2025 ENCINITAS CAP

CLIMATE ACTION PLAN 2025

CITY OF Encinitas

City of Encinitas

Climate Action Plan

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TERMS AND DEFINITIONS

Some of the terms introduced in the 2025 Climate Action Plan are defined below to provide additional clarification and context. Where terms are not specifically defined herein, Encinitas Municipal Code Chapter 30.04, Definitions, may be referenced.

Adaptative Pathways	Flexible strategies and actions designed to address uncertain future conditions, typically in the context of climate change, where responses can be adjusted as more information becomes available.
Anthropogenic	An environmental change that is caused or influenced by human activities, either directly or indirectly. In the context of climate planning, this refers to activities such as fossil fuel combustion, waste disposal, and land use change.
Atmospheric Gases	The components that make up Earth's atmosphere. The atmosphere is a mixture of different gases that surround our planet, protecting it and supporting life.
Baseline	A reference point, typically used to measure progress, that indicates the starting conditions or greenhouse gas emissions levels before implementing any action or intervention.
California Environmental Quality Act	(CEQA) A California law that requires state and local agencies to assess and disclose the environmental impacts of proposed projects or actions before they are approved or carried out.
Carbon Dioxide Equivalent	A unit of measurement used to compare the climate impact of different greenhouse gases by converting their emissions into an equivalent amount of carbon dioxide based on their respective global warming potential (GWP). This CAP measures greenhouse gas emissions in metric tons of carbon dioxide equivalent ($MTCO_2e$).
Carbon Footprint	The total amount of greenhouse gases emitted by an individual, organization, or product.
Carbon Sequestration	The process of capturing and storing carbon dioxide from the atmosphere, typically in vegetation, soils, or underground geological formations, to mitigate climate change.
Chlorofluorocarbons	Synthetic compounds that contain chlorine, fluorine, and carbon that act as a greenhouse gas and ozone-depleting substance. They were used in many products, including refrigerants, solvents, and aerosol sprays, but their use has largely been banned through the United Nation's 1987 Montreal Protocol.
Clean Air Act	A U.S. federal law that regulates air emissions from stationary and mobile sources, with the goal of ensuring air quality and protecting public health.
Climate Change	Long-term shifts in global or regional climate patterns, often associated with human activities that increase the concentration of greenhouse gases in the atmosphere.

Co-Benefits	The complementary, positive side effects that would result from implementation of policies and programs that reduce GHG emissions.
Decarbonization	The process of eliminating greenhouse gas emissions from human activity to combat climate change.
Deforestation	The intentional clearing of forests to make room for agriculture, logging, mining, and development. It can also occur naturally due to wildfires and other disasters.
Electricity	A form of energy resulting from the existence and movement of charged particles, such as electrons and protons. Electric energy is used in buildings and vehicles.
Emissions	The release of gases, including greenhouse gases and criteria pollutants, into the atmosphere from human activity.
Energy Code	Regulations or standards that dictate minimum energy performance requirements for buildings, equipment, and systems to promote energy conservation.
Energy Efficiency	The process of reducing the amount of energy required to power devices and equipment.
GHG Inventory	A comprehensive accounting of all greenhouse gas emissions produced by an entity, over a specified time period, to track and manage greenhouse gas emissions.
GHG Reduction Target	A specific goal or target for reducing greenhouse gas emissions by a certain date.
Global Warming Potential	A measure of how much heat a greenhouse gas traps in the atmosphere compared to carbon dioxide over a specific period.
Greenhouse Gas (GHG)	Gases that trap heat in the Earth's atmosphere and contribute to global warming. Greenhouse gases are both naturally occurring and generated by human activities.
Hydrofluorocarbons	Synthetic compounds that were developed to replace CFCs, acting as a potent, but short-lived greenhouse gas. They are used in many products, including refrigerants, solvents, and aerosol sprays.
Natural Gas	A fossil fuel made of a mixture of hydrocarbons, primarily methane. When combusted, natural gas is used as a form of energy used in residential, commercial, and industrial buildings.
Off-road Transportation	The use of air and water vessels, heavy-duty construction equipment (e.g., excavators, cranes, dozers), landscaping equipment, and other off-road equipment. A portion of these vessels and equipment use two-stroke and/or diesel engine design, which can generate a significantly more greenhouse gas and air pollutant emissions than 4-stroke engine design.
On-road Transportation	Travel associated with passenger cars; light-, medium-, and heavy-duty trucks; buses; motor homes; and motorcycles on roadways.

Perfluorocarbons	Synthetic, chemically inert compounds made of carbon and fluorine, that act as a greenhouse gas with exceptionally long atmospheric lifetimes. They are used in a variety of applications, including oxygen carriers, drug delivery, and molecular imaging.
Photovoltaic	The conversion of light into electricity using specific semiconducting materials. The application is commonly used to generate a renewable source of electricity through solar photovoltaic panels.
Projections	Estimates of future greenhouse gas emissions based on expected trends, and existing and proposed policies and/or regulations.
Resiliency	The ability of a system, community, or individual to adapt to and recover from climate change impacts and environmental challenges.
Sea-Level Rise	The increase in the average water level of the world's oceans, largely as a result of climate change.
Solid Waste	Any discarded material, such as trash or garbage, from homes, businesses, and other activities. Includes a mix of organic and inorganic materials.
Vehicle Miles Traveled	A calculation of the total distance traveled by vehicle trips within a certain period, often used to assess transportation-related emissions and congestion.
Vulnerability Assessment	An evaluation of a system, community, population, or region's susceptibility to harm from climate change based on their exposure to changes in the environment.
Wastewater	Water that has been used in homes, businesses, and industrial operations which now requires treatment prior to disposal. The treatment of domestic wastewater generates fugitive greenhouse gas emissions.
Water	A chemical compound essential for life. Used for drinking, cleaning, irrigation, and in industrial processes. The manual transport, treatment, and distribution of water requires the use of energy which can generate greenhouse gas emissions.
Zero Waste	A waste management philosophy that aims to eliminate waste by redesigning systems to prevent waste, reduce consumption, and maximize recycling and reuse.

