions

16.1 Install Grey Water Systems at City Buildings (Municipal)

>> **Where feasible, implement grey water systems at City-owned buildings with landscaping. Grey water systems reuse water from sinks, showers, and laundry for irrigation, significantly reducing the use of potable water for landscaping and promoting water conservation.**

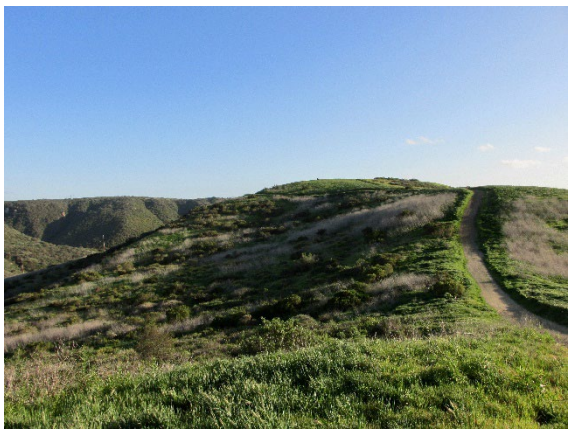
16.2 Streamline Permits for Residential Grey Water Systems (Policy)

>> **Develop tools to streamline the permitting process for residents to install grey water systems in their homes. Simplifying the permit process and providing incentives will encourage more homeowners to adopt grey water systems, contributing to overall water conservation efforts in the community.**

Open Space

Goal: Healthy and thriving natural lands and green spaces in and around Laguna Beach.

Strategy 17: Increase carbon sequestration on natural and urban lands.



Sequestering, or storing, carbon from the atmosphere into the soil is a natural process of plants. If Laguna Beach is to achieve carbon neutrality, some atmospheric carbon will need to be sequestered as reducing emissions to zero is difficult, if not impossible, with current lifestyles and technology. This strategy aims to increase the sequestration potential of Laguna Beach's land by planting more trees and other vegetation that can sequester carbon, such as grasses. It also supports improving soil health, which improves soil's ability to hold more carbon and support vegetation.

Strategy 17 Actions

17.1 Expand Urban Tree Canopy (Municipal)

>> **Increase the urban tree canopy by planting native shade trees throughout Laguna Beach, with a focus on urban heat island areas, while also maintaining fire-safe landscaping by adhering to all current and future federal, state and local defensible space requirements. Expanding the tree canopy helps reduce temperatures, improve air quality, and enhance the aesthetic appeal of urban areas. Native trees are particularly beneficial as they are adapted to the local climate and support local biodiversity and fire safety through the use of fire-resistant vegetation.**

17.2 Enhance Carbon Sequestration (Municipal)

>> **Explore methods to increase carbon sequestration on City-owned facilities and public rights-of-way. This can be achieved through increasing composting, mulching, and nutrient management practices. These activities improve soil health, promote plant**

growth, and increase the amount of carbon stored in vegetation and soil, contributing to the City's sustainability and climate resilience efforts.

17.3 Install Green Roofs on City Facilities (Municipal/Education)

>> Facilitate the installation of vegetative layers on rooftops of City facilities. Green roofs reduce the urban heat island effect, increase carbon sequestration, improve stormwater management and water quality, and reduce energy use.

17.4 Encourage Carbon Sequestration Landscapes (Education)

>> Develop a community education campaign to encourage planting and managing landscapes that increase carbon sequestration, capture rainwater, and enhance fire safety and through maintaining defensible space requirements. Include educational materials, workshops, demonstrations, and financial incentives where feasible.

Vulnerable and At-Risk Communities

Goal: Improve disaster resilience throughout our at-risk community as climate change materially increases the disaster threat level from a variety of natural and human-caused hazards throughout Laguna Beach.

Strategy 18: Increase resilience for residents and persons with disabilities.

As discussed in **Chapter 2,** Laguna Beach has several vulnerable populations who are at greater risk to the impacts of climate hazards or struggle to maintain safe and resilient homes. This strategy supports vulnerable populations through programs to retrofit homes and improve emergency response and evacuation protocols.

Strategy 18 Actions

18.1 Home Retrofit Assistance Program (Municipal)

>> Develop a program that provides physical assistance with energy-efficiency upgrades, home hardening, and defensible space maintenance for low-income seniors and persons with disabilities. This initiative will help these individuals maintain safe and energy-efficient homes, particularly in the context of disaster preparedness and climate resilience.

18.2 Contingency Plans for Transit Services (Municipal)

>> Create contingency plans to ensure the continuity of transit services for senior citizens and persons with disabilities during staffing and fuel shortages. These plans will ensure that vulnerable populations have reliable transportation even during crises.

18.3 Accessibility Audit (Municipal)

>> Conduct an accessibility audit of City-owned public spaces and facilities, public transportation paratransit systems, and City-operated digital platforms. Identify and remedy barriers for seniors and persons with disabilities to enhance accessibility in public services.

18.4 Support Community Emergency Response Efforts (Municipal)

>> Continue supporting the Community Emergency Response Team (CERT), Lifelong Laguna's Aging-in-Place, and Habitat for Humanity in performing wellness checks on seniors. Train CERT and Aging-in-Place volunteers on completing Home Modification Assessments, and engaging residents in emergency preparation and planning.

18.5 Collaborate with Senior Service Providers (Municipal)

>> Work with the Susi Q Center, senior transportation services, Age Well Senior Services, Dayle McIntosh Center South County Branch, Sally's Fund, LifeLong Laguna, and other senior service providers to ensure that the needs of seniors and people with disabilities are included in evacuation and emergency response plans.

18.6 Provide Emergency Preparedness Information (Education)

>> Disseminate information about disaster prevention (especially with respect to fire safety), emergency preparedness, and planning, at the Susi Q Center, as well as senior-focused community service groups and senior enrichment activities.

18.7 Develop Personalized Emergency/Disaster Plans for Residents (Education/Municipal)

>> Collaborate with service organizations, neighborhood associations, and senior-focused programs such as Age Well Senior Services to develop personalized sustainability, emergency, evacuation, and climate adaptation plans. These plans will address the specific needs of all residents, especially those over age 50 in emergency situations.

Strategy 19: Ensure a resilient and thriving artist community.

Artists are integral to Laguna Beach's culture. They also represent a vulnerable population as many are lower income or live in Laguna Canyon. This strategy supports the artist community through actions to bolster the resilience and energy efficiency of their homes.

Strategy 19 Actions

19.1 Support Climate-Related Improvements for Artist Housing (Municipal)

>> **Assist artists living in unpermitted residences in Laguna Canyon. This program will support the upgrading and retrofitting of their homes to withstand climate-related hazards, ensuring safety and resilience. Additionally, implement an amnesty program for these artists to address the legal and regulatory aspects of their unpermitted residences, offering a pathway to compliance and improved living conditions.**

Strategy 20: Increase resilience and adaptation for residents.

In the event of a disaster, community services are critical to help warn residents of a potential hazard, evacuate residents from harmful areas, provide safe temporary shelter, or provide medical care. This strategy improves community resilience through enhanced community services in case of an emergency.

Strategy 20 Actions

20.1 Enhance Flood and Wildfire Warning Systems (Education)

>> **Improve the dissemination of flood and wildfire warnings and emergency information, focusing on reaching those who lack internet access and cell phones, and those for whom English is a second language. Implement strategies such as multilingual alerts, community outreach programs, and traditional communication methods to ensure comprehensive emergency communication systems.**

20.2 Incentivize Clean Air and Cooling Centers (Policy)

>> **Support and incentivize owners of hotels, motels, and short-term rental properties to upgrade their facilities to serve as clean air and cooling centers for visitors. Ensure these facilities have sufficient backup power supplies to provide safe and comfortable environments during extreme weather events.**

20.3 Accommodate Displaced Individuals (Municipal)

>> **Collaborate with hotels, motels, and short-term rental property owners to make unused rooms available to residents temporarily displaced by wildfires or other major disaster incidents to provide temporary, short-term shelter for local disaster victims.**

20.4 Collaborate on Medical Services Deployment (Municipal)

>> **Work with Orange County Health Care Agency, the Emergency Medical Volunteer Group, Providence Mission Hospital, and Laguna Beach Community Clinic to ensure the timely and effective deployment of medical services in the event of an emergency. This collaboration aims to enhance emergency response and healthcare delivery.**

Natural and Built Environment Resilience

Goal: The natural and built environment in Laguna Beach is safeguarded against damage from hazards.

Strategy 21: Ensure essential services can plan for and adapt to climate change.

The natural landscapes and ecosystems of Laguna Beach are foundational to its culture and economy. As discussed in **Chapter 2,** Laguna Beach's environment is vulnerable to several hazards, including wildfire, flooding, and extreme heat. This strategy aims to prevent damage to Laguna Beach's natural and built environment from potential hazards through actions that move or protect critical infrastructure or factor hazards and their effects into capital planning and development review.

Flood Events and Coastal Adaptation

Strategy 21 Actions

21.1 Shoreline Monitoring Program (Municipal)

>> Develop and implement a Laguna Beach Shoreline Monitoring Program in coordination with regional, State, and federal agencies. This program will monitor hazards related to sea level rise and identify thresholds for action.

21.2 Coastal Flooding Adaptation Projects (Municipal)

>> Integrate coastal flooding adaptation projects into the City's Capital Improvement Program, focusing on resilient transportation, stormwater, and water infrastructure.

21.3 Relocate and Floodproof Infrastructure (Municipal)

>> Explore the feasibility of relocating and/or floodproofing major wastewater, water, and utility lines and infrastructure in areas at risk of sea level rise adjacent to Pacific Coast Highway.

21.4 Floodproof Critical Facilities (Municipal)

>> Require floodproofing for City-owned and managed critical facilities in flood hazard or coastal flood hazard areas to ensure their resilience during flood events.

21.5 Convert Impervious Surfaces (Municipal)

>> Explore the feasibility of converting impervious surfaces into natural areas, such as converting parking lots to permeable paving at Laguna Main Beach Park, to improve drainage and reduce flood risks.

21.6 Integrate Flood Hazards in Development Review (Policy)

>> Incorporate potential flood hazards from sea level rise and emergent groundwater in the development review process for transportation projects, critical infrastructure planning, and new development projects in downtown Laguna Beach.

21.7 Evaluate Drainage Issues (Municipal)

>> Assess and address culvert and road drainage issues in areas identified as vulnerable to coastal flooding to enhance drainage capacity and reduce flood risks.

21.8 Green Infrastructure Design (Policy)

>> Incorporate options for green infrastructure in the design of transportation infrastructure, including permeable pavement, bioswales, and stormwater best management practices.

21.9 Improve Stormwater Infrastructure (Municipal)

>> Evaluate and enhance the capacity of stormwater infrastructure to handle high-intensity rainfall events expected due to climate change.

21.10 Consider Projected Water Levels (Municipal)

>> Account for projected water levels, including sea level rise and rising groundwater, when constructing new or upgraded infrastructure to ensure long-term resilience.

21.11 Update Maintenance Protocols (Municipal)

>> Revise infrastructure and utility maintenance protocols to include considerations for projected climate change effects, ensuring that maintenance practices support resilience.

21.12 Sea Level Rise Planning and Adaptation (Municipal and Policy)

>> Coordinate with adjacent jurisdictions, regional, and State agencies on sea level rise planning, adaptation, and implementation. Consider establishing a Climate Resilience District in partnership with neighboring jurisdictions. Work with local and regional open space managers to develop a comprehensive management strategy for the Laguna Beach greenbelt.

Groundwater Emergence

21.13 Engineering Study on Groundwater Impacts (Municipal)

>> Conduct an engineering study to understand the impacts of potential groundwater emergence in commercial areas between Broadway and Forest in downtown Laguna Beach. This study will address how rising groundwater tables can remobilize legacy contaminants.

Heat

21.14 Heat-Related Risk Education (Education)

>> Develop multi-lingual outreach and education materials on heat-related risks and strategies to prevent heat-related illness for outdoor workers. Distribute these materials

in collaboration with the Laguna Beach Chamber of Commerce to ensure wide reach and accessibility.

21.15 Promote Cool Roofs (Education)

>> Educate roofing installers about the benefits of cool roofs and encourage their installation during roof repairs on existing structures. Cool roofs reduce heat absorption, lower energy costs, and mitigate urban heat island effects.

21.16 Install Cool Pavements (Municipal)

>> Replace streets and sidewalks with cool pavement technologies, such as certain types of asphalt and concrete, during routine repair. Cool pavements reduce urban heat island effects by reflecting more solar energy or enhancing water evaporation to lower the local temperature.

Multi-hazard and Emergency Preparedness

21.17 Reduce Risk to Laguna Canyon Road (Policy)

>> Continue collaborating with Caltrans to minimize the risk of damage or disruption to Laguna Canyon Road from natural hazards. This partnership aims to maintain critical infrastructure and ensure safe travel routes.

21.18 Community-Wide Climate Education Program (Education)

>> Develop a comprehensive climate change education program for residents and visitors. This program will educate the community on natural hazard risks, future risk projections, protective measures, and ways to reduce GHG emissions. Partner with local arts groups to create engaging public education campaigns and provide educational booths at major public events and festivals.

21.19 Climate Change Education for City Staff (Municipal)

>> Educate City staff about the effects of climate change and assist all departments in incorporating climate change hazards into their long-term planning. This internal education will ensure that climate resilience is integrated into the City's operational and strategic planning.

21.20 Support and Expand Emergency Education Programs (Education)

>> Continue to support and expand existing emergency education programs, including the Community Emergency Response Team (CERT) and the Police Department's Cadet/Explorer program. These programs educate and train community members and

youth in emergency preparedness and response, strengthening the overall resilience of the community.

21.21 Incorporate Tourism Needs in Emergency Plans (Policy/Education)

>> Work with major hotels and tourist destinations to ensure that the needs of short-term visitors and tourism workers are included in evacuation and emergency response plans. This will improve the safety and preparedness of the tourism sector during emergencies.

21.22 Prepare Tourism and Recreation Sectors for Hazards (Education)

>> Collaborate with the Laguna Beach Chamber of Commerce to educate and assist the tourism and outdoor recreation sectors in preparing for, responding to, and recovering from hazardous events. This will enhance the resilience and recovery capacity of these sectors.

21.23 Community-Based Social Resiliency Program (Municipal)

>> Introduce a community-based social resiliency program to connect vulnerable residents with neighbors. Community members can perform wellness checks during high heat days, wildfires, floods, and other related climate hazards to ensure vulnerable residents have access to essential resources.

Strategy 22: Plan for the long-term resilience of open space recreation and developed areas.

Laguna Beach is a haven for outdoor recreation and beach enthusiasts and its economy relies on tourism. This strategy ensures that infrastructure critical to Laguna Beach's identity and functioning is protected from potential hazards like flooding and beach erosion.

Strategy 22 Actions

22.1 Preserve Beach Access (Municipal)

>> Implement measures to preserve beach access by elevating or protecting public parking lots, existing public staircases, and public boardwalks to withstand mid-term sea level rise projections. Prioritize resilience efforts at high-use and high-risk locations, including Main Beach and Aliso Beach.

22.2 Incentivize Floodproofing and Elevation (Policy)

>> Develop incentives, such as potential permit streamlining, to encourage floodproofing and the elevation of structures in areas at risk of increased flooding. These incentives will support property owners in adopting measures that reduce flood risks.

22.3 Protect Pacific Coast Highway (Municipal)

>> Plan for the protection of Pacific Coast Highway between Broadway, Park Avenue, and Forest Avenue, where projected sea level rise could impact circulation and emergency services. This proactive planning will ensure the highway remains functional and accessible during emergencies.

22.4 Promote Flood Insurance (Education)

>> Coordinate with the Laguna Beach Floodplain Administrator to educate and encourage property owners in mapped flood hazard areas to obtain appropriate flood insurance. This effort will increase awareness and preparedness among property owners in flood-prone areas.

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CHAPTER 4

REALIZING THE CAAP

REALIZING THE CAAP

To bring Laguna Beach's CAAP to life, the City will embed its climate action and resilience goals into local planning efforts and begin implementing priority strategies. By staying adaptable to new technologies and opportunities, Laguna Beach can efficiently pursue its goals for a resilient and climate-ready future.

Implementing the Climate Action and Adaptation Plan

To ensure the success of the CAAP, the City of Laguna Beach will integrate the climate action and adaptation goals and strategies of this plan into other local plans, such as the General Plan, Local Coastal Program, municipal code, area and specific plans, and prioritize and implement the programs and activities identified in the strategies in **Chapter 2**. This chapter outlines the essential steps for putting the CAAP into action. Effective implementation of the CAAP requires an understanding of the plan's applicability, and considerations for costs and funding sources. **Table 8** lists the applicable implementation details for selected priority actions, while **Table 9** shows these details for all mitigation and adaptation strategies. This section also explores potential funding sources, making it possible for the City to support the CAAP's goals in a financially sustainable way.

City staff will monitor progress and provide updates to the City Council and the community regarding the effectiveness of each strategy to ensure that anticipated emissions reductions are occurring and will report on progress made toward GHG reductions by applicable performance metrics, as outlined in **Appendix C.** If reductions do not occur as expected, the City will modify and add additional strategies and actions to the CAAP to ensure that the reduction targets are achieved.