ACRONYMS AND ABBREVIATIONS

ºC	degrees Celsius
ºF	degrees Fahrenheit
AB	Assembly Bill
AF	acre-feet
APG	California Adaptation Planning Guide
ATP	Active Transportation Plan
AR5	Fifth Assessment Report
BAU	business-as-usual
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
CALGreen	California Green Building Standards Code
CalOES	California Office of Emergency Services
CAP	Climate Action Plan
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	chlorofluorocarbons
CH_4	methane
CIP	Capital Improvement Program
City	City of Encinitas
CNRA	California Natural Resources Agency
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CoSMoS	Coastal Storm Modeling System
DOC	Department of Conservation
DOE	Department of Energy
DWR	Department of Water Resources
EO	Executive Order
EPA	U.S. Environmental Protection Agency

EPIC	Energy Policy Initiatives Center
EUSD	Encinitas Union School District
EV	Electric vehicle
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GPCD	gallons per capita per day
GWP	global warming potential
HEU	Housing Element Update
HFC	hydrofluorocarbon
ICA	Implementation Cost Analysis
ICLEI	Local Governments for Sustainability
IPCC	Intergovernmental Panel on Climate Change
kW	kilowatt
kWh	kilowatt hour
lbs.	pounds
LCI	Governor's Office of Land Use and Climate Innovation
LiDAR	Light Detection and Ranging
LED	light-emitting diode
MAP	Modal Alternatives Project
MHMP	Multi-Jurisdictional Hazard Mitigation Plan
MPOs	Metropolitan Planning Organizations
$MTCO_2e$	metric tons of carbon dioxide equivalent
MW	megawatt
N_2O	nitrous oxide
NCTD	North County Transit District
O_3	ozone
OMWD	Olivenhain Municipal Water District
OPR	Office of Planning and Research

PFC	perfluorocarbon
ppm	parts per million
PV	photovoltaic
RTP	Regional Transportation Plan
RPS	Renewables Portfolio Standards
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDCP	San Diego Community Power
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SDLC	School District Liaison Committee
SDWD	San Dieguito Water District
SDUHSD	San Dieguito Union High School District
TDM	transportation demand management
UHIE	Urban Heat Island Effect
USGS	U.S. Geological Surveys
UWI	urban-wildland interface
VHFHSZ	Very High Fire Hazard Severity Zones
VMT	vehicle miles traveled
ZEV	zero-emission vehicle

CITY OF Encinitas

Executive Summary

A Climate Action Plan (CAP) provides a comprehensive roadmap to address the challenges of climate change in the City of Encinitas (City). The CAP is an independent document, that works with the City's current adopted General Plan, Municipal Code, Specific Plans and Local Coastal Program (LCP) providing measures, strategies and actions to assess how the City will handle climate change. To combat the effects of climate change, the City will need to reduce greenhouse gas (GHG) emissions from activities within the City while supporting the community in adapting to and improving its resiliency to a changing climate over the long term. The City has taken a proactive approach to climate action, having developed its first CAP in 2011, the first comprehensive update in 2018, and an interim update in 2020. The 2025 CAP represents the next update in the City's climate planning efforts, that has been developed to account for new legislation, recent market and technology trends, CAP implementation successes, and ongoing assessment of local GHG emissions.

The scientific consensus is that human activity is the causal agent of global climate change and that significant reductions in human-caused GHG emissions are needed by the mid-21st century to prevent the most catastrophic effects of climate change (Intergovernmental Panel on Climate Change [IPCC]2023). To this end, the State of California has enacted a suite of legislation to commit to lowering GHG emissions. The first landmark legislation was in 2006, the California Global Warming Solutions Act (Assembly Bill [AB] 32), which established the State's first target to reduce GHG emissions. AB 32 established a goal of lowering statewide emissions to 1990 levels by 2020. The City developed its first CAP in 2011 to establish a strategy for reducing citywide emissions in line with this State target.

Since AB 32 became law, the State has continued to push forward with statewide GHG reduction targets, setting more ambitious and longer-term commitments. In 2016, Governor Brown signed Senate Bill (SB) 32 into law, which established a new mid-term GHG reduction target of 40 percent below 1990 levels by 2030. The most recent and significant statewide GHG reduction target was established by AB 1279, the California Climate Crisis Act, which codifies the State's long-term target of reaching net-zero emissions by 2045 through an 85 percent reduction in anthropogenic emissions below 1990 levels by 2045. These two more recent legislative targets are the benchmarks for the GHG reduction targets and strategies to reduce emissions in this 2025 CAP.

In addition to State legislative GHG reduction targets, local policy initiatives drive the City to create, update, and implement a CAP. The CAP has been regularly updated to align with the growth projections and policies of the City's General Plan. With the adoption of the 2019 Housing Element, the City committed to updating its CAP within 20 months to account for additional growth in population to support regional housing needs, which was accomplished with the 2020 interim CAP update. The 2025 CAP is a more comprehensive update to the CAP, but serves the same purpose of reducing the GHG emissions that would be generated by future growth in Encinitas to align with State legislative GHG reduction targets. The adaptation strategies of the 2025 CAP fulfill the goals of other General Plan elements, including the Safety Element and Resource Management Element by providing strategies to adapt to local climate hazards and protect coastal resources. Collectively, the 2025 CAP consolidates the approach the City will take to implement resilience and adaptation goals of the General Plan and mitigate GHG emissions generated from the buildout of the General Plan.

The key components of the City's climate action planning process are shown in Figure ES-1 and briefly summarized below:

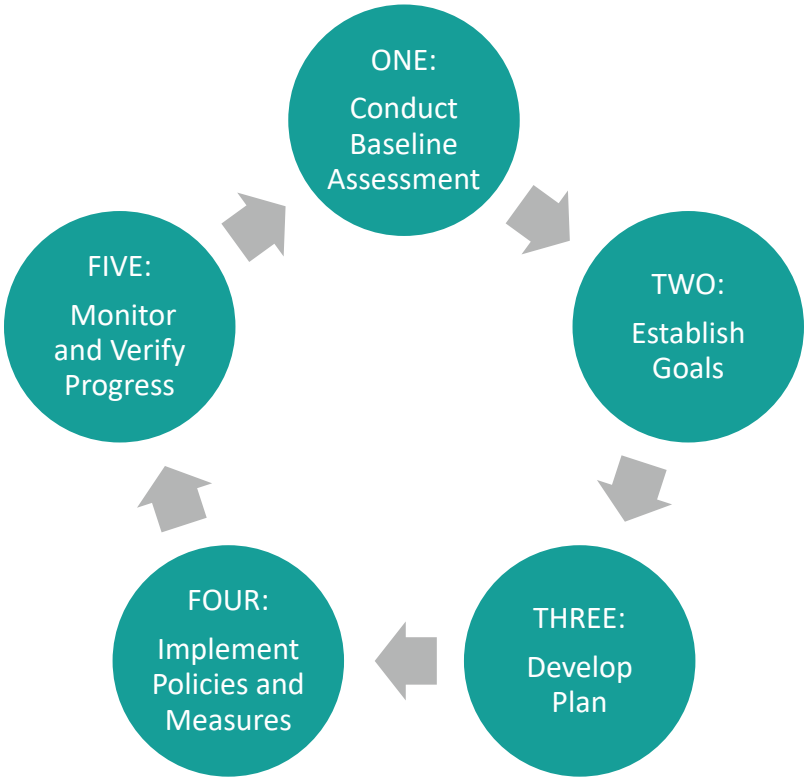


Figure ES-1: Climate Action Planning Milestones

1. Prepare a baseline GHG emissions inventory

The baseline year of 2016 was established for the 2025 CAP. Approximately 381,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) were emitted by citywide sources in in 2016. The largest source of emissions was the on-road transportation sector which accounted for 58 percent of the inventory; the electricity sector, the next largest, accounted for approximately 21 percent of the inventory. See Chapter 2 for more details.

GHG Emission Sectors in 2016 Baseline Inventory:

1. On-Road Transportation (58%)
2. Electricity (21%)
3. Natural Gas (15%)
4. Solid Waste (4%)
5. Water (1%)
6. Off-Road Transportation (1%)
7. Wastewater (1%)

Note: Values may not add to 100% due to rounding

2. Calculate GHG emissions projections and develop reduction targets

Future emissions were estimated based on business-as-usual (BAU) conditions. Without any actions taken by the City, GHG emissions are expected to increase by 2030 and 2045. The GHG emissions reduction targets for the 2025 CAP were established consistent with State guidance and legislative targets:

- Reduce emissions 40 percent below 2016 baseline levels by 2030, consistent with SB 32; and
- Reduce emissions 85 percent below 2016 baseline levels by 2045, consistent with AB 1279.

The 2025 CAP contains a total of 32 GHG reduction measures. The combination of all measures contributes towards achieving the 2030 and 2045 targets.

Legislative actions by federal or State agencies help to reduce emissions in the future but are not sufficient to achieve the 2030 and 2045 targets. Achieving the 2030 and 2045 targets will require local action to help close the gap between legislative-adjusted emissions projections and the emissions limits established by the 2025 CAP targets. See Chapter 2 for more details.

3. Identify local GHG emissions reduction strategies, goals, measures, actions, and supporting actions to help the City achieve the 2030 and 2045 targets.

GHG reduction strategies in the 2025 CAP are aligned with the GHG inventory sectors and include a total of 32 specific GHG reduction measures, as described in Chapter 3. The top three measures in the 2025 CAP that will achieve the highest local GHG emissions reductions include:

- CAP Measure BD-5: Decarbonize existing buildings. This measure is expected to reduce emissions by 7,001 and 28,004 $MTCO_2e$ by 2030 and 2045, respectively.
- CAP Measure ZW-1: Implement a Zero Waste Program. This measure is expected to reduce emissions by 10,357 and 12,694 $MTCO_2e$ by 2030 and 2045, respectively. and
- CAP Measure RE-1: Maintain membership in San Diego Community Power. This measure is expected to reduce emissions by 18,267 $MTCO_2e$ by 2030.

The top three GHG reduction measures will reduce City emissions by a total of 35,625 and 40,698 $MTCO_2e$ by 2030 and 2045, respectively.

Co-benefits are additional positive outcomes that are not the primary intent of GHG reduction measures and actions identified in this CAP.