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Table 8: Priority Implementation Actions

Priority Sector	Priority Strategy	Priority Strategy Topic	Priority Action Number	Priority Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.1	FireWise Community Certification (Municipal): Support initiatives to establish certified FireWise Communities to enhance fire preparedness in neighborhoods. Work with property and homeowners to comply with FireWise standards that are recognized by the National Fire Protection Association and home insurance carriers to ensure fire insurance is provided for neighborhoods located within Very High Fire Hazard Severity Zones (VHFHSZ).	Community Development Fire	Laguna Greenbelt, Inc. Utility Companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.2	Underground Utilities (Policy and Municipal): Continue working with utility companies to expand efforts to underground utilities, prioritizing high-capacity power lines along evacuation routes and areas with elevated fire hazard risks. Underground utilities to reduce fire risk and enhance safety during evacuations.	Public Works Fire	Laguna Greenbelt, Inc. Utility Companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.7	Home Hardening for Fire Safety (Education): Promote the retrofitting of existing structures to reduce vulnerabilities from wildfires and structural fires during wildfire events, increase awareness on home hardening, and explore grant funding for fire safety retrofits.	Community Development Fire	Laguna Greenbelt, Inc. Utility Companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Energy	Strategy 2	Facilitate the private-sector adoption of zero-emission vehicles	Action 2.1	Expand Public EV Charging Infrastructure (Municipal): Install more publicly available EV charging ports at City facilities, including DC Fast Chargers. Consider key locations such as public parking lots, parks, recreation facilities, and City offices, including the Glenneyre Structure, metered parking on Cliff Drive, and additional stations at Laguna Beach City Hall. Regularly maintain chargers and monitor usage rates to ensure appropriate distribution throughout the city. This expansion supports the growing demand for electric vehicle charging and encourages the adoption of electric vehicles by providing accessible charging options.	Public Works Community Development City Manager	SCE SDG&E EV charging network providers	Community residents Businesses	High	Grants

Priority Sector	Priority Strategy	Priority Strategy Topic	Priority Action Number	Priority Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Energy	Strategy 3	Increase residential energy efficiency in new and existing homes	Action 3.1	Mandatory Energy Efficiency Audits (Policy): Require a whole-building energy efficiency audit to be completed during major structural renovations or expansions. This policy ensures that energy efficiency improvements are identified and implemented during significant building projects.	Community Development	SoCalGas SoCalREN SCE SDG&E	New and existing residential development	Medium	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.	Action 4.1	Develop a residential Reach Code (Policy): Create a reach code that surpasses the California Building Standards Code, mandating high energy performance for new construction and remodels. Reach codes are advanced building codes that require higher energy efficiency and performance than state standards, supporting local climate action and greenhouse gas reduction goals.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.	Action 4.2	Development Incentives (Policy): Identify and offer development incentives and streamlined permitting processes for new development projects. This approach can facilitate the adoption of energy-efficient building practices by reducing administrative barriers and costs for developers.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.1	Explore Community Choice Aggregation (CCA) Programs (Municipal/Education): Investigate options to join or establish a CCA program. Promote community participation in 100 percent renewable energy tiers for any program that the City establishes or joins. CCAs allow communities to procure power from alternative suppliers while still receiving transmission and distribution service from their existing utility.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.2	Implement Microgrid Resiliency Infrastructure (Municipal): Follow the recommendations from the City's Microgrid Resiliency Assessment to install solar photovoltaic systems and battery energy storage systems on key City facilities. This will enhance the resilience of the City's energy infrastructure.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants

Priority Sector	Priority Strategy	Priority Strategy Topic	Priority Action Number	Priority Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.3	Install Solar PV Shade Structures (Municipal/Policy): Install solar PV systems as shade structures at City-owned parking lots, recreational facilities, and businesses. This dual-purpose approach provides renewable energy while offering shaded parking and recreational areas.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.1	Procure Zero Emissions Vehicles, Trolleys, and Buses (Municipal): Develop a procurement process to select vendors that provide zero emissions vehicles and buses as recommended by the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This involves identifying reliable suppliers and evaluating vehicle options to ensure they meet the City's sustainability and operational requirements, especially for vehicles operated by public safety agencies.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.3	Install Charging Infrastructure (Municipal): Install EV charging infrastructure at the City's consolidated maintenance facility consistent with the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This will ensure that the City has the necessary infrastructure to support the charging needs of a growing fleet of electric vehicles.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants

Table 9: All GHG Reduction and Adaptation Implementation Actions

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.1	FireWise Community Certification (Municipal): Support initiatives to establish certified FireWise Communities to enhance fire preparedness in neighborhoods. Work with property and homeowners to comply with FireWise standards that are recognized by the National Fire Protection Association and home insurance carriers to ensure fire insurance is provided for neighborhoods located within Very High Fire Hazard Severity Zones (VHFHSZ).	Community Development Fire	Laguna Greenbelt, Inc. Utility Companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.2	Underground Utilities (Policy and Municipal): Continue working with utility companies to expand efforts to underground utilities, prioritizing high-capacity power lines along evacuation routes and areas with elevated fire hazard risks. Underground utilities to reduce fire risk and enhance safety during evacuations.	Public Works Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.3	Promote Fire-Resistant Landscaping (Municipal and Education): Collaborate with building owners and residents to construct and maintain firebreaks, fire-resistant landscaping, and other fire resistance improvements around properties. These measures reduce fire risk and enhance property safety.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.4	Funding for Wildfire Mitigation (Municipal): Prioritize funding and resources to implement the recommendations in the City's Wildfire Mitigation and Fire Safety Report. This ensures that the City can effectively address and mitigate wildfire risks.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.5	Fuel Modification Zones (Municipal): Continue and expand the City's Fuel Modification Zone program to manage vegetation and reduce fire fuel loads in high-risk areas.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.6	Explore AI-based Wildfire Technology (Municipal): Examine the feasibility of implementing AI-based wildfire detection technologies, such as FireScout, to better prepare the community during wildfires. AI allows the early identification of wildfires and can alert emergency personnel as the fire begins. Early identification prevents environmental degradation and reduces the release of greenhouse emissions associated with wildfires.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.7	Home Hardening for Fire Safety (Education): Promote the retrofitting of existing structures to reduce vulnerabilities from wildfires and structural fires during wildfire events, increase awareness on home hardening, and explore grant funding for fire safety retrofits.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment Resilience	Strategy 1	Enhance community resilience to wildfire risks through proactive mitigation and community preparedness	Action 1.8	Fire Adaptation Resources (Education): Share fire adaptation resources via the Fire Adapted Communities Learning Network. This network provides valuable information and strategies to improve community resilience to wildfires.	Community Development Fire	Laguna Greenbelt, Inc. Utility companies Neighborhood Associations Greater Laguna Fire Safe Council Fire Safe Council East Orange County Canyons Orange County Parks	Residents Utility Providers Property Owners City Facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Energy	Strategy 2	Facilitate the private-sector adoption of zero-emission vehicles	Action 2.1	Expand Public EV Charging Infrastructure (Municipal): Install more publicly available EV charging ports at City facilities, including DC Fast Chargers. Consider key locations such as public parking lots, parks, recreation facilities, and City offices, including the Glenneyre Structure, metered parking on Cliff Drive, and additional stations at Laguna Beach City Hall. Regularly maintain chargers and monitor usage rates to ensure appropriate distribution throughout the city. This expansion supports the growing demand for electric vehicle charging and encourages the adoption of electric vehicles by providing accessible charging options.	Public Works Community Development City Manager	SCE SDG&E EV charging network providers	Community residents Businesses	High	Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Energy	Strategy 2	Facilitate the private-sector adoption of zero-emission vehicles	Action 2.2	Study Amendments to CALGreen (Municipal): Investigate amendments to CALGreen that would require new construction to exceed minimum State mandates for the number and types of EV charging infrastructure. Enhancing CALGreen standards would ensure that new developments are better equipped to meet future EV charging needs and support the transition to electric.	Public Works Community Development City Manager	SCE SDG&E EV charging network providers	Community residents Businesses	High	Grants
Energy	Strategy 2	Facilitate the private-sector adoption of zero-emission vehicles	Action 2.3	Information Website for Incentives and Programs (Education): Create a website that hosts information on incentives and programs available for electric vehicles (EVs), e-bikes, and scooters. Promote this information through events, social media, and community groups, helping residents access available resources.	Public Works Community Development City Manager	SCE SDG&E EV charging network providers	Community residents Businesses	High	Grants
Energy	Strategy 3	Increase residential energy efficiency in new and existing homes	Action 3.1	Mandatory Energy Efficiency Audits (Policy): Require a whole-building energy efficiency audit to be completed during major structural renovations or expansions. This policy ensures that energy efficiency improvements are identified and implemented during significant building projects.	Community Development	SoCalGas SocalREN SCE SDG&E	New and existing residential development	Medium	General fund
Energy	Strategy 3	Increase residential energy efficiency in new and existing homes	Action 3.2	Promote Green Building Standards (Education): Encourage the adoption of CALGreen Tier 1 and Tier 2 green building ratings, including Passive House, LEED, Build It Green, Energy Star certifications, and solar requirements per Title 24, for all new developments and renovations. Use pre-approval consultations and educational initiatives to promote these standards.	Community Development	SoCalGas SocalREN SCE SDG&E	New and existing residential development	Medium	General fund
Energy	Strategy 3	Increase residential energy efficiency in new and existing homes	Action 3.3	Outreach to Vulnerable Households (Education): Prioritize direct outreach to residents of older, less energy-efficient homes, low-income households, and households with seniors to promote energy efficiency improvements. This targeted outreach aims to support those in most need of energy-saving measures.	Community Development	SoCalGas SocalREN SCE SDG&E	New and existing residential development	Medium	General fund
Energy	Strategy 3	Increase residential energy efficiency in new and existing homes	Action 3.4	Increase Awareness of Tax Credits, Benefits, Utility Programs and Rebates (Education): Expand property owners' awareness of and access to state and federal tax credits and benefits, including those from the Inflation Reduction Act. Publicize energy efficiency improvement programs and rebates offered by SoCalGas, SDG&E, and	Community Development	SoCalGas SocalREN SCE SDG&E	New and existing residential development	Medium	General fund

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
				SCE. Educating property owners on available financial incentives will encourage more energy-efficient upgrades.					
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.1	Develop a residential Reach Code (Policy): Create a reach code that surpasses the California Building Standards Code, mandating high energy performance for new construction and remodels. Reach codes are advanced building codes that require higher energy efficiency and performance than state standards, supporting local climate action and greenhouse gas reduction goals.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.2	Development Incentives (Policy): Identify and offer development incentives and streamlined permitting processes for new development projects. This approach can facilitate the adoption of energy-efficient building practices by reducing administrative barriers and costs for developers.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.3	Zero Emissions Program Awareness (Education): Collaborate with community partners to educate residents, business owners, and developers about the zero emissions water and space heater program, ensuring that the Laguna Beach community is aware of the program and available incentives, thereby supporting the transition to zero-emission appliances and contributing to improved air quality and reduced greenhouse gas emissions.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.4	Community Tours of Green Buildings (Education): Conduct community tours of all-electric and other innovative green buildings to showcase sustainable building practices and technologies.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.5	Raise Awareness of Indoor Air Quality (Education): Partner with Orange County Public Health Services to raise awareness about the relationship between gas appliances and indoor air quality. Educate the community on how to improve indoor air quality by transitioning to electric appliances.	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund
Energy	Strategy 4	Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources	Action 4.6	Information Website for Incentives and Programs (Education): Create a website that hosts information on electrification and programs available for weatherization. Promote this information through events, social media, and	Community Development	Orange County Public Health Services SCE SDG&E SoCalREN	New and existing residential development	Low	General fund

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
				community groups, helping residents access available resources.					
Off-Road Equipment	Strategy 5	Accelerate the electrification of landscaping, construction, and other outdoor equipment	Action 5.1	Electrify City-Owned Landscaping Equipment (Municipal): Transition City-owned landscaping and other off-road equipment to electric models. This change reduces emissions from gas and diesel-powered equipment, contributing to cleaner air and a reduction in the City's carbon footprint.	Public Works	South Coast Air Quality Management District SCE SDG&E	New development Community Residents Businesses	High	General fund Grants
Off-Road Equipment	Strategy 5	Accelerate the electrification of landscaping, construction, and other outdoor equipment	Action 5.2	Encourage Zero-Emission Landscaping Equipment (Education): Promote the replacement of gas and diesel-powered landscaping equipment with zero-emission models among residents and businesses. This encouragement can include providing information on the benefits of electric equipment, such as reduced noise and emissions, and potential cost savings over time.	Public Works	South Coast Air Quality Management District SCE SDG&E	New development Community Residents Businesses	High	General fund Grants
Off-Road Equipment	Strategy 5	Accelerate the electrification of landscaping, construction, and other outdoor equipment	Action 5.3	Promote Rebate and Exchange Programs (Education): Partner with the South Coast Air Quality Management District to promote programs like the Residential Electric Lawn Mower Rebate Program and the Commercial Electric Lawn & Garden Equipment Exchange Program. These programs offer financial incentives for residents and businesses to switch to electric landscaping equipment, making the transition more affordable and appealing.	Public Works	South Coast Air Quality Management District SCE SDG&E	New development Community Residents Businesses	High	General fund Grants
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.1	Cal Green Tier 1 Compliance (Municipal): Pursue Cal Green Tier 1 compliance for all new City buildings where feasible. This policy ensures that new City constructions meet high energy performance standards, contributing to sustainability and energy efficiency.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.2	Energy Audits for City Buildings (Policy): Conduct energy audits of existing City buildings and facilities to identify opportunities for energy conservation and efficiency upgrades or retrofits. These audits will help pinpoint areas where the City can improve energy efficiency and reduce operational costs.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.3	Short-Term Lodging Ordinance Update (Policy): Modify the City's Short-Term Lodging Ordinance to require the completion of an energy efficiency audit as a condition for application approval. This update will ensure that short-term lodging facilities operate efficiently and contribute to the City's overall energy conservation goals.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.4	Increase Participation in Green Initiatives (Municipal/Education): Improve the City's Green Business Program and enhance community awareness and participation. By promoting this program, the City encourages local businesses to adopt sustainable practices and improve their environmental impact.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.5	Hospitality Industry Partnerships (Education): Work with the hospitality industry to promote sustainable practices within the hospitality sector and enhance the industry's overall environmental impact. i. Encourage energy-efficient property renovations. ii. Promote CALGreen Tier 1 Compliance. iii. Provide educational information on energy conservation to guests. iv. Increase participation in sustainable tourism certification programs like those from the Global Sustainable Tourism Council. This collaboration aims to promote sustainable practices within the hospitality sector and enhance the industry's overall environmental impact.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities	Action 6.6	Promote Energy Efficiency for Businesses (Education): Collaborate with the Laguna Beach Business Club and Laguna Beach Chamber of Commerce to raise awareness of energy efficiency opportunities and benefits for local businesses. This initiative aims to educate businesses on how to reduce energy consumption and costs while contributing to environmental sustainability.	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal buildings and facilities	Medium	General fund Transient Occupancy Tax
Energy	Strategy 6	Increase energy efficiency in existing and new nonresidential buildings, including	Action 6.7	Coordinate Regional GHG Reduction Efforts (Municipal): Implement the CAAP in coordination with other Orange County jurisdictions to create a consistent regional approach to GHG reduction and climate adaptation as	Community Development Public Works City Manager	Chamber of Commerce SCE SDG&E SoCalGas SoCalREN	New and existing nonresidential development Municipal	Medium	General fund Transient Occupancy Tax

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
		retail, hotels, offices, and municipal facilities		outlined in the PCAP. Participate in regional initiatives to promote and incentivize GHG reduction efforts.			buildings and facilities		
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.1	Develop a commercial Reach Code (Municipal): Create a reach code that surpasses the California Building Standards Code, mandating high energy performance for new construction and remodels of City facilities. Reach codes support local climate action and GHG reduction goals.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.2	Transition to Carbon-Free Energy in Municipal Buildings (Municipal): Initiate the shift of municipal buildings and facilities to carbon-free energy sources focusing first on those with outdated fossil fuel appliances and infrastructure. Prioritize buildings equipped with solar photovoltaic and battery energy storage systems.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.3	Carbon-Free Energy for New City Buildings (Municipal): Where feasible, ensure that new City buildings are powered by carbon-free energy sources, supporting the City's commitment to sustainability and reducing greenhouse gas emissions.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.4	Replace Business Appliances with Zero-Emission Options (Policy): In accordance with regulations from the South Coast Air Quality Management District and the California Air Resources Board, mandate the replacement of water heaters and space heaters in businesses with zero-emission appliances at the end of their life cycles.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.5	Share Green Building Practices (Education): Work with the Orange County chapter of the U.S. Green Building Council to disseminate information on green building opportunities and best practices to the Laguna Beach development community. This collaboration aims to foster the adoption of sustainable building practices in local developments.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax
Energy	Strategy 7	Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources	Action 7.6	Highlight Sustainable Hospitality Practices (Education): Work with Visit Laguna Beach to promote hotels and other hospitality businesses that commit to sustainable practices, in coordination with the Green Business Certification Program. This will encourage more businesses to adopt environmentally friendly practices and attract eco-conscious tourists.	Community Development Public Works	Visit Laguna Beach SCE SDG&E SoCalGas U.S. Green Building Council SoCalREN	New and existing nonresidential development Municipal buildings	Medium	General fund Transient Occupancy Tax

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.1	Explore Community Choice Aggregation (CCA) Programs (Municipal/Education): Investigate options to join or establish a CCA program. Promote community participation in 100 percent renewable energy tiers for any program that the City establishes or joins. CCAs allow communities to procure power from alternative suppliers while still receiving transmission and distribution service from their existing utility.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.2	Implement Microgrid Resiliency Infrastructure (Municipal): Follow the recommendations from the City's Microgrid Resiliency Assessment to install solar photovoltaic systems and battery energy storage systems on key City facilities. This will enhance the resilience of the City's energy infrastructure.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.3	Install Solar PV Shade Structures (Municipal/Policy): Install solar PV systems as shade structures at City-owned parking lots, recreational facilities, and businesses. This dual-purpose approach provides renewable energy while offering shaded parking and recreational areas.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.4	Create Interagency Partnership Council (Municipal/Education): Explore the formation of an interagency partnership council with the school district, Laguna Beach County Water District, South Coast Water District, and the City. This committee could identify and pursue partnership opportunities for renewable energy projects throughout the City.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development Municipal buildings	High	General fund Grants
Energy	Strategy 8	Accelerate the transition to renewable, resilient, and efficient power sources across governments	Action 8.5	Promote Solar PV and Battery Systems (Education): Utilize the City's website, newsletters, e-blasts, magazines, and public events to promote the benefits of solar PV and battery systems at all residential and non-residential facilities. Provide resources to help residents and business owners find local solar panel installers and share information about available solar rebates and incentives.	Public Works City Manager	Laguna Beach Unified School District Laguna Beach County Water District South Coast Water District California Community Choice Association	New and existing residential development New and existing nonresidential development	High	General fund Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
							Municipal buildings		
Transportation	Strategy 9	Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips	Action 9.1	Support Multiple Transportation Modes (Policy): Require new developments, and existing nonresidential development upon change in ownership to accommodate various transportation modes. This includes installing EV charging stations, end-of-trip bike facilities, and bike parking. These measures promote sustainable transportation options.	Public Works Transit and Community Services	Visit Laguna Beach	Community residents New and existing nonresidential development	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 9	Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips	Action 9.2	Enhance Neighborhood Transit Services (Municipal): Continue to evaluate the effectiveness of existing neighborhood transit services and work to expand the coverage and hours of the Laguna Beach Local Neighborhood On-Demand Transit service. This includes extending service to the Canyon area and expanding service hours earlier and later in the day, improving accessibility and convenience for residents.	Public Works Transit and Community Services	Visit Laguna Beach	Community residents New and existing nonresidential development	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 9	Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips	Action 9.3	Promote Public Transit (Education): Expand promotion and marketing efforts for the Laguna Beach Trolley and Laguna Beach Local services. Focus on attracting more resident trips by highlighting the convenience, environmental benefits, and cost savings of using these public transit options. Increased usage of public transit can reduce traffic congestion and lower emissions in the community.	Public Works Transit and Community Services	Visit Laguna Beach	Community residents New and existing nonresidential development	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 10	Partner with employers to promote sustainable transportation alternatives for commute trips	Action 10.1	Expand Utilization of Transportation Demand Management Programs (Municipal/Education): Work with local businesses to connect them with OCTA to expand vanpool services for regional commuters to and from Laguna Beach. Help businesses identify economic incentives for these services. Regular collaboration with large employers (e.g., hotels, Mission Hospital, Laguna Beach Unified School District) will help facilitate vanpool sign-ups and promote the program.	Transit and Community Services	Orange County Transportation Authority Laguna Beach Unified School District Chamber of Commerce	Community residents Businesses	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 10	Partner with employers to promote sustainable transportation alternatives for commute trips	Action 10.2	Promote Connectivity with Laguna Beach Transit Services (Educational): Promote the connectivity between OCTA, Laguna Beach transit services, and other coastal city transit services to reduce barriers to using public transit. Improved integration and coordination will make it easier for residents and visitors to use transit options.	Transit and Community Services	Orange County Transportation Authority Laguna Beach Unified School District Chamber of Commerce	Community residents Businesses	High	Transient Occupancy Tax Orange County's Measure M Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Transportation	Strategy 11	Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips within the City	Action 11.1	Develop Aggregated Parking Sites (Municipal): Create parking structures adjacent to transit stops or within/nearby commercial areas to provide easy parking access and promote non-vehicle transportation throughout the city. This initiative aims to reduce traffic congestion and encourage the use of public transit and other alternative transportation modes.	Public Works	Visit Laguna Beach	Visitors	High	Transient Occupancy Tax
Transportation	Strategy 11	Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips within the City	Action 11.2	Develop an Integrated Bicycle Network (Municipal): Develop an integrated bicycle network to connect bike paths in Laguna Beach with other nearby cities, such as Irvine and Newport Beach. A bicycle network will encourage the use of alternative transportation and reduce greenhouse emissions from vehicles.	Public Works	Visit Laguna Beach	Visitors	High	Transient Occupancy Tax
Transportation	Strategy 12	Enhance the City's built environment and road infrastructure to support VMT reduction goals	Action 12.1	Implement Mobility and Complete Streets Plan (Municipal): Revise the City's Enhanced Mobility and Complete Streets Transition Plan to integrate new findings, and implement the Transition Plan. This update will guide the development of Capital Improvement Projects and set new City design standards, ensuring that future infrastructure projects align with current best practices in mobility and complete streets design as well as facilitating simultaneous large-scale evacuation and entry of emergency apparatus at scale in the event of major wildfire or other disaster incidents.	Public Works Community Development	Southern California Council of Governments	Community residents Businesses Visitors	Medium	Transient Occupancy Tax Orange County's Measure M General fund
Transportation	Strategy 12	Enhance the City's built environment and road infrastructure to support VMT reduction goals	Action 12.2	Improve Sidewalk Network (Municipal): Identify and address gaps in Laguna Beach's sidewalk network where sidewalks are missing or severely damaged. Focus on installing and repairing sidewalks and other pedestrian connections to ensure a continuous and safe pedestrian infrastructure. This initiative aims to promote walkability and enhance pedestrian safety throughout the city.	Public Works Community Development	Southern California Council of Governments	Community residents Businesses Visitors	Medium	Transient Occupancy Tax Orange County's Measure M General fund