Each measure will be realized through a set of implementation actions. These are programs, policies, or projects the City will implement that will have an direct effect on GHG emissions reductions. The 2025 CAP also includes a number of supporting measures that are intended to contribute towards the success of the GHG reduction strategies, but may not result in direct GHG emissions reductions. While the measures in the 2025 CAP are generally geared towards reducing GHG emissions, many will also result in health, environmental, and/or economic "co-benefits," in addition to climate adaptation co-benefits. Each CAP measure includes equity considerations, which are factors that should be considered to ensure CAP implementation benefits historically underserved populations.

4. Address climate change vulnerabilities with adaptation strategies that would improve community sustainability and resilience.

Specific adaptation strategies are included in Chapter 4 to address the impacts of climate change. Many of the strategies require the City and other partnering agencies to address climate-related risks as part of existing planning processes, as well as making adjustments in the way City services and infrastructure are maintained and operated. Community education and awareness are important components of the adaptation strategies.

The 2025 CAP integrates the climate adaptation work completed as part of the City's 2023 Safety Element update, including key components of the LCP and Resource Management Element of the General Plan. In accordance with State law, the Safety Element update included a risk assessment related to various natural hazards and potential disasters, including climate change. To address climate change in the Safety Element update, a Climate Vulnerability Assessment and Adaptation Framework was developed and adopted by the Encinitas City Council, in accordance with Senate Bill 379 and the Office of Land Use and Climate Innovation (LCI) General Plan Guidelines (City of Encinitas, 2024). Chapter 4 includes an overview of results of the Climate Vulnerability Assessment and integrates the strategies of the Adaptation Framework by reference.

The adaptation strategies of the 2023 Safety Element update and 2025 CAP utilize the most recent guidance from the State, the *California Adaptation Planning Guide* (APG). The APG, developed by California Office of Emergency Services (CalOES) and California Natural Resources Agency (CNRA), helps communities throughout California plan for and adapt to the impacts of climate change (California Adaptation Planning Guide 2020). In 2020, after the City's 2020 interim CAP Update was completed, the APG was updated from a 9-step process to a 4-step process. While the number of steps was reduced, the robust nature of the planning process remains intact for the 2025 CAP.

5. Develop implementation and monitoring mechanisms that will help the City ensure the goals and targets are achieved.

Implementation of the measures and actions in the 2025 CAP will require the City to develop and implement new ordinances, programs, and projects, or modify existing ones. This will require careful consideration of the operational and capital resources needed, as well as the timing and phasing of implementation. To this end, the City has completed an Implementation Cost Analysis that provides the public, decision makers, and those tasked with implementation a guide for the roles, timing, and economics of CAP implementation. Chapter 5 outlines these considerations.

Monitoring is an important aspect of the 2025 CAP to ensure that the City is on track to achieve the GHG reduction targets and desired outcomes for increasing resilience in the face of a changing climate. To this end, the City should review and update the GHG emissions inventory periodically, track the implementation status of each measure in the 2025 CAP annually, and conduct future CAP updates periodically.

Local action on climate change cannot be addressed insularly by one agency or community but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. On a communitywide level, individuals and businesses can play an important role in combating climate change. By changing habits to consume less energy, producing less waste through recycling, organics processing, and conserving water, and driving less by choosing to carpool, take transit, or walk and bike more frequently, individuals and businesses can work towards reducing their carbon footprint. The combination of these small efforts can lead to better outcomes for the environment and the City.

CHAPTER 1

Introduction

1.1. Climate Action Plan Overview

Climate Action Plans (CAPs) serve as comprehensive roadmaps that outline the specific activities that a community and municipality will take to reduce greenhouse gas (GHG) emissions and the potential impacts of climate change within the borders of a jurisdiction. In developing a CAP, jurisdictions evaluate the volume of GHGs emitted during a baseline year and determine the amount of emissions that need to be reduced to achieve statewide GHG reduction targets (discussed in further detail in Section 1.3, "Regulatory Framework"). The City of Encinitas (the City) utilizes the CAP to mitigate existing and future GHG emissions from growth induced by the City's General Plan, while also implementing General Plan goals focused on improved resilience to climate change impacts. As such, the CAP must be regularly updated to reflect the most recent statewide GHG reduction targets, local growth projections, and General Plan policies.

2011 CAP

In 2011, the City adopted its first Climate Action Plan (2011 CAP) to provide guidance to the City to achieve statewide reduction targets and to respond and adapt to the impacts of climate change. The development of the 2011 CAP was driven by a partnership between the City, members of the San Diego Regional Climate Collaborative (formerly San Diego Regional Climate Protection Initiative), other local governments in the County of San Diego, and Local Governments for Sustainability (ICLEI) to discuss how the region was going to monitor and address global climate change. This partnership facilitated the City's first GHG inventory for the year 2005, which served as the 2011 CAP's baseline year. The 2005 baseline totaled 548,993 metric tons of carbon dioxide equivalent ($MTCO_2e$) emissions per year, or 8.78 $MTCO_2e$ per year per capita. Under a business-as-usual (BAU) scenario, which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions to reduce GHG emissions, the 2011 CAP projected that the City's GHG emissions in 2020 would be 646,947 $MTCO_2e$ per year or 9.5 $MTCO_2e$ per year per capita. To achieve consistency with federal and State GHG reduction goals, the CAP specified that the City would reduce emissions 12 percent below 2005 levels by 2020, equivalent to reducing emissions by 164,159 $MTCO_2e$ in 2020.