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.1	Procure Zero Emissions Vehicles, Trolleys, and Buses (Municipal): Develop a procurement process to select vendors that provide zero emissions vehicles and buses as recommended by the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This involves identifying reliable suppliers and evaluating vehicle options to ensure they meet the City's sustainability and operational requirements, especially for vehicles operated by public safety agencies.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.2	Evaluate Fleet and Replacement Cycles (Municipal): Assess the current condition of the City's vehicle fleet and establish replacement cycles that align with financial constraints. This evaluation will help prioritize which vehicles to replace first and plan for a systematic transition to a zero-emissions fleet.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.3	Install Charging Infrastructure (Municipal): Install EV charging infrastructure at the City's consolidated maintenance facility consistent with the Fleet Electrification and Electric Vehicle Charging Infrastructure Master Plan. This will ensure that the City has the necessary infrastructure to support the charging needs of a growing fleet of electric vehicles.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants
Transportation	Strategy 13	Accelerate the public-sector transition to zero-emission vehicles	Action 13.4	Workforce Training (Education): Provide training for mechanics and fleet operators to ensure they can effectively operate and maintain zero emissions vehicles. This training will be crucial for the smooth integration of new technologies into the City's fleet operations.	Public Works City Manager	EV charging network operators	Businesses Municipal buildings and facilities	High	Transient Occupancy Tax Orange County's Measure M Grants
Solid Waste Generation	Strategy 14	Reduce the amount of solid waste sent to landfills	Action 14.1	Achieve Zero-Waste at City Facilities and commercial businesses (Municipal/Policy): Implement three-bin waste systems (for recyclables, organic waste, and landfill waste) at accessible locations in all City facilities. Ensure reusable items are used where food is prepared or consumed. This setup promotes proper waste segregation and reduces overall waste.	Public Works	CR&R	Community residents Businesses	Medium	General fund Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Solid Waste Generation	Strategy 14	Reduce the amount of solid waste sent to landfills	Action 14.2	Maximize Use of Recycled Materials (Municipal/Education): Explore ways to maximize the use of recycled materials throughout the community, including in capital improvement and private construction projects. This could involve using recycled content in building materials, furnishings, and other City infrastructure and private development projects.	Public Works	CR&R	Community residents Businesses	Medium	General fund Grants
Solid Waste Generation	Strategy 14	Reduce the amount of solid waste sent to landfills	Action 14.3	Require Zero-Waste Events (Policy): Mandate that large events permitted by the City must be zero-waste. This initiative ensures that event organizers implement waste reduction strategies, including the use of recyclable, compostable, or reusable materials, and proper waste sorting and disposal practices.	Public Works	CR&R	Community residents Businesses	Medium	General fund Grants
Solid Waste Generation	Strategy 14	Reduce the amount of solid waste sent to landfills	Action 14.4	Establish Construction and Demolition Reuse Programs (Municipal/Education): Connect with businesses that reuse construction and demolition materials to establish programs in Laguna Beach. Publicize the programs to increase community awareness, increase the City's diversion rate, and avoid sending materials to the landfill.	Public Works	CR&R	Community residents Businesses	Medium	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.1	Replace Turf with Native Landscaping (Municipal): Transition turf at City-owned buildings to native, drought-tolerant, and fire-resistant landscaping options. This strategy reduces water usage and enhances fire resistance, contributing to the sustainability and safety of City properties.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.2	Install Rainwater Catchment Systems (Municipal): Identify opportunities for installing rainwater catchment systems at City-owned properties and parks. Develop a plan to implement these systems to capture and utilize rainwater, reducing reliance on potable water for irrigation and other uses.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.3	Water Efficiency in New Development Projects & Major Renovations (Policy): Mandate that new developments and major retrofit projects reduce potable water consumption by incorporating water-efficient appliances, technologies, and drought-tolerant landscaping strategies. These requirements can support long-term water conservation and resilience against drought conditions, while incorporating fuel modification zones and defensible space around structures in keeping with state "Safer from Wildfire" fire prevention standards.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.4	Promote Rebate Programs (Education): Actively promote rebate programs, tax credits, and other incentivizes offered by Southern California Edison, SoCal WaterSmart, the Municipal Water District of Orange County, California Water Wise, and similar regional, state, or federal programs. These programs provide incentives for high-efficiency appliances, turf replacement, irrigation equipment, and rain barrels and cisterns, encouraging the adoption of water conservation and efficiency measures.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.5	Provide Training for Landscapers (Education): Offer training and educational materials to local landscapers on native landscaping as well as water and soil conservation practices. This initiative ensures that landscapers are equipped with the knowledge and skills needed to implement sustainable landscaping practices.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.6	Install Grey Water Systems at City Buildings (Municipal): Where feasible, implement grey water systems at City-owned buildings with landscaping. Grey water systems reuse water from sinks, showers, and laundry for irrigation, significantly reducing the use of potable water for landscaping and promoting water conservation.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	High	General fund Grants
Water	Strategy 15	Reduce potable water use in buildings and urban landscapes	Action 15.7	Streamline Permits for Residential Grey Water Systems (Policy): Develop tools to streamline the permitting process for residents to install grey water systems in their homes. Simplifying the permit process and providing incentives will encourage more homeowners to adopt grey water	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise	Community residents Businesses Municipal buildings and facilities	High	General fund Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
				systems, contributing to overall water conservation efforts in the community.		Laguna Beach County Water District South Coast Water District			
Wastewater	Strategy 16	Reduce GHG emissions associated with wastewater processing	Action 16.1	Install Grey Water Systems at City Buildings (Municipal): Where feasible, implement grey water systems at City-owned buildings with landscaping. Grey water systems reuse water from sinks, showers, and laundry for irrigation, significantly reducing the use of potable water for landscaping and promoting water conservation.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	Medium	General fund Grants
Wastewater	Strategy 16	Reduce GHG emissions associated with wastewater processing	Action 16.2	Streamline Permits for Residential Grey Water Systems (Policy): Develop tools to streamline the permitting process for residents to install grey water systems in their homes. Simplifying the permit process and providing incentives will encourage more homeowners to adopt grey water systems, contributing to overall water conservation efforts in the community.	Public Works Community Development	SCE SoCal WaterSmart Municipal Water District of Orange County California Water Wise Laguna Beach County Water District South Coast Water District	Community residents Businesses Municipal buildings and facilities	Medium	General fund Grants
Open Space	Strategy 17	Increase carbon sequestration on natural and urban lands	Action 17.1	Expand Urban Tree Canopy (Municipal): Increase the urban tree canopy by planting native shade trees throughout Laguna Beach, with a focus on urban heat island areas, while also maintaining fire safe landscaping by adhering to all current and future federal, state and local defensible space requirements. Expanding the tree canopy helps reduce temperatures, improve air quality, and enhance the aesthetic appeal of urban areas. Native trees are particularly beneficial as they are adapted to the local climate and support local biodiversity and fire safety through use of fire-resistant vegetation.	Public Works	Department of Recreation Laguna Canyon Foundation Orange County Parks	Municipal buildings and facilities Park and Open Space Managers	High	Transient Occupancy Tax Grants
Open Space	Strategy 17	Increase carbon sequestration on natural and urban lands	Action 17.2	Enhance Carbon Sequestration (Municipal): Explore methods to increase carbon sequestration on City-owned facilities and public rights-of-way. This can be achieved through increasing composting, mulching, and nutrient management practices. These activities improve soil health, promote plant growth, and increase the amount of carbon stored in vegetation and soil, contributing to the City's sustainability and climate resilience efforts.	Public Works	Department of Recreation Laguna Canyon Foundation Orange County Parks	Municipal buildings and facilities Park and Open Space Managers	High	Transient Occupancy Tax Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Open Space	Strategy 17	Increase carbon sequestration on natural and urban lands	Action 17.3	Install Green Roofs on City Facilities (Municipal/Education): Facilitate the installation of vegetative layers on rooftops of City facilities. Green roofs reduce the urban heat island effect, increase carbon sequestration, improve stormwater management and water quality, and reduce energy use.	Public Works	Department of Recreation Laguna Canyon Foundation Orange County Parks	Municipal buildings and facilities Park and Open Space Managers	High	Transient Occupancy Tax Grants
Open Space	Strategy 17	Increase carbon sequestration on natural and urban lands	Action 17.4	Encourage Carbon Sequestration Landscapes (Education): Develop a community education campaign to encourage planting and managing landscapes that increase carbon sequestration, capture rainwater, and enhance fire safety through maintaining defensible space requirements. Include educational materials, workshops, demonstrations, and financial incentives where feasible.	Public Works	Department of Recreation Laguna Canyon Foundation Orange County Parks	Municipal buildings and facilities Park and Open Space Managers	High	Transient Occupancy Tax Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.1	Home Retrofit Assistance Program (Municipal): Develop a program that provides physical assistance with energy efficiency upgrades, home hardening, and defensible space maintenance for low-income seniors and persons with disabilities. This initiative will help these individuals maintain safe and energy-efficient homes, particularly in the context of disaster preparedness and climate resilience.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.2	Contingency Plans for Transit Services (Municipal): Create contingency plans to ensure the continuity of transit services for senior citizens and persons with disabilities during staffing and fuel shortages. These plans will ensure that vulnerable populations have reliable transportation even during crises.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.3	Accessibility Audit (Municipal): Conduct an accessibility audit of city-owned public spaces and facilities, public transportation paratransit systems, and city-operated digital platforms. Identify and remedy barriers for seniors and persons with disabilities to enhance accessibility in public services.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.4	Support Community Emergency Response Efforts (Municipal): Continue supporting the Community Emergency Response Team (CERT), Lifelong Laguna's Aging-in-Place, and Habitat for Humanity in performing wellness checks on seniors. Train CERT and Aging-in-Place volunteers on completing Home Modification Assessments, and engaging residents in emergency preparation and planning.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.5	Collaborate with Senior Service Providers (Municipal): Work with the Susi Q Senior Center, senior transportation services, Age Well Senior Services, Dayle McIntosh Center-South County Branch, Sally's Fund, LifeLong Laguna, and other senior service providers to ensure that the needs of seniors and people with disabilities are included in evacuation and emergency response plans.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.6	Provide Emergency Preparedness Information (Education): Disseminate information about disaster prevention (especially with respect to fire safety), emergency preparedness, and planning, at the Susi Q Community Center, as well as senior-focused community service groups and senior enrichment activities.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 18	Increase resilience for residents and persons with disabilities	Action 18.7	Develop Personalized Emergency/Disaster Plans for Residents (Education/Municipal): Collaborate with service organizations, neighborhood associations and senior-focused programs such as Age Well Senior Services to develop personalized sustainability, emergency, evacuation, and climate adaptation plans. These plans will address the specific needs of all residents, especially those over age 50 in emergency situations.	Community Development Fire Transit and Community Services	Senior service providers Service providers for people with disabilities SCE SDG&E SoCalREN	Public service agencies and services Emergency services	Medium	Orange County's Measure M Grants
Vulnerable and At-Risk Communities	Strategy 19	Ensure a resilient and thriving artist community	Action 19.1	Support Climate Related Improvements for Artists Housing (Municipal): Assist artists living in unpermitted residences in Laguna Canyon. This program will support the upgrading and retrofitting of their homes to withstand climate-related hazards, ensuring safety and resilience. Additionally, implement an amnesty program for these artists to address the legal and regulatory aspects of their unpermitted residences, offering a pathway to compliance and improved living conditions.	Community Development City Manager Cultural Arts	Visit Laguna Beach Orange County Housing Finance Trust Orange County Housing Authority	Artists New and existing residential development	High	Grants
Vulnerable and At-Risk Communities	Strategy 20	Increase resilience and adaptation for residents	Action 20.1	Enhance Flood and Wildfire Warning Systems (Education): Improve the dissemination of flood and wildfire warnings and emergency information, focusing on reaching those who lack internet access and cell phones, and those for whom English is a second language. Implement strategies such as multilingual alerts, community outreach programs, and traditional communication methods to ensure comprehensive emergency communication systems.	Community Development Fire	Orange County Health Care Agency Emergency Medical Volunteer Group Providence Mission Hospital Laguna Beach Community Clinic Visit Laguna Beach	Water services Health services New and existing residential development Homelessness services	Low	Transient Occupancy Tax Grants

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Vulnerable and At-Risk Communities	Strategy 20	Increase resilience and adaptation for residents	Action 20.2	Incentivize Clean Air and Cooling Centers (Policy): Support and incentivize owners of hotels, motels, and short-term rental properties to upgrade their facilities to serve as clean air and cooling centers for visitors. Ensure these facilities have sufficient backup power supplies to provide safe and comfortable environments during extreme weather events.	Community Development Fire	Orange County Health Care Agency Emergency Medical Volunteer Group Providence Mission Hospital Laguna Beach Community Clinic Visit Laguna Beach	Water services Health services New and existing residential development Homelessness services	Low	Transient Occupancy Tax Grants
Vulnerable and At-Risk Communities	Strategy 20	Increase resilience and adaptation for residents	Action 20.3	Accommodate Displaced Individuals (Municipal): Collaborate with hotels, motels, and short-term rental property owners to make unused rooms available to residents temporarily displaced by wildfires or other major disaster incidents to provide temporary, short-term shelter for local disaster victims.	Community Development Fire	Orange County Health Care Agency Emergency Medical Volunteer Group Providence Mission Hospital Laguna Beach Community Clinic Visit Laguna Beach	Water services Health services New and existing residential development Homelessness services	Low	Transient Occupancy Tax Grants
Vulnerable and At-Risk Communities	Strategy 20	Increase resilience and adaptation for residents	Action 20.4	Collaborate on Medical Services Deployment (Municipal): Work with Orange County Health Care Agency, the Emergency Medical Volunteer Group, Providence Mission Hospital, and Laguna Beach Community Clinic to ensure the timely and effective deployment of medical services in the event of an emergency. This collaboration aims to enhance emergency response and healthcare delivery.	Community Development Fire	Orange County Health Care Agency Emergency Medical Volunteer Group Providence Mission Hospital Laguna Beach Community Clinic Visit Laguna Beach	Water services Health services New and existing residential development Homelessness services	Low	Transient Occupancy Tax Grants
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.1	Shoreline Monitoring Program (Municipal): Develop and implement a Laguna Beach Shoreline Monitoring Program in coordination with regional, state, and federal agencies. This program will monitor sea level rise-related hazards and identify thresholds for action.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.2	Coastal Flooding Adaptation Projects (Municipal): Integrate coastal flooding adaptation projects into the City's Capital Improvement Program, focusing on resilient transportation, stormwater, and water infrastructure.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.3	Relocate and Floodproof Infrastructure (Municipal): Explore the feasibility of relocating and/or floodproofing major wastewater, water, and utility lines and infrastructure in areas at risk of sea level rise adjacent to Pacific Coast Highway.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.4	Floodproof Critical Facilities (Municipal): Require floodproofing for City-owned and managed critical facilities in flood hazard or coastal flood hazard areas to ensure their resilience during flood events.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.5	Convert Impervious Surfaces (Municipal): Explore the feasibility of converting impervious surfaces into natural areas, such as converting parking lots to permeable paving at Laguna Main Beach Park, to improve drainage and reduce flood risks.	Community Development Fire City Manager Public Works	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.6	Integrate Flood Hazards in Development Review (Policy): Incorporate potential flood hazards from sea level rise and emergent groundwater in the development review process for transportation projects, critical infrastructure planning, and new development projects in downtown Laguna Beach.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.7	Evaluate Drainage Issues (Municipal): Assess and address culvert and road drainage issues in areas identified as vulnerable to coastal flooding to enhance drainage capacity and reduce flood risks.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.8	Green Infrastructure Design (Policy): Incorporate options for green infrastructure in the design of transportation infrastructure, including permeable pavement, bioswales, and stormwater best management practices.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.9	Improve Stormwater Infrastructure (Municipal): Evaluate and enhance the capacity of stormwater infrastructure to handle high-intensity rainfall events expected due to climate change.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.10	Consider Projected Water Levels (Municipal): Account for projected water levels, including sea level rise and rising groundwater, when constructing new or upgraded infrastructure to ensure long-term resilience.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.11	Update Maintenance Protocols (Municipal): Revise infrastructure and utility maintenance protocols to include considerations for projected climate change effects, ensuring that maintenance practices support resilience.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Flood Events and Coastal Adaptation*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.12	Sea Level Rise Planning and Adaptation (Municipal and Policy): Coordinate with adjacent jurisdictions, regional, and state agencies on sea level rise planning, adaptation, and implementation. Consider establishing a Climate Resilience District in partnership with neighboring jurisdictions. Work with local and regional open space managers to develop a comprehensive management strategy for the Laguna Beach greenbelt.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Groundwater Emergence*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.13	Engineering Study on Groundwater Impacts (Municipal): Conduct an engineering study to understand the impacts of potential groundwater emergence in commercial areas between Broadway and Forest in downtown Laguna Beach. This study will address how rising groundwater tables can remobilize legacy contaminants.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Heat*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.14	Heat-Related Risk Education (Education): Develop multi-lingual outreach and education materials on heat-related risks and strategies to prevent heat-related illness for outdoor workers. Distribute these materials in collaboration with the Laguna Beach Chamber of Commerce to ensure wide reach and accessibility.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment: *Heat*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.15	Promote Cool Roofs (Education): Educate roofing installers about the benefits of cool roofs and encourage their installation during roof repairs on existing structures. Cool roofs reduce heat absorption, lower energy costs, and mitigate urban heat island effects.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Heat*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.16	Install Cool Pavements (Municipal): Replace streets and sidewalks with cool pavement technologies, such as certain types of asphalt and concrete, during routine repairments. Cool pavements reduce urban heat island effects by reflecting more solar energy or enhancing water evaporation to lower the local temperature.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.17	Reduce Risk to Laguna Canyon Road (Policy): Continue collaborating with Caltrans to minimize the risk of damage or disruption to Laguna Canyon Road from natural hazards. This partnership aims to maintain critical infrastructure and ensure safe travel routes.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.18	Community-Wide Climate Education Program (Education): Develop a comprehensive climate change education program for residents and visitors. This program will educate on natural hazard risks, future risk projections, protective measures, and ways to reduce greenhouse gas (GHG) emissions. Consider partnering with local arts groups to create engaging public education campaigns and provide educational booths at major public events and festivals.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.19	Climate Change Education for City Staff (Municipal): Educate City staff about the effects of climate change and assist all departments in incorporating climate change hazards into their long-term planning. This internal education will ensure that climate resilience is integrated into the City's operational and strategic planning.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.20	Support and Expand Emergency Education Programs (Education): Continue to support and expand existing emergency education programs, including the Community Emergency Response Team (CERT) and the Police Department's Cadet/Explorer program. These programs educate and train community members and youth in emergency preparedness and response, strengthening the overall resilience of the community.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.21	Incorporate Tourism Needs in Emergency Plans (Policy/Education): Work with major hotels and tourist destinations to ensure that the needs of short-term visitors and tourism workers are included in evacuation and emergency response plans. This will improve the safety and preparedness of the tourism sector during emergencies.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.22	Prepare Tourism and Recreation Sectors for Hazards (Education): Collaborate with the Laguna Beach Chamber of Commerce to educate and assist the tourism and outdoor recreation sectors in preparing for, responding to, and recovering from hazardous events. This will enhance the resilience and recovery capacity of these sectors.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment: *Multi-hazard and Emergency Preparedness*	Strategy 21	Ensure essential services can plan for and adapt to climate change	Action 21.23	Community-Based Social Resiliency Program (Municipal): Introduce a community-based social resiliency program to connect vulnerable residents with neighbors. Community members can perform wellness checks during high heat days, wildfires, floods, and other related climate-hazards to ensure vulnerable residents have access to essential resources.	Community Development Fire City Manager	Laguna Greenbelt Inc. SCE California Coastal Commission Laguna Beach County Water District South Coast Water District Chamber of Commerce	Municipal operations Emergency services and facilities Businesses	High	Transient Occupancy Tax General fund Orange County's Measure M
Natural and Built Environment	Strategy 22	Plan for the long-term resilience of open space recreation and developed areas	Action 22.1	Preserve Beach Access (Municipal): Implement measures to preserve beach access by elevating or protecting public parking lots, existing public staircases, and public boardwalks to withstand mid-term sea level rise projections. Prioritize resilience efforts at high-use and high-risk locations, including Main Beach, and Aliso Beach.	Public Works Community Development	Caltrans Laguna Beach Flood Plain Administrator	Municipal operations Emergency services and facilities Visitors Businesses	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment	Strategy 22	Plan for the long-term resilience of open space recreation and developed areas	Action 22.2	Incentivize Floodproofing and Elevation (Policy): Develop incentives, such as potential permit streamlining, to encourage floodproofing and the elevation of structures in areas at risk of increased flooding. These incentives will	Public Works Community Development	Caltrans Laguna Beach Flood Plain Administrator	Municipal operations Emergency services and facilities	High	Transient Occupancy Tax General fund Grants Orange County's Measure M