2018 CAP

In 2018, the City adopted an updated Climate Action Plan (2018 CAP) as a required mitigation measure of the City's 5th Cycle Housing Element Update (HEU) Environmental Assessment. The 2018 CAP committed to an update within 20 months of the effective date of the HEU to reflect the impact of anticipated housing units on GHG emissions, in accordance with mitigation measure GHG-2 in the HEU Environmental Assessment, completed pursuant to California Government Code § 65759. The 2018 CAP built upon the goals of the 2011 CAP and provided a more recent GHG inventory for the year 2012. The 2012 inventory demonstrated that activities within the City emitted approximately 459,000 $MTCO_2e$. Consistent with recommendations from the Assembly Bill (AB) 32 2008 Scoping Plan, the 2018 CAP established GHG emissions reduction target of 13 percent below 2012 levels by 2020 and a 41 percent below by 2030, in line with then current statewide targets. As calculated in the 2018 CAP, this equated to reducing emissions by 53,232 $MTCO_2e$ by 2020 and 197,724 $MTCO_2e$ by 2030. The City has successfully implemented many measures of the 2018 CAP, and a preliminary 2020 GHG inventory shows that the 2020 GHG emissions reduction target is likely to have been met.[1]

[1] See the City's 2023 Climate Action Plan Annual Report for more information on meeting GHG reduction targets and the successes of the 2018 CAP at: https://www.encinitasca.gov/home/showpublisheddocument/10928/638636526178270000

2020 Interim CAP Update

The City completed a 5th Cycle update to its HEU in March 2019. The 2020 interim update of the CAP, adopted by City Council on November 18, 2020, incorporated the HEU residential units into the business-as-usual projections and legislatively adjusted projections and presented associated updates and revisions to the CAP measures. Updates to the emissions reduction measures were needed for various reasons including:

- Edits to ensure measures can have cost-effective implementation,
- Identification of improved or more effective measures,
- Calculation of GHG emissions avoided due to availability of new methods and data sources,
- Modified calculations to account for new federal or State regulations.

2025 CAP

The current update to the City's Climate Action Plan, the 2025 CAP, serves as a comprehensive CAP update based on the City's 5-year update cycle. The 2025 CAP includes a re-evaluation and re-alignment of the City's emissions reduction targets with current State guidance, including AB 1279. This legislation codifies the State's carbon neutrality target into State law, along with a goal of reducing GHG emissions by 85% below 1990 levels by 2045.

The 2025 CAP includes an updated baseline GHG emissions inventory for the year 2016, and updated GHG emissions projections. The updated GHG emissions projections consider the most recent City growth projections, and the influence of State legislation and regulations adopted since the 2020 Interim CAP Update. The 2025 CAP GHG reduction measures are organized into strategies, goals, measures, and actions based on the sectors evaluated in the 2016 inventory (i.e., on-road transportation, electricity, natural gas, solid waste, water, off-road transportation, and wastewater). Specific primary implementation actions and their supporting actions are outlined in Chapter 3 along with their associated reduction potential. The 2025 CAP also includes an updated analysis of future climate change vulnerabilities and identifies strategies to build adaptive capacity as a City, presented in Chapter 4.

The 2025 CAP represents the City's commitment to addressing climate change, and evaluating a pathway for achieving long-term decarbonization. Chapter 2 includes details on the City's baseline emissions inventory and projections and establishes reduction targets for 2030 and 2045. Chapters 3, 4, and 5 of the 2025 CAP include strategies, specific primary implementation actions and supporting actions, and implementation and monitoring mechanisms to reduce GHG emissions and plan for climate change impacts. A more detailed comparison of the 2020 and 2025 CAPs is provided in Appendix A.

1.2. Introduction to Climate Change Science

The greenhouse effect results from the concentration of atmospheric gases referred to as GHGs, which insulate the Earth and help regulate its temperature. The most prevalent GHGs in our atmosphere include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), chlorofluorocarbons (CFCs), and hydrofluorocarbons (HFCs). These gases serve as global insulators, reflecting Earth's visible light and infrared radiation to keep temperatures on Earth stable. Without the greenhouse effect, Earth would not be able to support life as we know it.

Over the past two decades, human activities (e.g., the burning of fossil fuels for transportation and energy, increasing rates of deforestation and development) have contributed to elevated concentrations of GHGs in the atmosphere. Human-caused (i.e., anthropogenic) emissions of GHGs have resulted in above-normal ambient concentrations of GHGs, intensifying the greenhouse effect, and leading to a trend of abnormal warming of the Earth's climate known as *global climate change*. There is a strong scientific consensus that there is substantial evidence to indicate that most of the changes in the Earth's climate during the last 50 years are a result of anthropogenic GHG emissions (Intergovernmental Panel on Climate Change [IPCC] 2014: 3, 5). Global climate change, in turn, is the driver behind changes in precipitation patterns, rising temperatures, shrinking polar ice caps, sea-level rise, and other impacts to biological resources and humans. Chapter 2 of the 2025 CAP summarizes the City's GHG emissions and local contribution to global climate change.

Climate change is a global problem and can lead to significant fluctuations in regional climates. While there is consensus that global climate change is occurring and that it is exacerbated by human activity, there is less certainty as to the timing, severity, and potential consequences of climate change phenomena, particularly at the local level. Chapter 5 of the 2025 CAP discusses the predicted climate change effects in the City and recommends strategies to adapt to climate change.

1.3. Regulatory Framework

In response to the threat of global climate change, the State and City have already taken several steps to both reduce GHG emissions and adapt to climate change. These efforts, and the legislative background summarized in the following sections, provide important policy drivers and context for the 2025 CAP.