Sector	Strategy	Strategies Topic	Action Number	Action Description	Lead Department(s)	Supporting External Agency or Organization	Applicability	Resource Needs (Low, Medium, High)	Potential Funding Sources
				support property owners in adopting measures that reduce flood risks.			Visitors Businesses		
Natural and Built Environment	Strategy 22	Plan for the long-term resilience of open space recreation and developed areas	Action 22.3	Protect Pacific Coast Highway (Municipal): Plan for the protection of Pacific Coast Highway between Broadway, Park Avenue, and Forest Avenue, where projected sea level rise could impact circulation and emergency services. This proactive planning will ensure the highway remains functional and accessible during emergencies.	Public Works Community Development	Caltrans Laguna Beach Flood Plain Administrator	Municipal operations Emergency services and facilities Visitors Businesses	High	Transient Occupancy Tax General fund Grants Orange County's Measure M
Natural and Built Environment	Strategy 22	Plan for the long-term resilience of open space recreation and developed areas	Action 22.4	Promote Flood Insurance (Education): Coordinate with the Laguna Beach Flood Plain Administrator to educate and encourage property owners in mapped flood hazard areas to obtain appropriate flood insurance. This effort will increase awareness and preparedness among property owners in flood-prone areas.	Public Works Community Development	Caltrans Laguna Beach Flood Plain Administrator	Municipal operations Emergency services and facilities Visitors Businesses	High	Transient Occupancy Tax General fund Grants Orange County's Measure M

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Implementation Strategies

The following are three strategies and accompanying actions for implementing the CAAP and regularly monitoring its effectiveness in reducing GHG emissions from the community and local government operations and improving adaptive capacity.

Implementation Strategy 1: Dedicate necessary resources to implement the Climate Action and Adaptation Plan.

Action 1.1: Identify key City staff to support the coordination of the CAAP implementation, including monitoring and reporting.

Action 1.2: Incorporate implementation of the CAAP into the City's budget.

Action 1.3: Include climate action and adaptation strategies in department work plans, the capital improvement program, and other City plans as appropriate.

Action 1.4: Pursue local, regional, State, and federal grants, tax credits, and other payment programs to support implementation.

Action 1.5: Identify dedicated funding sources for CAAP implementation.

Implementation Strategy 2: Regularly monitor and report progress toward Climate Action and Adaptation Plan target achievement and update the plan as needed.

Action 2.1: Prepare regular progress reports on implementation of the recommended GHG reduction strategies for review and consideration by the City Council. When information is available, provide updates on estimated GHG emissions reductions and current GHG emissions levels.

Action 2.2: Develop a publicly accessible dashboard to reflect the progress of climate strategies and ensure that information is refreshed often.

Action 2.3: Complete a community-wide and local government operations GHG emissions inventory every five years, if not more frequently.

Action 2.4: Review and update the CAAP (if necessary) within five years of adoption to incorporate recent technology, practices, and other options to further reduce emissions.

Implementation Strategy 3: Participate in collaborative partnerships with agencies and community groups that support Climate Action and Adaptation Plan implementation.

Action 3.1: Continue formal membership and participation in organizations that provide tools and support for energy efficiency and energy conservation, GHG emissions reductions, adaptative actions, community engagement, and implementation of the CAAP.

Action 3.2: Continue to involve community-based organizations and other key stakeholders in reviewing, recommending, and implementing CAAP action items.

Action 3.3: At the direction of City Council, commit to formal membership through joint powers authorities or other partnerships to implement high-priority strategies from the CAAP.

Action 3.4: Provide policy input to partner agencies (e.g., SDG&E, SCE, SCAQMD, Caltrans) on policy barriers that need to be addressed at the State level.

Appendices

Appendix A	**State and Regional Climate Change Mitigation and Adaptation Plans and Programs**
Appendix B	**Greenhouse Gas Inventories and Forecast Appendix**
Appendix C	**Quantification Technical Appendix and Key Assumptions**

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Works Cited

[1] Louise Bedsworth, Dan Cayan, Guido Franco, Leah Fisher, and Sonya Ziaja, "Statewide Summary Report," in California's Fourth Climate Change Assessment, publication no. SUMCCCA4-2018-013, 2018.

[2] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf.

[3] Intergovernmental Panel on Climate Change, "Annex II: Glossary," ed. K. J. Mach, S. Planton, and C. von Stechow, in Climate Change 2014: Synthesis Report, ed. Core Writing Team, R. K. Pachauri, and L. A. Meyer (Geneva, Switzerland: IPCC, 2014), p. 117–130, https://www.ipcc.ch/report/ar5/syr/.

[4] California Office of Emergency Services. 2020 California Adaptation Planning Guide. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/california-climate-adaptation

[5] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231, http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf.

[6] Intergovernmental Panel on Climate Change, "Annex II: Glossary," ed. K. J. Mach, S. Planton, and C. von Stechow, in Climate Change 2014: Synthesis Report, ed. Core Writing Team, R. K. Pachauri, and L. A. Meyer (Geneva, Switzerland: IPCC, 2014), p. 117–130, https://www.ipcc.ch/report/ar5/syr/.

[7] California Department of Transportation. 2021. Director's Policy. https://dot.ca.gov/-/media/dot-media/programs/sustainability/documents/dp-37-complete-streets-a11y.pdf

[8] California Governor's Office of Business and Economic Development. 2021. California Zero-Emission Vehicles Market Development Strategy. https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV_Strategy_Feb2021.pdf.

[9] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231, http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf.

[10] PolicyLink, Equity Manifesto, 2015, 2018, https://www.policylink.org/about-us/equitymanifesto.

[11] Louise Bedsworth, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja, "Statewide Summary Report," in California's Fourth Climate Change Assessment, publication number: SUMCCCA4-2018-013, 2018.

[12] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231.

[13] International Panel on Climate Change, "Glossary of Terms," in Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, special report of Working Groups I and II of the IPCC, ed. C. B. Field et al. (Cambridge, UK, and New York: Cambridge University Press, 2012), p. 555–564, https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_Full_Report-1.pdf.

[14] California Office of the State Fire Marshal. 2021. Fire Hazard Severity Zones. https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/.

[15] World Resources Institute, C40 Cities, ICLEI Local Governments for Sustainability. 2021. Global Protocol for Community-Scale Greenhouse Gas Inventories. https://ghgprotocol.org/sites/default/files/standards/GPC_Full_MASTER_RW_v7.pdf

[16] California Plumbing Code. 2019. California Plumbing Code Chapter 16A, Section 1604A.0.

[17] California Office of Emergency Services, California State Hazard Mitigation Plan, 2018, https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigationplanning/state-hazard-mitigation-plan.

[18] California Office of Emergency Services, California State Hazard Mitigation Plan, 2018.

[19] California Office of Emergency Services. 2020 California Adaptation Planning Guide. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/california-climate-adaptation

[20] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231.

[21] Louise Bedsworth, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja, "Statewide Summary Report," in California's Fourth Climate Change Assessment, publication number: SUMCCCA4-2018-013, 2018.

[22] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231.

[23] California Office of Emergency Services, California State Hazard Mitigation Plan, 2018, https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigationplanning/state-hazard-mitigation-plan.

[24] California Natural Resources Agency and California Ocean Protection Council. 2018. State of California Sea-Level Rise Guidance, 2018 Update. https://opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf.

[25] California Natural Resource Agency, Safeguarding California Plan: 2018 Update: California's Climate Adaptation Strategy, 2018, p. 231.

[26] California Office of Emergency Services. 2020 California Adaptation Planning Guide. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/california-climate-adaptation

[27] California Environmental Protection Agency. 2022. Urban Heat Island Index for California. https://calepa.ca.gov/climate/urban-heat-island-index-for-california.

[28] World Bank, Climate & Disaster Risk Screening Tools: Key Terms, 2019, https://climatescreeningtools.worldbank.org/content/key-terms-0.

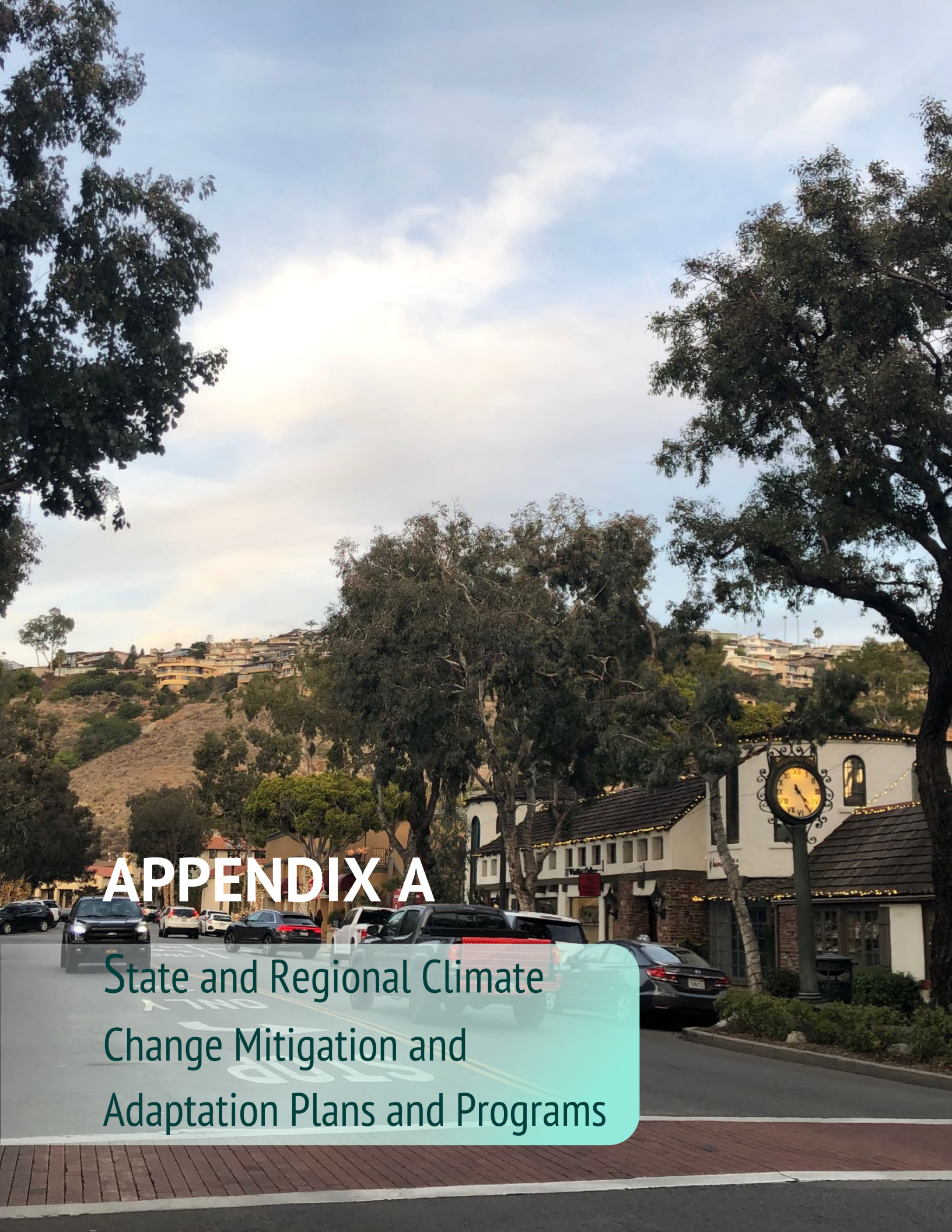
[29] California Office of Emergency Services. 2020 California Adaptation Planning Guide. https://www.caloes.ca.gov/cal-oes-divisions/hazard-mitigation/hazard-mitigation-planning/california-climate-adaptation

[30] California Governor's Office of Business and Economic Development. 2021. California Zero-Emission Vehicles Market Development Strategy. https://static.business.ca.gov/wp-content/uploads/2021/02/ZEV_Strategy_Feb2021.pdf.

[31] Bedsworth, Louise, Dan Cayan, Guido Franco, Leah Fisher, Sonya Ziaja, 2018, "Statewide Summary Report," in *California's Fourth Climate Change Assessment*, prepared by California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, California Public Utilities Commission, publication no. SUM-CCCA4-2018-013.

[32] City of Laguna Beach. 2021. City of Laguna Beach Greenhouse Gas Emission Inventory.

[33] California Air Resources Board. (n.d.). Frequently asked questions: Wildfire emissions. https://ww2.arb.ca.gov/resources/documents/frequently-asked-questions-wildfire-emissions.



APPENDIX A

State and Regional Climate Change Mitigation and Adaptation Plans and Programs

APPENDIX A: STATE AND REGIONAL CLIMATE CHANGE MITIGATION AND ADAPTATION PLANS AND PROGRAMS

There are several State and regional climate action and adaptation plans and programs that provide context and support for Laguna Beach's efforts. This appendix lists the plans, resources, and programs in California and Orange County that support the mitigation of GHG emissions and increase the region's resilience to climate change-related hazards. This list is in addition to the countywide and State programs and regulations discussed in the main CAAP.

GHG Emission Mitigation

Connect SoCal: 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy

Connect SoCal outlines a vision for long-term regional growth and transportation in Southern California with a focus on reducing greenhouse gas (GHG) emissions, promoting public transit, and integrating land use with transportation planning. It includes strategies to provide mobility options beyond private car use, improve air quality, and accommodate population growth while promoting sustainable development through mixed-use, transit-oriented, compact communities and active transportation options such as biking and walking. Through the accompanying Sustainable Communities Program, Southern California Association of Governments (SCAG) offers local technical assistance in support of Connect SoCal implementation.

Caltrans District 12 Active Transportation Plan

The Caltrans 2022 Active Transportation Plan for District 12 (Orange County) identifies pedestrian and bicycle needs on and across the State Highway System, including Pacific Coast Highway. The plan prioritizes highway segments and crossings to influence future investments. It also notes the significant lack of a bicycle network in Laguna Beach and the lack of connections to surrounding communities. The plan provides lists and maps of location-based needs and prioritizes highway crossings.

Adaptation and Resilience

California 2021 Climate Adaptation Strategy

The California Climate Adaptation Strategy, mandated by Assembly Bill 1482, provides state-level adaptation priorities, goals, and actions, which are updated every three years. The 2021 update to the Climate Adaptation Strategy provides actionable strategies and includes a success metric for each action, a timeframe, identification of a responsible agency, and a progress indicator. Since 2021, the State has provided yearly implementation progress reports and has updated the progress indicator for each action as the success metric is met. State-level plans and strategies ultimately impact local geographies, including Laguna Beach. For example, the 2021 Adaptation Strategy includes actions to protect and restore kelp forest ecosystems, mitigate wildfire through the implementation of fuel breaks and improved forest health, and prioritizing the use of natural infrastructure to protect and restore watersheds, coasts, marine waters, and ecosystems. The 2024 strategy is currently in development, and at the time of writing is in draft form.

California Adaptation Planning Guide

The California Adaptation Planning Guide (APG) is a comprehensive resource designed to help California communities prepare for the impacts of climate change. Developed by the California Governor's Office of Emergency Services, it provides guidance, tools, and best practices for local governments to assess vulnerabilities, identify adaptation strategies, and build resilience across various sectors, including infrastructure, public health, and natural resources. The APG supports communities in integrating climate adaptation into planning processes, ultimately aiming to safeguard residents,

economies, and ecosystems against increasing risks like extreme heat, wildfires, and sea level rise. The APG informed the vulnerability assessment and adaptation planning portion of the CAAP.

California Extreme Heat Action Plan

The California Governor's Office prepared the Extreme Heat Action Plan, published in 2022, which details the State's strategy for addressing extreme heat. The plan's actions are organized into four tracks: building public awareness, strengthening community services and response, increasing the resilience of the built environment, and using nature-based solutions. The plan highlights the various technical assistance resources and grant opportunities available to Laguna Beach and other local communities.

Listos California

A part of the Governor's Office of Emergency Services, Listos California works with a network of community-based organizations, tribal governments, and Community Emergency Response Teams across the state to provide culturally appropriate education programs for wildfire, flood, drought, extreme heat, and other types of disasters. This organization provides accessible information to advance a culture of disaster preparedness that Laguna Beach can use to bolster community resilience.

Fire Hazard Planning Technical Advisory

The Governor's Office of Planning and Research, in partnership with the Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection (CAL FIRE) published the Fire Hazard Planning Technical Advisory in 2022. This guidance document contains an overview of important challenges created by wildfire, the State's wildfire management regulatory framework for the State Responsibility Areas, guidance for fire hazard planning, and a set of example policies to reduce wildfire risks.

Exhausted! Workers Confront Extreme Heat and Wildfire Smoke in California

Climate Resolve, a nonprofit organization focused on reducing climate pollution and preparing for climate impacts, published Exhausted! Workers Confront Extreme Heat and Wildfire Smoke in California in 2022. This report documents the conditions for both outdoor and indoor workers, provides an overview of existing regulations, and assesses the policy gap for workers. The report also provides policy and program recommendations for protecting both indoor and outdoor workers through both State and local actions. While this resource mainly focuses on outdoor laborers, such as farmworkers and construction crews, its policy guidance is still relevant to communities like Laguna Beach that rely on outdoor recreation as part of their local economy. Lifeguards and other outdoor workers in coastal regions are also impacted by extreme heat and wildfire smoke.

Southern California Association of Governments Climate Equity Compendium

The Climate Equity Compendium provides resources for local planners in the South Coast Association of Governments (SCAG) region to advocate for and implement equitable and actionable solutions for their jurisdiction's climate adaptation efforts. SCAG developed the Compendium in partnership with more than 60 local jurisdictions, focusing on the major climate adaptation concerns for local agencies: providing resources to assist with staff and funding shortages, removing barriers to relevant data and resources, and overcoming the challenges of effective, equitable outreach. SCAG will continue to update the Climate Equity Compendium as the challenges of climate equity evolve.

Regional Climate Adaptation Framework and Guide

SCAG developed the Regional Climate Adaptation Framework to assist local and regional jurisdictions in managing the negative impacts of climate change. The Framework provides an overview of how jurisdictions in the Southern California region can work together to plan and prepare for the impacts of sea level rise, extreme heat, increasingly frequent and damaging wildfires, and other climate-related issues. By offering a cohesive approach that aligns with regional efforts, the guide can help Laguna Beach develop targeted adaptation measures that enhance community resilience and integrate with broader Southern California climate initiatives.

Southern California Green Region Initiative Maps

The Green Region Initiative (GRI) Maps are a series of maps for jurisdictions in the SCAG region to measure and track sustainability progress in the region across 12 categories and 29 sustainability indicators. These maps are designed to provide helpful information on the status of adaptation planning in the Southern California region and the degree to which policies address various climate change risks, from "acknowledgement of climate risks" to "adopting a stand-alone plan or general plan that addresses numerous relevant climate risks." The City of Laguna Beach can use these maps to identify successful actions in other communities that can be adapted to Laguna Beach to support implementation of the CAAP strategies.

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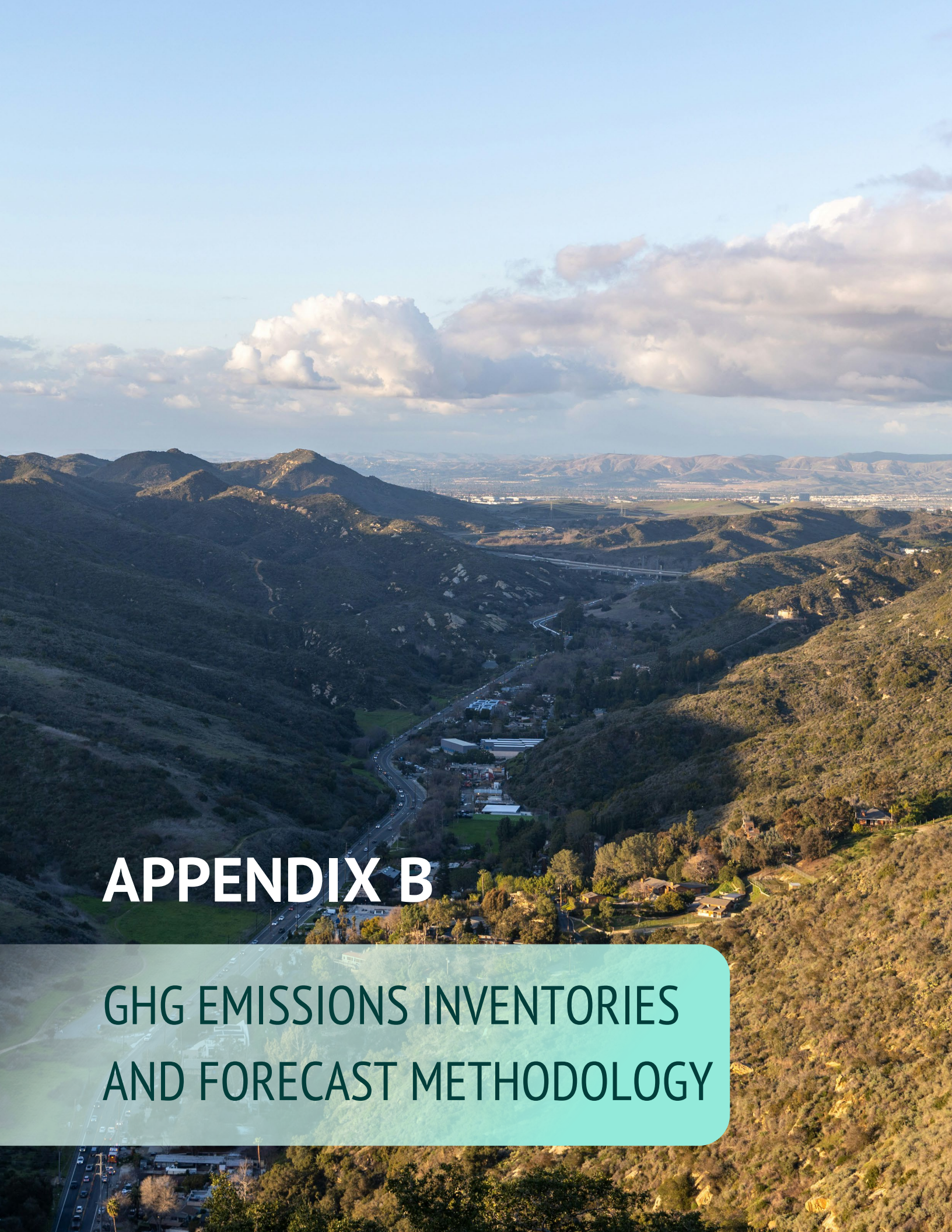


APPENDIX B

GHG EMISSIONS INVENTORIES AND FORECAST METHODOLOGY

APPENDIX B: GHG EMISSIONS INVENTORIES AND FORECAST METHODOLOGY

The Climate Action and Adaptation Plan (CAAP) includes strategies to reduce greenhouse gas (GHG) emissions and adapt to climate change-related hazards. The GHG emissions reduction component addresses emissions from community-wide activities and municipal government operations. A first step in preparation of a CAAP is to assess current GHG emissions within the community and to forecast those emissions to future years based on current growth assumptions. The project team reviewed and updated GHG emissions inventories for 2018, prepared an inventory of GHG emissions for the calendar year 2021, and forecasted GHG emissions to 2030 and 2045. All GHG inventories and forecasts assess community-wide sources and City operations. This work occurred during April through November 2023.

This appendix provides the draft results of the GHG emissions inventories from 2018 and 2021 along with a business-as-usual (BAU) forecast of emissions for the years 2030 and 2045. Forecasting GHG emissions assists the City of Laguna Beach in establishing attainable emissions reduction goals for subsequent years, building on work that has been a community priority for over a decade. Furthermore, associating GHG emissions with specific activities allows the City the opportunity to develop targeted policies and programs to facilitate GHG emissions reduction.

GHG emissions are generated by commonplace daily activities. Some GHG emissions are released at the location of the activity, such as carbon dioxide emissions from a vehicle's internal combustion engine. Alternatively, other activities, such as using fossil fuel-derived

electricity in a building, cause GHG emissions to be released elsewhere, at the location of the power plant. Therefore, for this analysis, the City must consider GHG emissions attributable to community activities and government operations, including GHG emissions generated at facilities or locations outside Laguna Beach's jurisdictional boundary. The inventories included in this appendix and the CAAP estimate emission levels of the three most common GHGs from human activities: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs are not emitted in Laguna Beach or are only emitted in trace amounts and cannot be accurately assessed.

The CAAP contains two types of GHG inventories: (1) a community-wide inventory; and (2) a government or City operations inventory.

- A **community-wide inventory** identifies GHG emissions that result from activities of Laguna Beach residents, businesses, visitors, and other community members. Examples include residents driving cars, homes using water, and businesses using electricity.
- A **government operations inventory** summarizes emissions that are a direct result of the City's municipal government operations. Examples include electricity and water used in municipal buildings or the fuel used for City vehicles.

Laguna Beach completed its first community-wide GHG inventory in 2009 as part of the Laguna Beach City Climate Protection Action Plan (CPAP). The CPAP established 1990 as the baseline level of emissions using per-capita averages of California state level emissions, and estimated community-wide emissions for the years 1990 and 2004.

For the CAAP, the project team prepared a 2021 community-wide and government operations GHG inventories and updated the existing 2018 community-wide and government operations inventories using current methods as compared to previous reports. Specific changes to the methods are discussed in the following section. This appendix discusses the methods used to prepare the GHG inventories, the results of the inventories, and the results of the BAU forecasts.

Methods

Protocols

Guidance documents, called protocols, provide recommendations on how to adequately assess GHG emissions. The project team prepared the inventory in a manner consistent with two widely adopted, standard protocol documents, the Local Government Operations Protocol, and the United States Community Protocol for Accounting and Reporting of Greenhouse Gas

Emissions. These protocols provide guidance by defining what activities should be included in the GHG inventory, and how to consistently estimate emissions from those activities. The use of standard methods allows for comparison of GHG emissions across multiple years and communities.

- **The Local Government Operations Protocol (LGOP)** was first developed by the California Air Resources Board in 2008 and updated in 2010. The LGOP is a tool for accounting and reporting GHG emissions of local government operations and is used throughout California and the United States. The LGOP includes guidance from several existing partner programs[1] as well as the State's mandatory GHG reporting regulations. This protocol provided guidance for the majority of the estimates made in the government operations inventory.
- **The United States Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol)** was first developed by ICLEI – Local Governments for Sustainability USA in 2012 and updated most recently in 2019. The California Governor's Office of Planning and Research encourages cities and counties in California to follow the U.S. Community Protocol for community-wide GHG emissions. It is also used in this government operations inventory in limited cases where the LGOP lacks specific calculations for an emissions type, for example, wastewater emissions.

GHG inventories are estimates of GHG emissions rather than direct measurements of emissions. The use of the standard methods identified in the protocols, in combination with verified datasets from appropriate sources, makes GHG inventories accurate and consistent estimates of local emissions.

Units of Measurement

The GHG inventories report emissions in carbon dioxide equivalents (CO_2e), which is a unit that allows combined reporting of all GHGs analyzed in the inventory. CO_2e is a weighted unit that reflects each GHG's relative potency. Non-carbon dioxide GHGs (methane and nitrous oxide) are converted to an equivalent quantity of carbon dioxide based on their global warming potential. The inventory reports the amount of GHGs in metric tons of CO_2e ($MTCO_2e$). One metric ton is equal to 1,000 kilograms or approximately 2,205 pounds.

[1] These partner programs include the California Climate Action Registry, ICLEI – Local Governments for Sustainability, The Climate Registry, and other stakeholders.

Emission Factors

In accordance with the protocols, most of the GHG emissions are calculated using data on GHG-generating activities in combination with emission factors. An emission factor describes how many $MTCO_2e$ are released per unit of an activity. For instance, an emissions factor for electricity describes the $MTCO_2e$ produced per kilowatt-hour (kWh) of electricity used, or an emission factor for on-road transportation describes the $MTCO_2e$ produced per mile of driving. Emission factors may change from year to year based on changes in the technologies, fuels, or behaviors associated with the emissions. For example, an increase in vehicle fuel efficiency and greater adoption of zero-emission vehicles causes a decrease in emission factors for on-road vehicles. **Table B-1** lists the emissions factors for 2018 and 2021.

Table B-1: Emission Factors

Sector	Unit	2018	2021	Percentage Change	Source
Electricity	Per kWh	0.000233	0.000263	13%	Southern California Edison
Electricity	Per kWh	0.000274	0.000229	-16%	San Diego Gas & Electric
Natural gas	Per therm	0.005312	0.005312	0%	SoCal Gas
On-road transportation (light duty)	Per mile	0.000333	0.000330	-1%	California Air Resources Board
On-road transportation (heavy duty)	Per mile	0.001356	0.001045	-23%	California Air Resources Board
On-road transportation (combined)	Per mile	0.000402	0.000384	-4%	California Air Resources Board
Solid waste (landfilled waste-in-place)	Per ton	0.253247	0.253247	0%	CalRecycle
Solid waste (waste-to-energy)	Per ton	0.000378	0.000378	0%	CalRecycle
Trolleys	Varies*	0.00466	0.00559	NA	Local Government Operations Protocol

*The units for the 2018 emission factor for local trolleys is in $MTCO_2e$ per mile and the 2021 emission factor is in $MTCO_2e$ per gallon of propane.

GHG Inventory Results

The 2018 and 2021 community-wide GHG inventories assessed the following eight sectors:

- **Energy – Residential built environment:** Electricity and natural gas used in residential buildings. This includes the losses in power between sources of power supply and residential users, known as transmission and distribution losses. Residential electricity is provided by Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E). Natural gas is provided by SoCal Gas.
- **Energy – Commercial/industrial built environment**: Electricity and natural gas used in nonresidential buildings and operations (e.g., industrial, commercial, municipal). This includes the losses in power between sources of power supply and commercial/industrial users, known as transmission and distribution losses. Nonresidential electricity is provided by SCE and natural gas is provided by SoCal Gas.
- **On-road transportation**: On-road vehicle trips on local roads and State highways in the city limits, as informed by the Orange County Transportation Authority's regional travel demand model.[2] Trips that merely pass through the city limits are not included. This sector includes light-duty vehicles (those weighing 8,500 pounds or less, which includes passenger cars and small trucks/vans/SUVs) and heavy-duty vehicles (those weighing more than 8,500 pounds). This sector also includes transit routes in Laguna Beach.
- **Solid waste generation:** Material produced by the community that is deposited in landfills and decompose and produce methane. This sector also includes waste that is burned (waste-to-energy). Solid waste tonnage comes from the City and waste characterization is informed by CalRecycle and the California Air Resources Board.
- **Water:** Energy used to treat and pump water used by residents and workers in Laguna Beach. Water data comes from the two water suppliers for Laguna Beach: Laguna Beach County Water District and South Coast Water District.
- **Wastewater:** Energy used to treat and pump wastewater created by residents and workers in Laguna Beach, along with emissions from the processing of wastewater. Data for this sector comes from the South Orange County Wastewater Authority.
- **Off-road equipment:** The fuel use of portable equipment and vehicles that do not travel on roads (e.g., construction or lawn and garden equipment). Results from this sector were not included in the initial 2018 GHG inventory. They have been retroactively added using the same method as the 2021 inventory, which is informed by the EMFAC model from the California Air Resources Board.

[2] Orange County Transportation Authority. 2016. "OCTAM Transportation Demand Model."

- **Land use and sequestration**: The GHG emissions absorbed and stored in trees and soils (sequestration) or released into the atmosphere from development of previously undeveloped lands (land use). Results from this sector were not included in the initial 2018 GHG inventory. They have been retroactively added using the same method as the 2021 inventory. Data for this sector, which includes acres of developed land, comes from the City of Laguna Beach.

Emissions from wildfires were not included in the inventories as there were no reported wildfires in Laguna Beach during the inventory years.

Sectors for Municipal Operations

The 2018 and 2021 government operations GHG inventories assessed the following seven sectors:

- **Energy:** Electricity and natural gas used to power City operations including the subsectors of buildings and facilities and streetlights and traffic signals.
- **Employee commute:** The total annual miles that City staff drive to get to and from work.
- **Transportation - Transit:** Fuel used by Laguna Beach's City-operated transit operations and trolleys.
- **Transportation - City fleet:** Fuel used by City vehicles.
- **Solid waste:** Material produced by City employees and visitors to City facilities that is deposited into landfills.
- **Water:** Energy used to treat and pump water used by City employees and visitors to City facilities.
- **Wastewater:** Energy used to treat and pump wastewater created by City employees and visitors to City facilities, along with emissions from the processing of wastewater.

Community-Wide GHG Inventory Results

Table B-2 shows the activity data for each sector assessed in the community-wide inventories. Activity data is multiplied by emission factors to calculate total emissions. Changes in emissions between inventories can be due to changes in activity data (or use of a resource) or changes in emission factors.

Table B-2: Summary of Activity Data by Sector, Community-wide GHG Inventory, 2018 and 2021

Sector	Unit	2018	2021	Percentage Change, 2018 - 2021
Energy - Residential built environment electricity use	kWh	84,558,970	79,211,580	-6%
Energy - Residential built environment electricity transmission and distribution losses	kWh	3,899,030	3,485,310	-11%
Energy - Residential built environment natural gas use	Therms	4,351,790	4,919,410	13%
Energy - Commercial/industrial built environment electricity use	kWh	59,971,080	49,827,850	-17%
Energy - Commercial/industrial built environment electricity transmission and distribution losses	kWh	2,746,770	2,192,430	-20%
Energy - Commercial/industrial built environment natural gas use	Therms	1,731,060	1,545,410	-11%
On-road transportation (light-duty vehicles)	Miles	247,970,020	266,013,600	7%
On-road transportation (heavy-duty vehicles)	Miles	9,931,180	13,953,940	41%
Solid waste generation (landfilled)	Tons	32,070	33,230	4%
Solid waste generation (waste-to-energy)	Tons	5	4,520	90,300%
Water	Million Gallons	1,350	1,020	-32%
Wastewater	Million Gallons	590	550	-7%
Off-road equipment	Varies	NA	NA	NA

Note: Totals are rounded to the nearest 10.

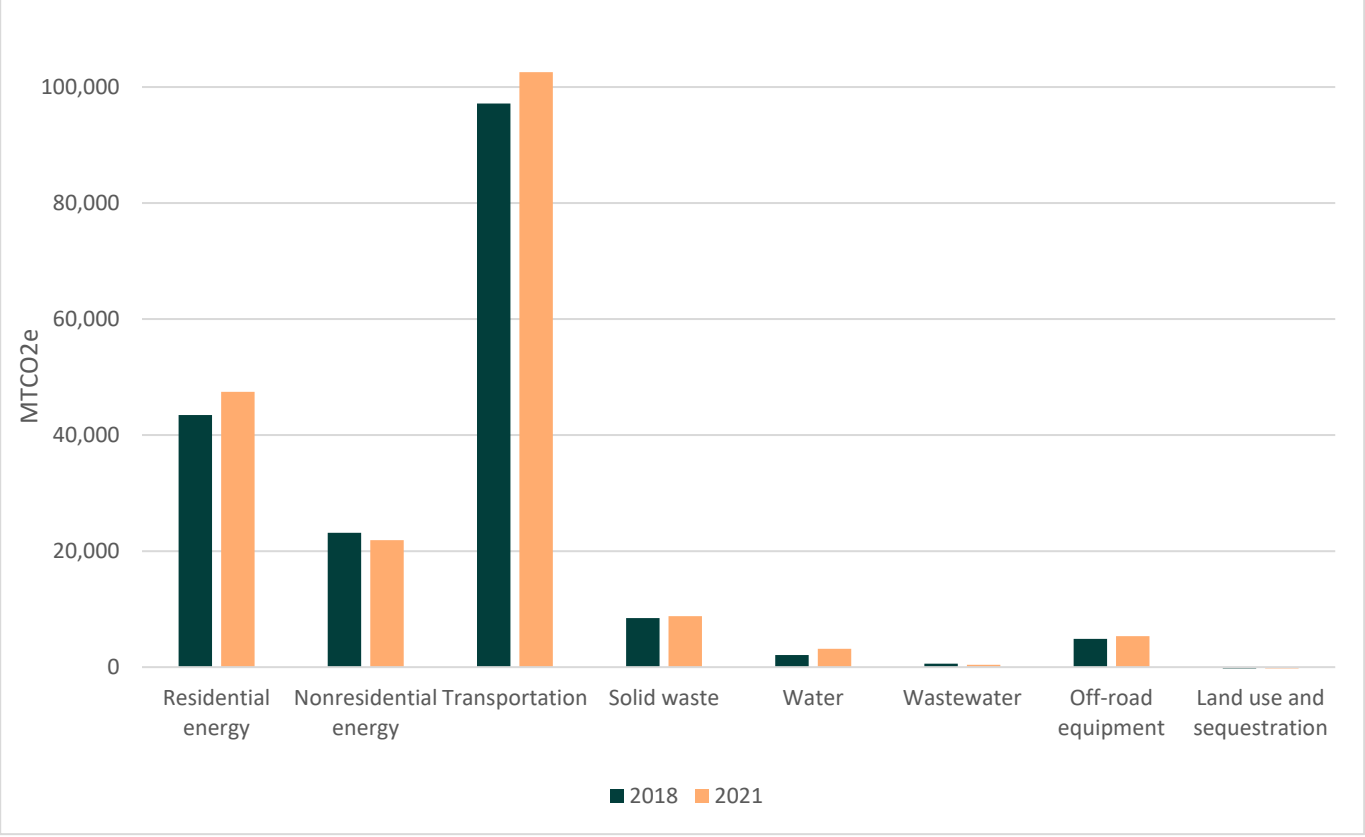
Table B-3 and **Figure B-1** show the total GHG emissions for each sector assessed in the community-wide inventories. The total GHG emissions from the covered activities in the 2021 inventory year were 189,410 $MTCO_2e$, which is a 5 percent increase from the 2018 inventory year which produced 179,610 $MTCO_2e$. Overall, the relative proportion of emissions from the different sectors remained similar from 2018 to 2021 (**Figure B-2**).