1.3.1. California

In 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S3-05, which directed California to reduce GHG emissions to 1990 levels by 2020 and to 80 percent below 1990 levels by 2050. A year later, in 2006, the Global Warming Solutions Act, Assembly Bill (AB) 32, was passed, establishing regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions. AB 32 put a cap on GHG emissions, setting a target of reducing GHG emissions to 1990 levels by 2020. As part of its implementation of AB 32, the California Air Resources Board (CARB) was tasked with developing a Scoping Plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions, which was to be updated at least once every five years. The first Scoping Plan was approved in 2008, demonstrating a pathway towards meeting AB 32 statewide GHG emissions targets.

As directed by SB 32 and AB 1279, the State aims to reduce annual GHG emissions to:

- 40 percent below 1990 levels by 2030; and
- 85 percent below 1990 levels by 2045, with net-zero emissions achieved through carbon dioxide removal.

On April 20, 2015, Governor Edmund G. Brown Jr. signed EO B-30-15, establishing a new GHG emissions reduction target of 40 percent below 1990 levels by 2030. This target aligns with the 27-nation European Union which adopted the same target in October 2014. EO B-30-15 also directed CARB to update the Scoping Plan to reflect the path to achieving the 2030 target. In September 2016, Governor Brown signed SB 32, which codified into statute the mid-term 2030 target established by EO B-30-15. The 2030 GHG emissions reduction target places California on a trajectory to meet the goal of reducing statewide emissions to 80 percent below 1990 levels by 2050. On January 20, 2017, CARB released the *2017 Climate Change Scoping Plan Update*, which laid out the framework for achieving the 2030 reductions as established in EO B-30-15 and SB 32. The most recent and significant statewide GHG reduction target was established by AB 1279 of 2022, the California Climate Crisis Act, which codifies the State's long-term target of reaching net-zero emissions by 2045 through an 85% reduction in anthropogenic emissions below 1990 levels by 2045. A statewide carbon neutrality goal by 2045 was initially introduced through Executive Order B-55-18. The signing of AB 1279 into law now establishes the requirement of meeting this target for the State, and supersedes the long-term target established by EO S-3-05. CARB released a subsequent Scoping Plan update in 2022, the *2022 Scoping Plan for Achieving Carbon Neutrality*. This most recent Scoping Plan establishes the State's strategy for the deep decarbonization needed to meet net-zero emissions.

In addition to legislation setting statewide GHG reduction targets, SB 375, signed by Governor Schwarzenegger in 2008, better aligned regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocations in each MPO's Regional Transportation Plan (RTP). CARB, in consultation with the MPOs, provided each affected region with GHG reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035. SANDAG adopted *San Diego Forward: The Regional Plan* that integrated the RTP and SCS in October 2015. SANDAG adopted a subsequent update to the plan in December 2021 which maintained the SCS and GHG reduction targets for 2035.

To effectively address the challenges that a changing climate will bring, the State also prepared the 2009 California Climate Adaptation Strategy, which highlights climate risks and outlines possible solutions that can be implemented throughout the state. This strategy has since been updated in 2014 and 2021. The 2021 Strategy integrates key elements of the latest sector-specific plans, such as the *Natural and Working Lands Climate Smart Strategy*, *Wildfire and Forest Resilience Action Plan*, *Climate Action Plan for Transportation Infrastructure,* and *Water Resilience Portfolio*. It is organized around six outcome-based priorities and integrates key elements from numerous State plans and strategies, including statewide climate action plans, sector-based strategies, regionally focused strategies, and State stewardship plans.

Other federal and State regulations relevant to the 2025 CAP are identified in Table 1-1, below.

Table 1-1 Relevant Federal and State Regulations

Level	Regulation	Summary
Federal	Federal Clean Air Act (CAA)	In 2007, the U.S. Supreme Court ruled that CO_2 is an air pollutant as defined under the CAA, and the U.S. Environmental Protection Agency has the authority to regulate emissions of GHG.
Federal	Corporate Average Fuel Economy (CAFE) Standards	The federal CAFE Standards determine the fuel efficiency of certain vehicle classes in the U.S.
State	SB 97 (2007)	SB 97 required the State Office of Planning and Research to prepare, and the Natural Resources Agency to adopt, amendments to the State California Environmental Quality Act (CEQA) Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. Effective as of March 2010, the revisions to the CEQA Environmental Checklist Form (CEQA Guidelines, Appendix G) and the Energy Conservation Appendix (CEQA Guidelines, Appendix F) provide a framework to address global climate change impacts in the CEQA process. State CEQA Guidelines Section 15064.4 was also added to provide an approach to assessing impacts from GHGs.
State	Low Carbon Fuel Standards Program	The Low Carbon Fuel Standards Program was created by CARB as an outcome of AB 32, which establishes a credit trading program to reduce the life cycle carbon intensity of the statewide fuel supply. The program established a carbon intensity benchmark that reduces the carbon intensity of transportation fuels used in the state to 20 percent below 2010 levels by 2030. In November 2024, CARB approved updates to the carbon intensity benchmark, setting targets of 30 percent below 2010 levels by 2030 and 90percent below 2010 levels by 2045.
State	California Building Efficiency Standards Title 24 Part 6	The California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods.
State	California Green Building Standards Title 24, Part 11 (CALGreen)	The California Code of Regulations Title 24 Part 11: California's Green Building Standards Code (CALGreen) establishes mandatory measures and voluntary tiers for residential and nonresidential buildings, addressing energy efficiency, water conservation, indoor air quality, and material resource conservation to promote sustainable building practices and environmental stewardship.
State	AB 1493 (2002)	AB 1493 required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks.
State	AB 197 (2016)	AB 197 created a legislative committee to oversee CARB and requires CARB to take specific actions when adopting plans and regulations pursuant to SB 32 related to disadvantaged communities, identification of specific information regarding reduction measures, and information regarding existing GHGs at the local level.
State	SB 350 (2015), SB 100 (2018) and SB 1020 (2022)	SB 350 required the State to set GHG emissions reduction targets for the load serving entities through Integrated Resource Planning. SB 350 required an increase in the Renewable Portfolio Standard (RPS) such that 50 percent of retail electricity sales statewide are GHG-free by 2030 and doubling energy savings in electricity and natural gas end uses. The RPS target of SB 350 was expanded upon with SB 100, which established a 100 percent RPS target by 2045. SB 1020 accelerated the pace of reaching the target set by SB 100, establishing interim RPS targets of 90 percent by 2035 and 95 percent by 2040.