Table B-3: Summary of Community-Wide Emissions by Sector, 2018 and 2021

Sector	2018 ($MTCO_2e$)	2021 ($MTCO_2e$)	Percentage Change, 2018 – 2021
Energy - Residential built environment	43,450	47,470	9%
Energy - Commercial/industrial built environment	23,170	21,900	-6%
On-road transportation	97,180	102,570	6%
Solid waste generation	8,470	8,780	4%
Water	2,100	3,160	50%
Wastewater	590	410	-31%
Off-road equipment	4,870	5,340	10%
Land use and sequestration	-220	-220	0%
Total	**179,610**	**189,420**	**5%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Figure B-1: Community-wide GHG Emissions, 2018 and 2021

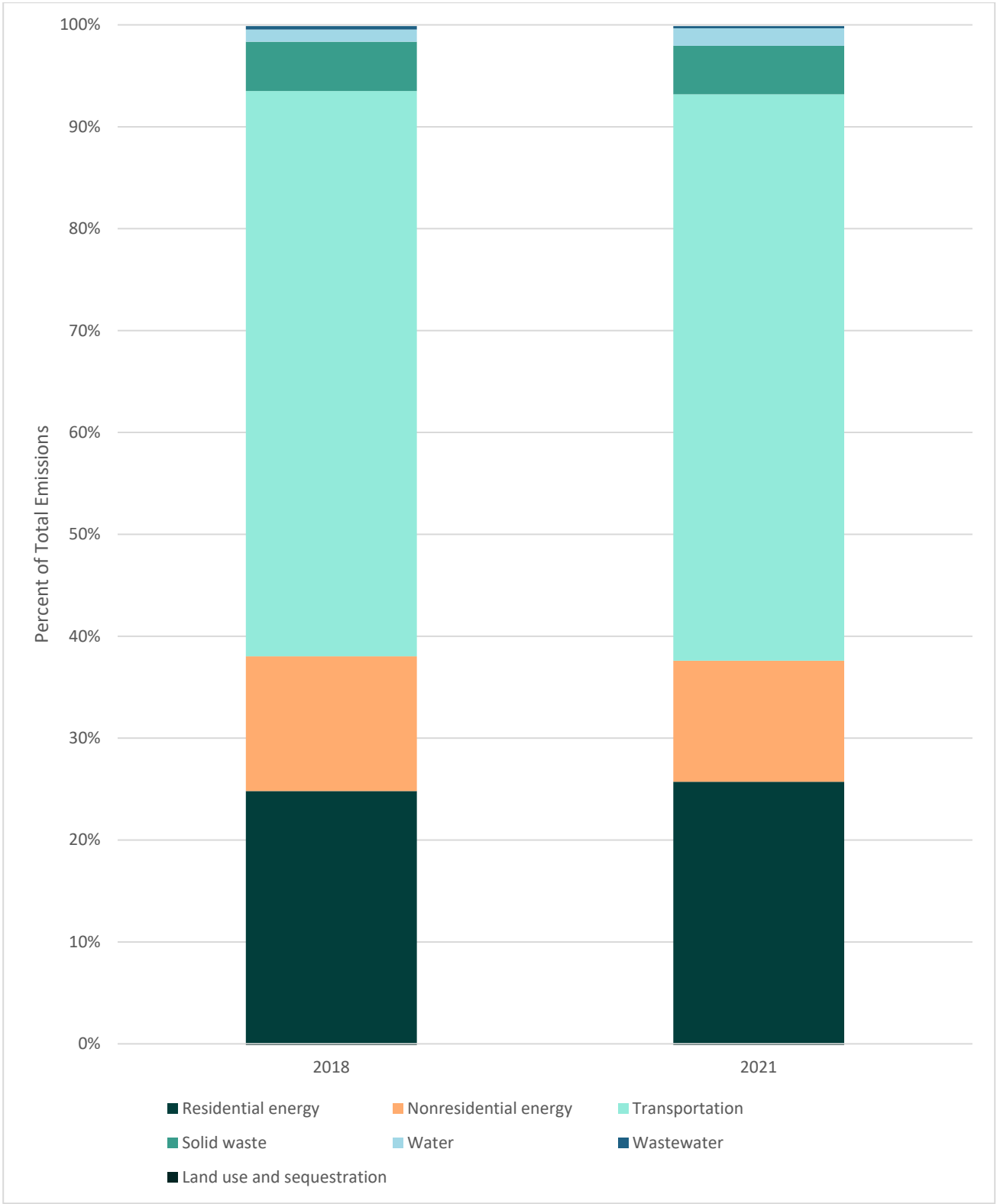


It is common for emissions to vary somewhat between years, typically by 10 percent or less. This can be the result of minor changes in economic conditions, personal behaviors, local climate, and many other factors. Notable trends and findings from the 2018 and 2021 community-wide GHG inventory are noted below.

Key Takeaways

- Emissions from the residential built environment increased by 9 percent between 2018 and 2021, which includes electricity and natural gas use. This is likely due to an increase in natural gas use (13 percent) and higher electricity emission factor for Southern California Edison in 2021 (a 13 percent increase from 2018). Southern California Edison sourced a higher proportion of power from non-renewable sources, mainly natural gas, in 2021 than in 2018.
- Energy use by the commercial/industrial built environment declined 6 percent, which is due to a decrease in electricity and natural gas use. This could be attributed to a decrease in commercial activity as more people worked from home and many businesses maintained limited hours of operation following the COVID-19 shelter-in-place period.
- On-road transportation, which includes personal vehicles, commercial vehicles, regional buses, and local trolleys, remains the largest source of emissions in 2018 and 2021 at 54 percent of total emissions each year. Vehicles miles traveled (VMT) increased 7 percent for light-duty vehicles and 41 percent for heavy-duty vehicles, which includes vehicles over 8,500 pounds. The overall increase in VMT is likely due to a change in methods as each inventory used a different model to estimate VMT. The COVID-19 pandemic likely also played a role in increasing VMT from light-duty vehicles as it resulted in slightly more people opting to drive alone in personal vehicles versus carpooling or taking transit. While VMT for heavy-duty vehicles increased significantly in 2021, the emission factor for both light and heavy-duty vehicles decreased as vehicles became more fuel efficient and electric vehicles adoption increased. Therefore, emissions from transportation overall only increased 6 percent between 2018 and 2021.
- Off-road equipment emissions increased by 10 percent between 2018 and 2021. This is driven by an increase in the subsectors of industrial, lawn and garden, and light commercial equipment, which each increased by approximately 18 percent.
- Emissions from water use increased by 50 percent primarily due to a difference in methods between the 2018 and 2021 inventories, as well as differences in the availability of data**.** Emissions from wastewater activities declined 31 percent during this period, likely due to similar methodological differences and data availability.

Figure B-2: Community-wide GHG Emissions Proportions, 2018 and 2021



Government operations GHG Inventory Results

Table B-4 shows the activity data for each sector assessed in the City of Laguna Beach government operations inventories. This activity data is limited to City facilities, operations such as transit services, and employees such as employee commute and waste produced by employees. Changes in emissions between inventories can be due to changes in activity data or changes in emission factors. For 2018 and 2021, there is no activity data for refrigerant use in City facilities and vehicles. This sector has been omitted from the inventories.

Table B-4: Summary of Activity Data by Sector, Government Operations GHG Inventory, 2018 and 2021

Sector	Unit	2018	2021	Percentage Change, 2018 – 2021
Buildings and facilities electricity use	kWh	1,964,640	1,855,010	-6%
Buildings and facilities natural gas use	therms	58,500	50,020	-14%
Street lights and traffic signals electricity use	kWh	793,050	765,710	-3%
Employee commute trips	miles	391,250	320,760	-18%
Transit – trolleys	gallons	204,860	24,690	-88%
Transit operations diesel use	gallons	NA	960	NA
Transit operations propane use	gallons	NA	10,230	NA
City fleet vehicles	Varies	756,600	111,990	NA
Solid waste from City facilities	tons	280	330	18%
Water delivery facilities electricity use	kWh	1,080,550	1,179,350	9%
Water delivery facilities natural gas use	therms	110	NA	NA
Indirect water treatment	million gallons	40	40	NA
Indirect wastewater treatment	NA	NA	NA	NA
Direct wastewater treatment	NA	NA	NA	NA

Note: Totals are rounded to the nearest 10. The 2021 inventory included activity data for City fleet vehicles use of propane, but this was not included in 2021 data. The 2018 inventory included activity data for off-road vehicles, while the 2021 inventory did not. Activity data for City fleet vehicles in 2018 was in miles, while in 2021 it was in gallons of fuel used.

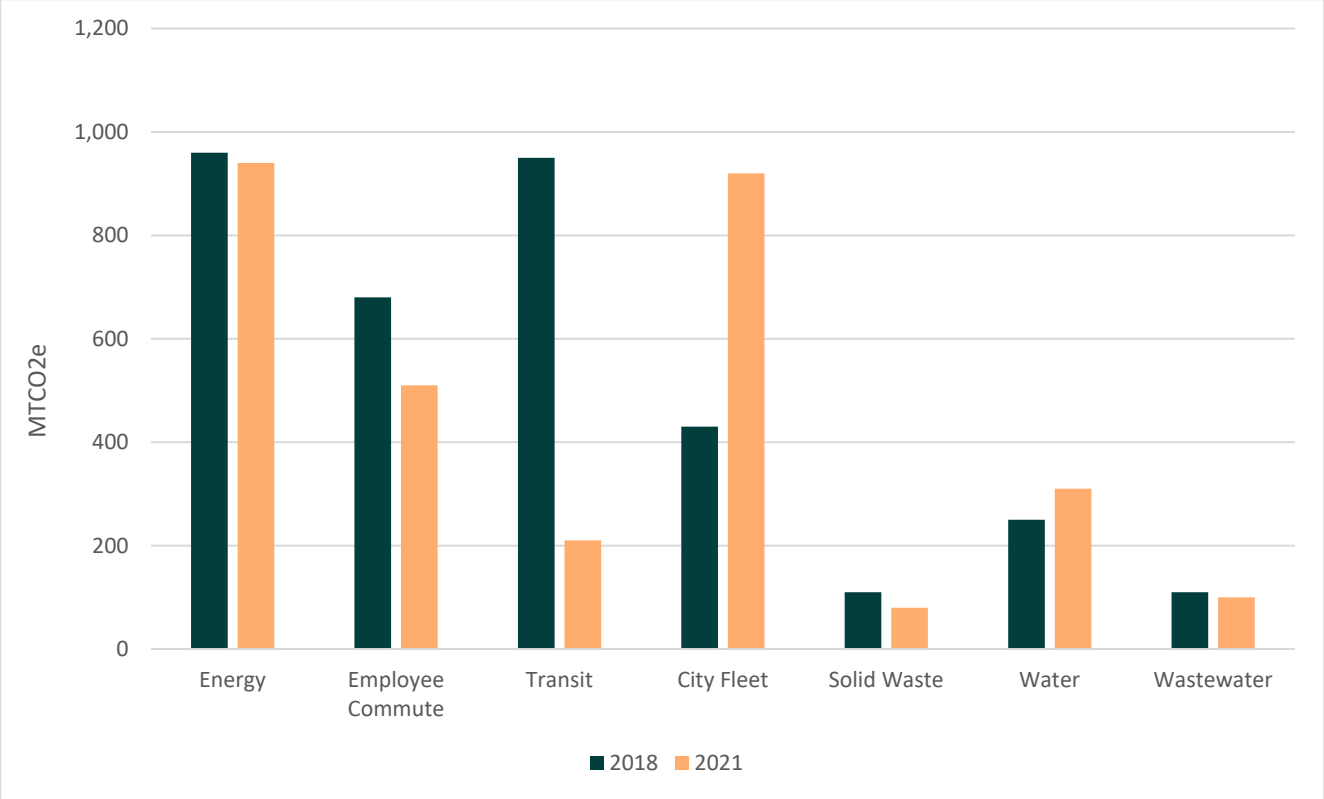
Table B-5 and **Figure B-3** shows the total GHG emissions for each sector assessed in the government operations inventories. The total GHG emissions from the covered activities were 3,480 $MTCO_2e$ in 2018 and 3,070 $MTCO_2e$ in 2021, a 12 percent decline between the two years. The relative proportion of emissions from the different sectors shifted from 2018 to 2021. As shown in **Figure B-4**, emissions from City fleet vehicles made up a larger percentage of emissions in 2021 than in 2018 while emissions from transit reduced in relative proportion from 2018 to 2021.

Table B-5: Summary of Government Operations Emissions by Sector, 2018 and 2021

Sector	2018 ($MTCO_2e$)	2021 ($MTCO_2e$)	Percent Change, 2018-2021
Energy	960	940	-2%
Employee Commute	680	510	-25%
Transit	950	210	-78%
City Fleet	430	920	114%
Solid Waste	110	80	-27%
Water	320	400	25%
Wastewater	20	10	-50%
Total	**3,480**	**3,070**	**-12%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Figure B-3: Laguna Beach Government Operations Emissions, 2018 and 2021



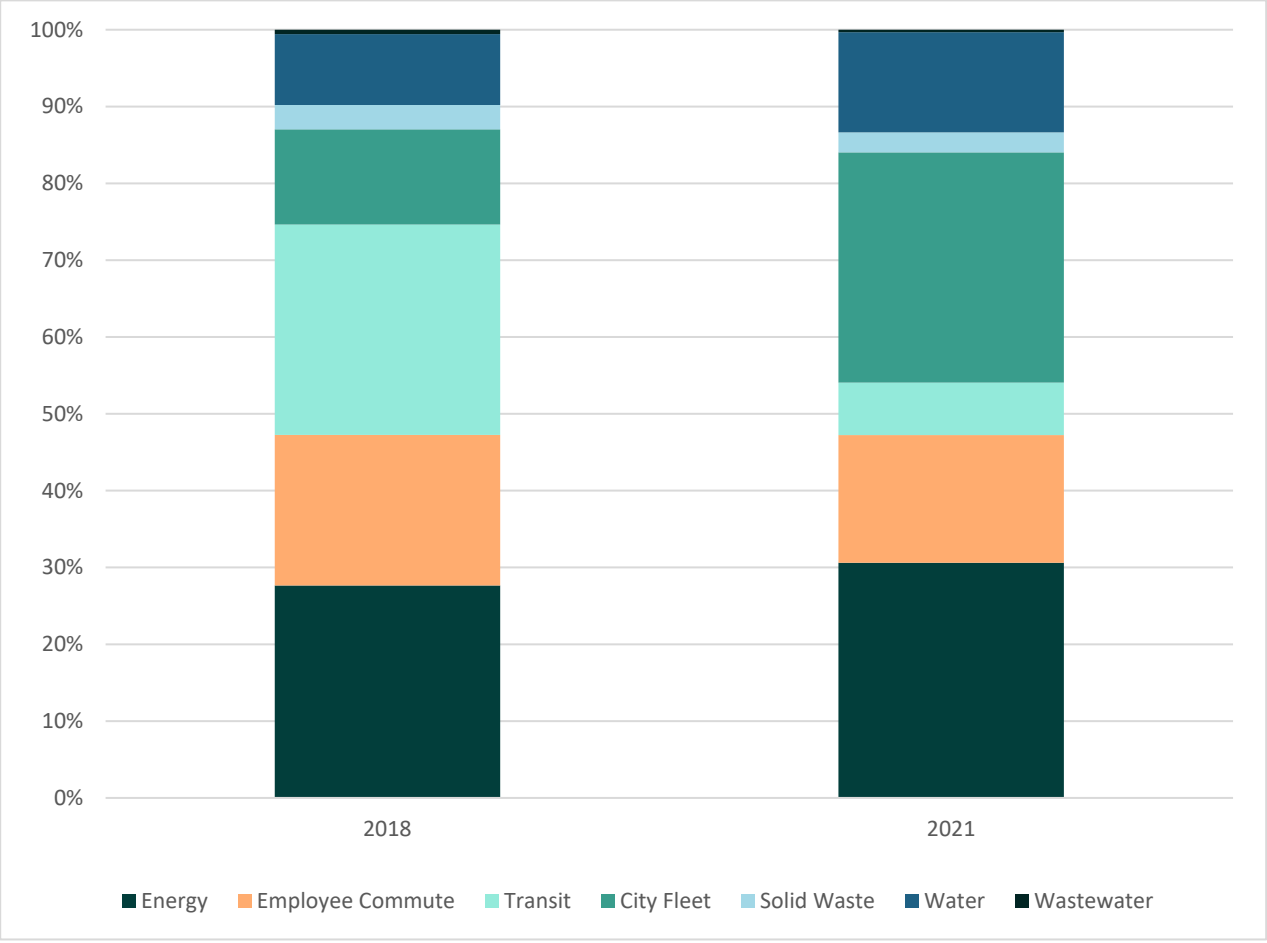
Similar to the community-wide inventory, changes of under 10 percent are to be expected when comparing one year to another. The government operations inventories saw larger changes between 2018 and 2021. The key changes and other notable findings from the 2018 and 2021 government operations inventories are noted below.

Key Takeaways

- Emissions from the employee commute sector decreased 25 percent between 2018 and 2021, which is likely due to a reduction in employees driving to and from work following the COVID-19 pandemic shelter-in-place period.
- Emissions from transit decreased 78 percent, which was driven by a reduction in fuel used for local trolleys. As with emissions from employee commute, this reduction is also likely due to decreased trolley service in the wake of the COVID-19 shelter-in-place period. The City has also transitioned to an on-demand service that uses smaller vehicles since 2018.
- Emissions from City fleet vehicles increased 114 percent, which is likely due to a methodological difference between the 2018 and 2021 inventory preparers.

- Solid waste emissions from City facilities decreased 27 percent. Similar to that of employee commute, this reduction is likely driven by fewer employees working from City facilities following the COVID-19 pandemic shelter-in-place period.
- Emissions from the water sector increased 25 percent, which is driven by an increase in energy used for water treatment and the higher emission factor for Southern California Edison in 2021 versus 2018. Emissions from wastewater declined by 50 percent, although this is primarily a change in methods and a result of the rounding. Both total municipal water use and wastewater generation declined by approximately 7 percent from 2018 and 2021.

Figure B-4: Government Operations GHG Emissions Proportions, 2018 and 2021



Forecast Results

The forecast is Laguna Beach's projection of future community-wide and government operations GHG emissions. It illustrates how emissions are expected to change over time. This is also known as a BAU or worst-case scenario, since it assumes that there is no new action taken to reduce GHG emissions and that each individual Laguna Beach City employee or community member continues to produce the same amount of GHG emissions. A GHG emission forecast is informed by demographic indicators, such as City population, households, and jobs. As the City adds employees and grows in population, the BAU forecast assumes emissions increase proportionally.

Table B-6 lists the demographic indicators used to forecast community-wide GHG emissions. **Table B-7** shows the results of the community-wide GHG emissions forecast. In total, GHG emissions are projected to increase 2 percent from 2021 to 2045. Emissions from all sectors do not change significantly as the population and number of jobs in Laguna Beach are not predicted to increase significantly. Emissions from the residential built environment increase more than other sectors given the predicted increase in households between 2021 and 2045. Population is expected to decline slightly despite the increase in households, due to anticipated reductions in the average household size.