Table 1-1 Relevant Federal and State Regulations		
Level	**Regulation**	**Summary**
State	Advanced Clean Cars I and Advanced Clean Cars II	In January 2012, CARB approved the Advanced Clean Cars I regulation, which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. In 2022, the Advanced Clean Cars II regulation was adopted, which requires that all new passenger cars, trucks and SUVs sold in California be zero emission by 2035.
State	SB 379 (2015)	Beginning January 1, 2017, SB 379 required California cities and counties, upon the next revision of their local hazard mitigation plan, to include climate adaptation and resiliency strategies in the safety elements of their general plans. The bill requires the safety element update to include a set of goals, policies, and objectives for their communities based on a vulnerability assessment, as well as implementation measures to increase community resilience to climate change. The safety element update can incorporate these components by reference from an adopted local hazard mitigation plan and/or climate adaptation plan.
State	SB 1383 (2016)	SB 1383 established statewide waste reduction targets to achieve a 50 percent reduction in the disposal of organic waste from 2014 levels by 2020 and a 75 percent reduction by 2025. The law also requires 20 percent of edible food waste to be recovered for human consumption by 2025. CalRecycle was given regulatory authority of SB 1383 and established regulations in 2016 by which local municipalities must comply.
State	AB 341 (2011)	AB 341 sets forth the requirements of the statewide mandatory commercial recycling program. Municipal jurisdictions must implement a commercial solid waste recycling program that consists of education, outreach and monitoring of businesses, and report the progress achieved.

1.3.2. City of Encinitas

The City's General Plan drives the need to create, update, and implement a CAP. As discussed in Section 1.1, the CAP has been regularly updated to align with the growth projections and policies of the City's General Plan. Without action, buildout of the General Plan land uses will contribute additional GHG generating activities, including energy use, vehicle travel, and waste generation. The CAP is aligned with the land use and growth projections of the General Plan such that the City can mitigate local GHG emissions associated with General Plan buildout to below levels consistent with statewide GHG reduction targets. The most recent updates to the General Plan include the 5th and 6th cycle HEUs, adopted in 2019 and 2021, respectively. The 2025 CAP incorporates these land use and growth projections, such that the 2025 CAP can serve to mitigate GHG emissions associated with the buildout of the General Plan.

The 2025 CAP integrates the climate adaptation work completed as part of the City's 2023 Safety Element update, including key components of the Local Coastal Plan (LCP) and Resource Management Element of the General Plan. In accordance with State law, the Safety Element update included a risk assessment related to various natural hazards and potential disasters, including climate change related hazards. To address climate change in the Safety Element update, a Climate Vulnerability Assessment and Adaptation Framework was developed and adopted by the Encinitas City Council, in accordance with Senate Bill 379 and the Office of Land Use and Climate Innovation (LCI) General Plan Guidelines (See Appendix B). The 2025 CAP incorporates the strategies of the Adaptation Framework by reference, and serves to consolidate the City's climate-related policies.

1.3.3. Relationship to CEQA

The California Environmental Quality Act (CEQA) is a statute that requires local agencies to identify significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. In 2007, California's lawmakers enacted SB 97, which expressly recognizes the need to analyze GHG emissions as part of the CEQA process. SB 97 required the Governor's Office of Land Use and Climate Innovation (formerly Office of Planning and Research) to develop recommended amendments to address GHG emissions as an environmental effect.

CAPs are considered a "project" subject to compliance with CEQA because they are activities undertaken by a public agency that are subject to discretionary approval and may cause direct or indirect effects on the environment. The City performed review under CEQA of the 2018 CAP, in the form of the 2017 Initial Study/Negative Declaration (2017 ND), which determined that implementation of the 2018 CAP would not have a significant impact on the environment. An addendum to the 2017 ND was prepared alongside the 2020 interim CAP Update, which determined that there were no substantial changes to the 2018 CAP that would require revisions to the 2017 ND. The 2025 CAP includes assessment of long-term GHG reduction targets, additional and modified CAP measures, and an updated adaptation strategy. These changes have been analyzed based on the same CEQA thresholds as the 2017 ND in an additional addendum to the 2017 ND.

The CEQA Guidelines (specifically Section 15183.5) establish standards for the contents and approval process of plans to reduce GHGs. With associated CEQA coverage, the 2025 CAP has been prepared consistent with those standards. As a CEQA Section 15183.5-qualified plan, the 2025 CAP affords development applicants the opportunity to use CEQA streamlining tools for the analysis of GHG emissions and related impacts for projects that are consistent with the 2025 CAP.