Table B-6: Demographic Indicators, Community-wide GHG Emission Forecast 2021-2045

Indicator	2021	2030	2045	Percentage Change, 2021-2045
Population	24,090	23,810	23,350	-3%
Households	13,000	13,400	14,100	8%
Jobs	13,360	13,360	13,360	0%
Service population (jobs + population)	37,450	37,170	36,710	-2%

Sources: City of Laguna Beach, Southern California Association of Governments, California Department of Finance

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Table B-7:Community-wide GHG Inventory and Forecast, 2021 - 2045

Sector	2021 ($MTCO_2e$)	2030 ($MTCO_2e$)	2045 ($MTCO_2e$)	Percentage Change, 2021-2045
Energy - Commercial/industrial built environment	21,900	21,900	21,900	0%
Land use and sequestration	-220	-220	-220	0%
Off-road equipment	5,330	5,640	5,670	6%
On-road transportation	102,580	102,790	103,140	1%
Energy - Residential built environment	47,470	48,930	51,490	8%
Solid waste generation	8,790	8,730	8,630	-2%
Water	3,160	3,140	3,100	-2%
Wastewater	410	410	410	0%
Total	**189,420**	**191,320**	**194,120**	**2%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

Table 8 lists the demographic indicators used to forecast government operations GHG emissions. **Table 9** shows the results of the government operations GHG emissions forecast. In total, emissions from government operations increased 42 percent from 2021 to 2045 under a business-as-usual scenario, which is driven by an increase in City employees of 59 percent. Emissions from City facilities energy use, employee commute, and the City's vehicle fleet each increase over 50 percent by 2045 if no reduction actions are taken.

Table B-8: Demographic Indicators, Government Operations Forecast, 2021-2045

Indicator	2021	2030	2045	Percentage Change, 2021-2045
City employees	270	340	430	59%
Population	24,090	23,810	23,350	-3%
Service population	37,450	37,170	36,710	-2%

Sources: City of Laguna Beach, Southern California Association of Governments, California Department of Finance
Note: Totals are rounded to the nearest 10.

Table B-9:Government Operations GHG Inventory and Forecast, 2021 – 2045

Sector	2021 ($MTCO_2e$)	2030 ($MTCO_2e$)	2045 ($MTCO_2e$)	Percentage Change, 2021-2045
Energy	940	1,140	1,390	48%
Employee Commute	510	640	810	59%
Transit	207	210	210	2%
City Fleet	920	1,130	1,470	60%
Solid Waste	80	80	80	0%
Water	400	400	390	-3%
Wastewater	10	10	10	0%
Total	**3,070**	**3,610**	**4,360**	**42%**

Note: Totals are rounded to the nearest 10. Totals may not equal the sum of their component rows.

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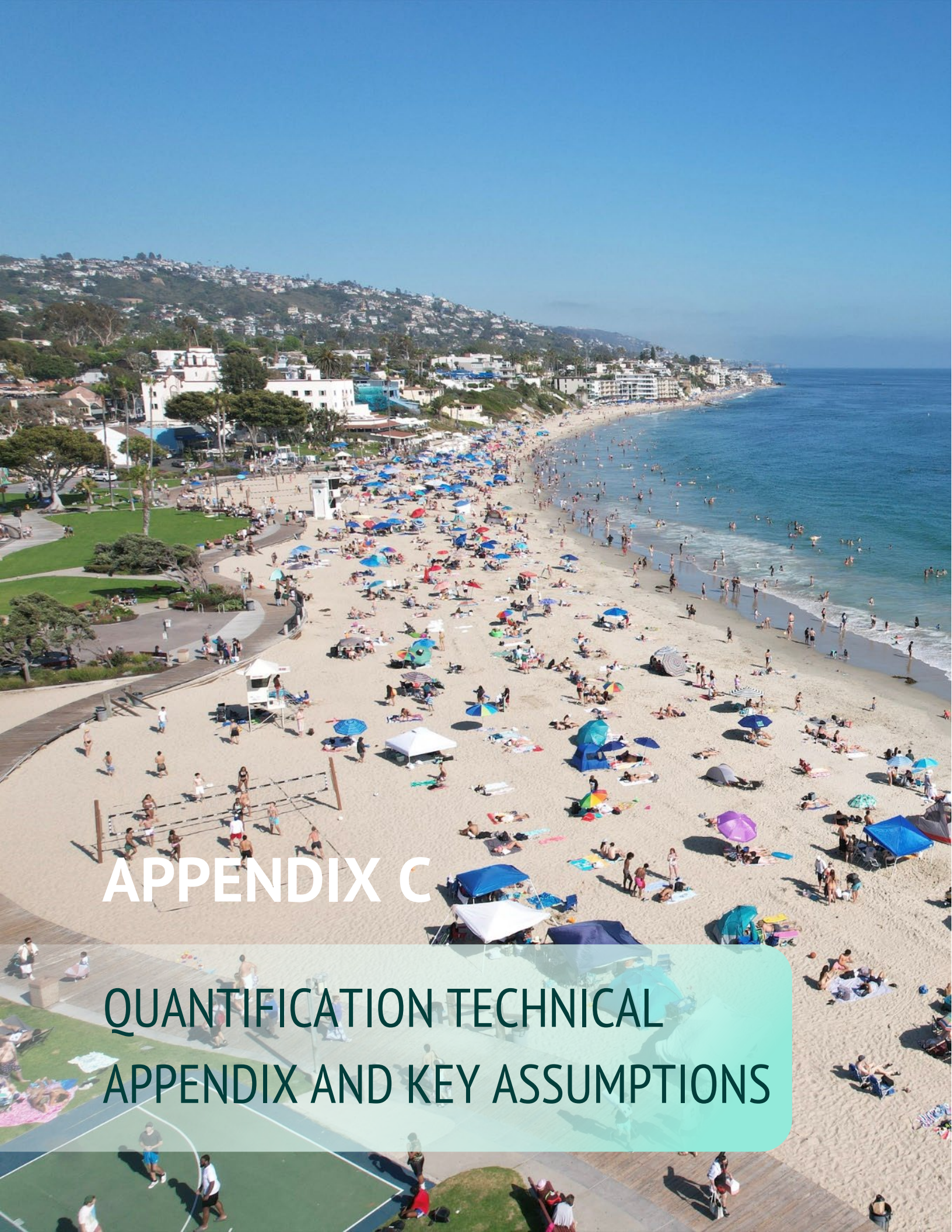

APPENDIX C

QUANTIFICATION TECHNICAL APPENDIX AND KEY ASSUMPTIONS

APPENDIX C: QUANTIFICATION TECHNICAL APPENDIX

This appendix provides the details of the calculations used to determine the greenhouse gas (GHG) emission reductions achieved by existing and planned efforts and the new GHG emission reduction strategies. This includes the data sources, assumptions, and performance metrics used to calculate GHG emission reductions for the Climate Action and Adaptation Plan (CAAP). The sources and metrics are organized by measure and rely on four primary types of data and research: (1) Laguna Beach's GHG emissions inventory and forecast, (2) government agency tools and reports, (3) government agency protocols, and (4) scholarly research.

The baseline GHG emission inventory and forecast serve as the foundation for the quantification of the City's GHG emission-reduction measures. Activity data from the inventory form the basis of measure quantification, including vehicle miles traveled (VMT), kilowatt-hours (kWh) of electricity or therms of natural gas consumed, and tons of waste disposed. Activity data were combined with the performance metrics and indicators identified by the City and consultants. The activity data and performance metrics and indicators were used throughout the quantification process to calculate the emissions reduction benefit of each measure. This approach ensures that Laguna Beach's GHG emissions reductions are tied to the baseline and to future activities occurring in the city.

Emission Factors

Table C-1 lists the emissions factors used to quantify emissions reductions in the CAAP. These emission factors reflect the GHG emission reductions from existing and planned accomplishments, as well as Southern California Edison (SCE), San Diego Gas and

Electric (SDG&E), and SoCal Gas to the extent feasible. They do not reflect the average emission factors with full implementation of this CAAP.

Table C-1: Emissions Coefficients for CAAP Measures

Emission Sector	Unit	2021	2030	2045	Source
Residential electricity (SCE)	MTCO2e/kWh	0.000229	0.000200	0.000000	Southern California Edison
Residential electricity (SDG&E)	MTCO2e/kWh	0.000229	0.000217	0.000000	San Diego Gas & Electric
Residential electricity T&D losses	MTCO2e/kWh	0.000258	0.000202	0.000000	Southern California Edison, San Diego Gas & Electric
Nonresidential electricity (SCE)	MTCO2e/kWh	0.000263	0.000200	0.000000	Southern California Edison
Nonresidential electricity T&D losses	MTCO2e/kWh	0.000265	0.000201	0.000000	Southern California Edison
Natural gas (SoCal Gas)	MTCO2e/therm	0.005312	0.005311	0.005311	US Community Protocol
On-road transportation light-duty gasoline	MTCO2e/VMT	0.000341	0.000287	0.000257	California Air Resources Board
On-road transportation light-duty diesel	MTCO2e/VMT	0.000369	0.000341	0.000302	California Air Resources Board
On-road transportation light-duty natural gas	MTCO2e/VMT	N/A	0.000000	0.000000	California Air Resources Board
On-road transportation light-duty plug-in hybrid	MTCO2e/VMT	0.000153	0.000126	0.000117	California Air Resources Board
On-road transportation light-duty electric	MTCO2e/VMT	0.000000	0.000000	0.000000	California Air Resources Board
On-road transportation heavy-duty gasoline	MTCO2e/VMT	0.000894	0.000731	0.000618	California Air Resources Board
On-road transportation heavy-duty diesel	MTCO2e/VMT	0.001160	0.001035	0.001007	California Air Resources Board
On-road transportation heavy-duty natural gas	MTCO2e/VMT	0.002175	0.001973	0.001118	California Air Resources Board

Emission Sector	Unit	2021	2030	2045	Source
On-road transportation heavy-duty electric	MTCO2e/VMT	0.000000	0.000000	0.000000	California Air Resources Board
Solid waste (landfilled)	MTCO2e/ton	0.253385	0.219286	0.219450	California Air Resources Board Landfill Emissions Tool

These emissions coefficients were calculated as follows, using data from the GHG inventory and forecast:

- $MTCO_2e$ per kWh: Divide the sum of the emissions for residential and commercial electricity use by the sum of the kWh for these two sources, for each electricity provider.
- $MTCO_2e$ per therm: Divide the sum of the emissions from residential and commercial natural gas by the sum of the therms used by these two sources.
- $MTCO_2e$ per mile driven: Divide the emissions from on-road transportation by the number of on-road VMT.
- $MTCO_2e$ per ton of waste: Divide the sum of the emissions from landfilled waste and waste in place by the sum of the tons of waste in these sources.

Technical Data for Existing and Planned Local and Regional Activities

Data sources, methods, and assumptions for the quantification of the existing and planned local and regional activities are provided below. Note that some existing and planned local activities may not have assumptions and/or performance metrics. The GHG reductions shown for existing and planned local and regional activities are only in addition to any reductions achieved by existing or planned State efforts.

Converting Streetlights to LEDs

Activity and GHG Reduction

Emissions Reduction/Energy Savings	2030	2045
Emissions reduction (MTCO2e)	20	0
Energy savings (kWh)	96,780	96,780

GHG Method

The project team counted the number of streetlights that had been converted to LED bulbs and the associated kWh savings per month. Then the team applied the appropriate emissions factor to the electricity savings figures to determine the reduction in GHG emissions.

Sources

Southern California Edison. 2024. 2021 Power Content Label: Southern California Edison. https://www.sce.com/sites/default/files/custom-files/Web%20files/2021%20Power%20Content%20Label.pdf.

City of Laguna Beach. Response to data collection questionnaire. 2024.

Converting City Council Chambers to LEDs

Activity and GHG Reduction

Emissions Reduction/Energy Savings	2030	2045
Emissions reduction (MTCO2e)	0.31	0
Energy savings (kWh)	1,570	1,570

GHG Method

The project team collected the associated kWh savings per year due to converting the lighting in City Council Chambers to LED bulbs. Then the team applied the appropriate emissions factor to the electricity savings figures to determine the reduction in GHG emissions.

Sources

Southern California Edison. 2024. 2021 Power Content Label: Southern California Edison. https://www.sce.com/sites/default/files/custom-files/Web%20files/2021%20Power%20Content%20Label.pdf.

City of Laguna Beach. Response to data collection questionnaire. 2024.

Street Trees

Activity and GHG Reduction

Emissions Reduction	2030	2045
Emissions reduction ($MTCO_2e$)	12	12

GHG Method

The project team counted the number of new trees that have been planted along Laguna Beach streets and in parks (public trees). Then the team used the recommended tree list for Laguna Beach to make assumptions on the type of trees that were planted. Finally, the team used the US Forest Service's i-Tree tool to estimate the amount of carbon sequestered by each tree.

Sources

United States Forest Service. 2024. i-Tree Planting Calculator. https://planting.itreetools.org/app/report/.

City of Laguna Beach. Response to data collection questionnaire. 2024.

Bike Lanes

Activity and GHG Reduction

Emissions/VMT Reduction	2030	2045
Emissions reduction (MTCO2e)	4	3
VMT reduction	14,040	15,440

GHG Method

The project team counted the increase in bicycle lanes (miles) planned for 2024 and beyond and the number of bicycle lanes that have been constructed since the 2021 inventory. The team used this information and the proposed methodology from the California Air Pollution Control Officers Association to calculate the percentage decrease in VMT associated with an increase in bicycle lanes and applied the VMT emissions factor for personal gasoline-powered vehicles to determine the GHG reductions associated with this existing accomplishment.

Sources

California Air Pollution Control Officers Association. 2022. "Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity."

City of Laguna Beach. Response to data collection questionnaire. 2024.

Fleet Electrification and Electric Vehicle Charging Master Plan

Activity and GHG Reduction

Emissions/Fuel Reduction	2030	2045
Emissions reduction (MTCO2e)	730	950
Gasoline fuel reduction (gallons)	58,880	71,690
Diesel fuel reduction (gallons)	23,530	34,360
VMT reduction	552,980	613,980

GHG Method

The project team reviewed the Fleet Electrification and Electric Vehicle Charging Master Plan Final Report (2023) to collect the number of City vehicles that could be converted to electric models. Then the team calculated the fuel savings based on the average fuel use (gasoline, diesel, and propane) of existing City vehicles. The team multiplied the fuel savings by the emission factors for gasoline- and diesel-powered vehicles to determine the GHG emission savings should the plan be implemented. Finally, the team determined the VMT savings by multiplying the fuel savings percentage by the total miles for each vehicle category in the City's operational fleet.

Sources

ICF International and City of Laguna Beach. 2023. "City of Laguna Beach Fleet Electrification and Electric Vehicle Charging Master Plan—Final Report."

Technical Data for Quantified Strategies

Data sources, methods, and assumptions for the quantification of CAAP measures are provided below. GHG emission reductions are shown for two scenarios: if the City joins a Community Choice Aggregator (CCA) to serve as their default electricity supplier, and if the City does not join a CCA and continues to receive all of its electricity from SCE and SDG&E. For some strategies, there is no difference in the 2030 GHG emission reductions with a CCA compared to without. Given the State's requirement that 100 percent of electricity be from renewable sources by 2045 under the Renewables Portfolio Standard (Senate Bill 100), some strategies will show no GHG emission savings in 2045. This is because the power supply is expected to be carbon-free and activities that use electricity will therefore have no associated GHG emissions.

Strategy 2: Facilitate the private-sector adoption of zero-emission vehicles.

Assumptions

Factor	2030	2045
Light-duty electric vehicle (EV) adoption rate	25%	80%
Heavy-duty zero-emission vehicle (ZEV) adoption rate	10%	70%

GHG Reductions

Factor	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	8,980	57,220	9,610	57,220

Activity Reductions

Metric	2030	2045
VMT	-16,277,200	-83,056,680

Performance Indicators

Indicator	2030	2045
Number of light-duty EVs registered in Laguna Beach	4,970	15,900
New EV chargers installed citywide	50	50

GHG Method

The project team collected information on the number of public EV chargers in Laguna Beach and used factors about the average charging use of public EV chargers to estimate how many VMT of EV use the public chargers in the community support annually. The project team then estimated the electricity use from these EV chargers.

Next, the team applied the appropriate emissions factors to the VMT and electricity use figures and took the difference between the two as the net reduction in GHG emissions.

Sources

California Air Resources Board. 2024. "EMFAC2021 Web Database." https://arb.ca.gov/emfac/.

California Department of Motor Vehicles. 2021. "Vehicle registration data." Retrieved from https://www.dmv.ca.gov/.

Strategy 3: Increase residential energy efficiency in new and existing homes.

Assumptions

Assumptions	2030	2045
Percentage of existing residential buildings receiving standard efficiency retrofits	15%	40%
Cumulative percentage of existing homes upgrading to Title 24 Standards	20%	40%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	7,530	11,260	6,970	11,260

Activity Reductions

Metric	2030	2045
kWh	14,645,500	27,278,790
Therms	859,740	2,119,900

Performance Indicators

Performance Indicators	2030	2045
Residential units receiving standard energy-efficiency retrofits	1,950	5,210
Residential units receiving Title 24 energy-efficiency retrofits	2,610	5,210

GHG Method

The team collected the number of single- and multifamily housing units from the City's General Plan Housing Element. The project team looked at reports from retrofit programs throughout California to identify the typical electricity and natural gas savings from single-family and multifamily home retrofits and applied these savings to the energy use patterns of residences in Laguna Beach. The team next reviewed current and projected future Title 24 standards against the current energy performance of Laguna Beach homes and projections of future Laguna Beach Title 24 retrofits to determine the typical electricity and natural gas savings. The team then applied the appropriate emissions factors to the energy savings estimates to determine GHG reductions.

Sources

California Energy Commission. 2024. *Reach Code Paths*. https://localenergycodes.com/content/reach-codes/building-efficiency-renewables.

City of Laguna Beach. 2023. *City of Laguna Beach Housing Element*. https://www.lagunabeachcity.net/home/showpublisheddocument/18984/638538895028030000.

California Energy Commission. 2022. *Title 24 Building Energy Efficiency Standards*. California Code of Regulations, Title 24, Part 6.

Pacific Northwest National Laboratory. 2011. "Advanced Energy Retrofit Guides: Office Buildings." https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf.

Pacific Northwest National Laboratory. 2011. "Advanced Energy Retrofit Guides: Retail Buildings." https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20814.pdf.

Strategy 4: Construct new, and retrofit existing, residential buildings to use zero-carbon energy sources.

Assumptions

Assumptions	2030	2045
Cumulative percentage of residential new construction influenced by EDR code (once implemented):	95%	95%
Year EDR code is first implemented	2026	2026
Cumulative percentage of homes installing electric water heaters	15%	80%
Cumulative percentage of homes installing electric space heaters	15%	80%
Cumulative percentage of homes installing electric cooking appliances	5%	50%
Cumulative percentage of homes installing electric clothes drying appliances	10%	80%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	2,980	12,170	3,040	12,170

Activity Reductions

Metric	2030	2045
kWh	-108,560	-523,470
Therms	615,710	2,291,940

Performance Indicators

Indicator	2030	2045
Number of new residential units built to EDR code	350	1020
Residential units installing electric water heaters	1,950	10,420
Residential units installing electric space heaters	1,950	10,420
Residential units installing electric cooking appliances	650	6,510
Residential units installing electric clothes drying appliances	1,300	10,420

GHG Method

The project team obtained data on the number of housing units from the City of Laguna Beach General Plan Housing Element and used this data to estimate the number of new homes and those undergoing retrofits based on recent year City permitting data for retrofit activities, that would be impacted by an all-electric new construction or renovation reach code. The team identified the average amount of natural gas used per household and data on the equivalent amount of electricity that would be required in a mostly electric or all-electric version of similar buildings. The team applied this information to the projected number of new buildings built to estimate the projected reduction in natural gas consumption and the projected increase in electricity consumption resulting from the policy. The team then applied the emission factor for avoided natural gas consumption to estimate the emissions reduction associated with reduced natural gas consumption, and the emission factor for electricity use to estimate the emissions increase associated with increased electricity consumption. The net resulting emissions are the estimated emissions avoided from the policy.

Sources

California Energy Commission. 2006. *California Commercial End-Use Survey*. https://www.energy.ca.gov/data-reports/surveys/california-commercial-end-use-survey/2006-california-commercial-end-use-survey.

California Energy Commission. 2009. *2009 California Residential Appliance Saturation Study*. https://www.energy.ca.gov/data-reports/surveys/2019-residential-appliance-saturation-study/2009-and-2003-residential.

Strategy 5: Accelerate the electrification of landscaping, construction, and other outdoor equipment.

Assumptions

Assumption	2030	2045
Percentage of landscaping equipment fuel use converted to electric	30%	75%
Percentage of construction equipment fuel use converted to electric	25%	75%
Percentage of all other off-road equipment fuel converted to electric	20%	60%
Percentage of landscaping equipment fuel use converted to electric	30%	75%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	1,470	7,140	1,620	7,140

Activity Reductions

Metric	2030	2045
kWh	-4,371,910	-8,827,740

Performance Indicators

Indicator	2030	2045
Reduction in gallons of gasoline used in landscaping equipment	27,761	69,403
Reduction in gallons of diesel used in landscaping equipment	525	1,312
Reduction in gallons of gasoline used in construction equipment	1,903	5,709
Reduction in gallons of diesel used in construction equipment	27,947	83,842

GHG Methods

The team used data from the California Air Resources Board and the inventory to identify the reduction in direct emissions per percent of landscaping equipment and non-landscaping off-road equipment converted to electricity traded in. The team then estimated the decrease in gasoline and diesel fuel resulting from this effort and used information about energy density to determine the increase in electricity needs. The team estimated the GHG increase from greater electricity needs and subtracted this from the emission reduction from decreased fuel use to determine the net GHG reduction.

Sources

California Air Resources Board. 2024. "EMFAC2021 Web Database." https://arb.ca.gov/emfac/.

Argonne National Laboratory. (n.d.). *The GREET Model (Greenhouse gases, Regulated Emissions, and Energy use in Technologies)*. Argonne National Laboratory. https://greet.es.anl.gov/.

Strategy 6: Increase energy efficiency in existing and new nonresidential buildings, including retail, hotels, offices, and municipal facilities.

Assumptions

Assumption	2030	2045
Cumulative percentage of existing businesses conducting standard retrofits	20%	45%
Cumulative percentage of existing businesses retrofitting to current Title 24 standards	25%	50%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	4,090	4,010	3,620	4,010

Activity Reductions

Metric	2030	2045
kWh	12,853,850	31,754,480
Therms	283,820	754,630

Performance Indicators

Indicator	2030	2045
Number of businesses undergoing standard retrofits	210	480
Number of businesses upgraded to Title 24 standards	270	540

GHG Method

The project team looked at reports of the energy savings from different types of nonresidential energy efficiency retrofits to identify the typical electricity and natural gas savings from these activities and applied these savings to the energy use patterns of Laguna Beach businesses. The team next reviewed current and projected future Title 24 standards against the current energy performance of Laguna Beach businesses and projections of future Laguna Beach Title 24 retrofits to determine the typical electricity and natural gas savings. The team then applied the appropriate emissions factors to the energy savings estimates to determine GHG reductions.

Sources

U.S. Census Bureau. 2021. *Table EC1700BASIC: Basic Economic Census Data for California.* American Economic Census. Retrieved from https://www.census.gov/.

United States Department of Energy. 2011. *Building Energy Programs: Advanced Energy Retrofit Guides*. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-20761.pdf.

California Energy Commission. 2022. *Title 24 Building Energy Efficiency Standards*. California Code of Regulations, Title 24, Part 6.

Strategy 7: Construct new, and retrofit existing, nonresidential buildings to use zero-carbon energy sources.

Assumptions

Assumption	2030	2045
Cumulative percentage of businesses installing electric water heaters	20%	85%
Cumulative percentage of businesses installing electric space heaters	20%	85%
Cumulative percentage of businesses installing electric cooking appliances	15%	60%
Cumulative percentage of existing businesses eligible for electric appliances	80%	90%
Cumulative percentage of nonresidential buildings influenced by EDR code (once implemented):	80%	90%
Year EDR code is first implemented	2026	2026

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	10,090	2,880	1,120	2,880

Activity Reductions

Metric	2030	2045
kWh	-846,180	-1,929,870
Therms	237,350	541,320

Performance Indicators

Indicator	2030	2045
Number of businesses installing electric water heaters	240	630
Number of businesses installing electric space heaters	240	630
Number of businesses installing electric cooking appliances	160	640

GHG Method

The project team obtained data on the number of businesses from the US Census Bureau, and City permit data on the number of businesses that undergo retrofits, and used this data to estimate the number of new nonresidential buildings and those undergoing retrofits that would be impacted by an all-electric new construction or renovation reach code. The team identified the average amount of natural gas used per nonresidential building square foot and data on the equivalent amount of electricity that would be required in a mostly electric or all-electric version of similar buildings. The team applied this information to the projected number of new buildings built to estimate the projected reduction in natural gas consumption and the projected increase in electricity consumption resulting from the policy. The team then applied the emission factor for avoided natural gas consumption to estimate the emissions reduction associated with reduced natural gas consumption, and the emission factor for electricity use to estimate the emissions increase associated with increased electricity consumption. The net resulting emissions is the estimated emissions avoided from the policy.

Sources

California Energy Commission. 2006. *California Commercial End-Use Survey*. https://www.energy.ca.gov/data-reports/surveys/california-commercial-end-use-survey/2006-california-commercial-end-use-survey.

California Energy Commission. 2009. *2009 California Residential Appliance Saturation Study*. https://www.energy.ca.gov/data-reports/surveys/2019-residential-appliance-saturation-study/2009-and-2003-residential.

Strategy 8: Accelerate the transition to renewable, resilient, and efficient power sources across governments.

Assumptions

Assumption	2030	2045
Percentage of existing homes installing solar energy systems	20%	35%
Percentage of new homes installing battery storage systems	40%	70%
Percentage of existing businesses installing solar energy systems	5%	10%
Implementation of Microgrid Resiliency Plan	75%	100%
CCA renewable energy mix	80%	100%
Percentage of homes enrolling in CCA	95%	98%
Percentage of businesses enrolling in CCA	90%	95%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	5,740	0	9,930	0

Activity Reductions

Factor	2030	2045
kWh	28,408,410	57,124,560

Performance Indicators

Indicator	2030	2045
Number of existing homes installing solar energy systems	2,610	4,560
Number of new homes with battery storage systems	150	750
Number of existing businesses installing solar energy systems	50	110

GHG Method

The project team obtained data on the number of housing units from the City of Laguna Beach General Plan Housing Element and the number of businesses from the US Census Bureau and used this data to estimate the number of homes and nonresidential buildings installing solar energy systems and/or battery storage systems. For solar energy systems, the project team identified the number of existing homes in Laguna Beach that could be projected to have a solar energy system. Using data from the National Renewable Energy Laboratory, the team identified how much electricity these solar energy systems could generate annually and applied the community-wide electricity factor to identify electricity savings. For battery systems, the team identified the number of new and existing homes installing solar energy systems and determined the number of these homes that could install a battery energy system. Assuming that battery systems fully charge and discharge once a day, the team identified how much additional renewable energy storage capacity would be enabled by the batteries. The project team then again applied the community-wide electricity factor to identify electricity savings. The team also applied the energy savings from implementing the City of Laguna Beach Climate Action and Adaptation Plan Microgrid Resiliency Plan on select City-owned buildings. Finally, the team estimated the total energy savings if the City were to join a Community Choice Aggregator to procure electricity with an assumed renewable electricity percentage of 60 percent in 2030 and 100 percent in 2045.

Sources

National Renewable Energy Laboratory. n.d. “PVWatts Calculator.” https://pvwatts.nrel.gov/.

City of Laguna Beach. 2024. *City of Laguna Beach Climate Action and Adaptation Plan Microgrid Resiliency Plan*.

Strategy 9: Provide sustainable transportation alternatives for residents to reduce the number of home-based vehicle trips.

Assumptions

Assumption	2030	2045
Percentage of transit service extension	10%	20%
Percentage of homes participating in community-based travel	5%	5%
Number of bike facilities installed citywide	5	10

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	120	200	120	200

Activity Reductions

Factor	2030	2045
VMT	410,780	779,710

Performance Indicators

Indicator	2030	2045
Number of bike facilities installed citywide	5	10
Number of homes participating in community-based travel	670	705

GHG Method

The project team used guidance from the California Air Pollution Control Officers Association to determine the VMT displaced by bicycles if bike facilities are added to the community. For an increase in transit service and transit frequency, the project

team multiplied a factor for elasticity of transit ridership with respect to frequency of service by the existing mode share of transit ridership and personal vehicle usage to determine the displacement of VMT to transit ridership. For reductions in VMT due to community-based travel planning (CBTP), the project team multiplied the assumed proportion of homes targeted by CBTP by an estimate of the number of residents that actually participate in CBTP, an estimate of the percentage reduction in vehicle trips, and an adjustment factor for vehicle trips to VMT. For each of the VMT reductions due to measure implementation, the project team converted the reduction in VMT to GHG emissions using the emission factor for light-duty passenger vehicles in Orange County.

Sources

California Air Pollution Control Officers Association. 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.

California Air Resources Board. 2024. "EMFAC2021 Web Database." https://arb.ca.gov/emfac/.

Strategy 10: Partner with employers to promote sustainable transportation alternatives for commute trips.

Assumptions

Assumption	2030	2045
Percentage of employees eligible for TDM program	2.5%	5%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	260	450	260	450

Activity Reductions

Factor	2030	2045
VMT	876,710	1,775,300

Performance Indicators

Indicator	2030	2045
Number of employees participating in TDM program	300	600

TDM = transportation demand management

GHG Method

The project team multiplied the proportion of employees assumed to participate in a transportation demand management (TDM) program by a factor for the percentage reduction in vehicle mode share of employee commute trips and an adjustment factor for vehicle trips to VMT to determine the VMT reduction. For the VMT reductions due to measure implementation, the project team converted the reduction in VMT to GHG emissions using the emission factor for light-duty passenger vehicles in Orange County.

Sources

California Air Pollution Control Officers Association. 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.

California Air Resources Board. 2024. "EMFAC2021 Web Database". https://arb.ca.gov/emfac/.

Strategy 11: Encourage visitors to use sustainable transportation alternatives to get to/from Laguna Beach and reduce the number of visitor trips in the city.

Assumptions

Assumption	2030	2045
Percentage Park-and-Ride service extension	10%	20%
Additional miles of bikeways	14	16

GHG Reductions

Emission	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	70	60	70	60

Activity Reductions

Factor	2030	2045
VMT	236,590	253,710

Performance Indicators

Indicator	2030	2045
Additional Park-and-Ride parking spaces provided	18	36
Additional miles of bikeways	14	16

GHG Method

To determine VMT reductions from additional Park-and-Ride spots near Laguna Beach local trolley stops, the project team multiplied the assumed increase in number of parking spots by the average trip length to and from the downtown. To determine the

VMT reductions from additional miles of bike lanes, the project team multiplied the assumed increase in bicycle lanes in the community, the existing mode share percentage of bicycles, the average one-way bike trip in the community, and a factor for the elasticity of bike commuters with respect to bikeway miles per population of 10,000 . They then compared that to the existing mode share percentage of vehicles and average one-way vehicle trip. For the VMT reductions due to measure implementation, the project team converted the reduction in VMT to GHG emissions using the emission factor for light-duty passenger vehicles in Orange County.

Sources

California Air Pollution Control Officers Association. 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.

California Air Resources Board. 2024. "EMFAC2021 Web Database". https://arb.ca.gov/emfac/.

Strategy 12: Enhance the City's built environment and road infrastructure to support VMT reduction goals.

Assumptions

Assumption	2030	2045
Miles of new sidewalk	2.5	5

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	70	120	70	120

Activity Reductions

Factor	2030	2045
VMT	224,990	459,160

Performance Indicators

Indicator	2030	2045
Miles of new sidewalk	2.5	5

GHG Method

To determine VMT reductions for an increase in sidewalks, the project team multiplied the existing VMT by a factor for the elasticity of VMT with respect to the ratio of sidewalks-to-streets and the proposed volume of new sidewalks. For the VMT reductions due to measure implementation, the project team converted the reduction in VMT to GHG emissions using the emission factor for light-duty passenger vehicles in Orange County.

Sources

California Air Pollution Control Officers Association. 2021. Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity.

California Air Resources Board. 2024. "EMFAC2021 Web Database". https://arb.ca.gov/emfac/.

Strategy 13: Accelerate the public-sector transition to zero-emission vehicles.

Assumptions

Assumption	2030	2045
Percentage of City fleet gasoline use transitioned to EVs	84%	92%
Percentage of City fleet diesel use transitioned to EVs	84%	98%
Percentage of trolleys transitioned to EVs	25%	100%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	130	1,140	240	1,140

Activity Reductions

Factor	2030	2045
VMT	-3,170,040	-4,787,450
Gasoline (gallons)	59,610	73,990
Diesel (gallons)	23,250	33,150
Propane (gallons)	5,070	32,550

Performance Indicators

Indicator	2030	2045
Gasoline use with EV plan (gallons)	11,354	6,434
Diesel use with EV plan (gallons)	4,362	815
Propane use with EV plan (gallons)	15,218	0

GHG Method

The project team calculated the VMT and fuel savings based on the projections of the *EV Fleet and Charging Station Master Plan*, using the assumed percentage reduction in fuel use as stated in the plan. The team applied this percentage reduction to the existing volume of fuel use to determine the fuel savings and then calculated the associated GHG emissions savings.

Sources

California Air Resources Board. 2024. "EMFAC2021 Web Database." https://arb.ca.gov/emfac/.

City of Laguna Beach. 2023. *EV Fleet and Charging Station Master Plan*. Laguna Beach, CA: City of Laguna Beach.

Strategy 14: Reduce the amount of solid waste sent to landfills.

Assumptions

Assumption	2030	2045
Reduction in waste sent to landfill from City facilities	30%	70%
Reduction in construction and demolition waste	5%	10%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	40	80	40	80

Activity Reductions

Factor	2030	2045
Tons	280	590

Performance Indicators

Indicator	2030	2045
Tons of municipal solid waste saved	99	224
Tons of construction and demolition waste saved	183	366

GHG Method

The project team looked at statewide waste characterization studies to determine the amount of materials being produced in Laguna Beach that could not be recycled or composted (including construction and demolition waste) and used technical studies about waste characterization to determine the GHG emissions associated with a ton of this waste material. The project team then applied an assumed reduction in waste from City facilities and a reduction in construction and demolition waste sent to landfills to identify the total GHG savings.

Sources

California Air Resources Board. 2011. Landfill Emissions Tool version 1.3. https://ww3.arb.ca.gov/cc/landfills/landfills.htm.

California Department of Resources Recycling and Recovery. 2020. *2018 Disposal-Facility-Based Characterization of Solid Waste in California.* https://www2.calrecycle.ca.gov/Publications/Details/1666.

Strategy 15: Reduce potable water use in buildings and urban landscapes.

Assumptions

Assumption	2030	2045
Reduction in total outdoor water use	10%	50%
Percentage of existing homes and businesses retrofitting water fixtures	10%	25%
Percentage of new homes and businesses using water-efficient fixtures	100%	100%
Percentage of buildings using rainwater catchment	5%	15%

GHG Reductions

Emissions	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	300	80	250	80

Activity Reductions

Factor	2030	2045
kWh	864,580	4,548,000

Performance Indicators

Indicator	2030	2045
Reduction in outdoor water use due to turf replacement (MG)	49	240
Reduction in indoor water use in existing residential units (MG)	39	98
Reduction in indoor water use in existing businesses (MG)	3	7
Reduction in indoor water use in new residential units (MG)	46	132
Reduction in water use at City buildings with rainwater catchment (MG)	0.0016	0.0047

MG = million gallons

GHG Method

The team estimated the total water use that occurs indoors in Laguna Beach and determined the amount that would be reduced based on assumed participation levels in appliance/fixture retrofit programs. The project team then used the water savings to determine the decrease in electricity use and direct wastewater process emissions associated with this effort and applied the appropriate electricity emissions coefficients to identify the GHG savings. For rainwater catchment, the project team estimated the square footage of City-owned building roofs and combined that with the average rainfall in the area to determine the amount of water that could be caught and therefore saved. They then used the water savings to determine the decrease in

electricity use and direct wastewater process emissions associated with this effort and applied the appropriate electricity emissions coefficients to identify the GHG savings.

Sources

California Department of Water Resources. 2023. *California Water Plan Update 2023.* https://water.ca.gov/Programs/California-Water-Plan/Update-2023.

National Centers for Environmental Information. (n.d.). *U.S. Climate Normals: 1991-2020.* National Oceanic and Atmospheric Administration. https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-annualseasonal&timeframe=30&station=USC0004464.

Strategy 16: Reduce GHG emissions associated with wastewater processing.

Assumptions

Assumption	2030	2045
Percentage of existing homes installing greywater systems	5%	20%

GHG Reductions

Emission	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	40	Less than 10	40	Less than 10

Activity Reductions

Factor	2030	2045
kWh	48,900	191,830

Performance Indicators

Indicator	2030	2045
Number of homes with laundry-to-lawn systems	246	1,037
Number of homes with other greywater systems	246	1,037

GHG Methods

Working on the assumption that approximately half of greywater systems are laundry-to-landscaping, and that the other half uses greywater from additional sources such as wash basins and showers, the project team identified the water savings resulting from greywater systems for an individual home or business. The project team then used the water savings to determine the decrease in electricity use for water/wastewater treatment and direct process emissions associated with this effort per building, and then applied the projections of greywater installations at existing Laguna Beach buildings as part of retrofit activities to identify the total water, electricity, and direct process emissions. The team applied the appropriate electricity emissions coefficients to identify the additional GHG savings.

Sources

American Water Works Association 1999. *Residential end uses of water.* https://www.awwa.org/Portals/0/AWWA/ETS/Resources/WaterConservationResidential_End_Uses_of_Water.pdf.

Strategy 17: Increase carbon sequestration on natural and urban lands.

Assumptions

Assumption	2030	2045
Percentage increase in urban tree canopy	5%	10%
Percentage of municipal roof area converted to green	5%	10%
Percentage increase in grassland (carbon sequestration landscape)	3%	7%

GHG Reductions

Emission	Without CCA		With CCA	
	2030	2045	2030	2045
Emissions reduction ($MTCO_2e$)	160	270	160	270

Activity Reductions

Activity	2030	2045
kWh	10	10

Performance Indicators

Indicator	2030	2045
Additional acres of tree canopy	29	57
Additional acres of open space/recreational/natural lands	5.2	5.6

GHG Method

The project team determined the existing acreage of open space and natural lands in Laguna Beach from the City of Laguna Beach General Plan. They then assumed a conversion of some developed land to natural lands, or "carbon sequestration landscapes," and calculated the carbon savings from an increase in trees and grasslands. The project team also estimated the sequestration potential of an increase in green roofs on City-owned buildings.

Sources

City of Laguna Beach. 2011. *City of Laguna Beach General Plan.* https://www.lagunabeachcity.net/home/showpublisheddocument/8146/638001338428230000.

Intergovernmental Panel on Climate Change. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories.* "Volume 1: General guidance and reporting."

https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/4_Volume4/V4_13_An1_Worksheets.pdf.

California Air Pollution Control Officers Association. 2021. *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*.

Climate Adaptation Strategies

Below are the remaining strategies included in the CAAP. These strategies focus on adapting to potential climate change-related hazards and therefore do not contribute quantifiable GHG emission reductions. They are not included in the calculations towards the GHG emission reduction targets.

- **Strategy 1:** Enhance community resilience to wildfire risks through proactive mitigation and community preparedness.
- **Strategy 2:** Increase resilience for residents and persons with disabilities.
- **Strategy 3:** Ensure a resilient and thriving artist community.
- **Strategy 4:** Increase resilience and adaptation for residents.
- **Strategy 5:** Ensure essential services can plan for and adapt to climate change.
- **Strategy 6:** Plan for the long-term resilience of open space recreation and developed areas.

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