1.4. Climate Action Plan Implementation Successes

The City is actively engaged in addressing climate change, sustainability, and reductions in GHG emissions. From the City's first CAP in 2011 to the current, substantial progress has been made on implementation of projects, programs and policies to reduce GHG emissions and increase community resilience. Since the adoption of the 2018 CAP, the City has published annual reports on CAP implementation status and accomplishments each year.[2]

One of the most impactful and influential actions the City has taken was leading the establishment of the San Diego Community Power (SDCP) Joint Powers Authority in 2018, in coordination with the cities of La Mesa, Imperial Beach, Chula Vista, and San Diego. The formation of SDCP enabled Encinitas to establish Power100, SDCP's 100 percent renewable option, as the default power offering for all Encinitas customers. All customers have the option to opt down to the PowerOn, 50 percent renewable, rate, or opt out and have their electricity purchased by SDG&E. In 2023, the City had 26,248 SDCP customers with a community wide participation rate of 91.8 percent with 98.2 percent

[2] Climate Action Plan Annual Reports can be found on the City's Climate Action webpage at: https://www.encinitasca.gov/climateaction.

of customers in the City subscribed to the Power100 rate option. This action has resulted in the avoidance of substantial amounts of GHG emissions each year.

The City has also significantly reduced GHG emissions from new and existing development through adoption of local building codes that exceed the State minimum code, also known as “reach codes.” These reach codes ensure that all new buildings and substantial additions and alterations are energy efficient and incorporate electric vehicle charging infrastructure. The City’s reach codes adopted to date include the following:

- Ordinance No. 2022-13 requires residential remodels to install energy efficiency upgrades based on the building’s age.
- Ordinance No. 2022-14 requires higher energy efficiency standards for commercial buildings.
- Ordinance No. 2024-04 requires additional electric vehicle charging stations for new and existing development, and sets energy efficiency standards that promote, but don’t require, the construction of all-electric buildings.

The ability for residents and visitors of Encinitas to utilize active transportation modes has substantially improved, reducing vehicle travel in the City. Since 2012, The City has installed a total of 19.1 miles of bike lanes and 20.5 miles of pedestrian facilities. Many of the installations were protected bike and separated bike and walking lanes along Coast Highway and major east/west thoroughfares. The City intends to continue the planning and construction of active transportation facilities as it implements the 2023 Modal Alternatives Plan, which prioritizes mobility projects that provide maximum multimodal benefits.

1.5. Community Action and Co-Benefits

While global change is happening worldwide, local efforts to reduce human-induced GHG emissions and build resilience in the face of adverse climate change effects can make a difference. Local action on climate change cannot be addressed insularly by one agency or community, but requires active and ongoing partnerships between residents, businesses, the City, and other agencies and organizations in the region. By engaging in more sustainable practices, communities will be better suited to adapt to climate change and be more resilient in the future.

At the regional and local scale, individuals and businesses can play an important role in mitigating climate change. Individuals and businesses can work towards reducing their carbon footprint by changing habits to consume less energy, generate less waste through recycling and composting, conserve water, and drive less by choosing to carpool, take transit, or walk and bike more frequently. The combination of these small efforts can lead to better outcomes for the environment and the City.

Effective and long-term climate action and resiliency in the City can only be achieved through efforts that continue to change the way individuals interact with the environment. The 2025 CAP serves as a resource and starting point to support long-term community sustainability efforts. The City is committed to implementing climate action in an equitable manner. For instance, incentive programs to implement CAP Measures will be available to all City residents. In addition, the City will promote existing State and local incentive programs specifically targeted towards low-income communities. Impacts of climate change can disproportionately affect disadvantaged communities and the City will work to proactively identify them and implement strategies to reduce impacts. Additional details are provided in Chapter 3 as equity considerations for the 2025 CAP’s GHG emissions reduction measures.

While the CAP Measures included in the 2025 CAP are generally geared towards reducing GHG emissions, many will also result in environmental or economic "co-benefits." Co-benefits to the CAP Measures are categorized in four distinct areas: air quality, public health and safety, jobs and economy, and climate resilience. For example, a significant co-benefit of implementing 2025 CAP strategies related to reductions in motor vehicle use and associated fuel combustion will result in fewer toxic air contaminants, resulting in improved air quality and enhanced public health and safety as co-benefits. Other strategies focus on improving energy and water-use efficiency in new and existing buildings, which can also lower overall housing and building operation costs.

Co-benefits are the complementary, positive side effects that would result from strategies, actions, and measures identified in the CAP.

1.6. Social Equity

In the context of climate action and adaptation planning, social equity refers to ensuring that all communities, particularly the most vulnerable and historically marginalized populations, have equal access to the benefits of climate initiatives and are not disproportionately burdened by the impacts of climate change or the policies implemented to address it. By addressing systemic inequities, climate action can create a more just and resilient society where all populations can thrive in the face of climate change.

The City conducted outreach to various community groups during the CAP Update process to better understand equity concerns felt by residents and businesses. Through these outreach activities, the City aimed to understand racial and ethnic barriers in housing and bring underrepresented community organizations into the planning process of the 2025 CAP. The City also carried out research to further understand the community's socioeconomic characteristics using CalEnviroScreen 4.0, a tool developed by the Office of Environmental Health Hazard Assessment (OEHHA), an office within the California Environmental Protection Agency.

Through the outreach activities and research conducted, the City is aware that there are gaps in equity planning that can be addressed during the implementation of the 2025 CAP. As part of the 2025 CAP development, the City conducted an Equity Gap Analysis to understand areas where equity can be further addressed in the City's planning processes. To bridge the gaps, the City will encourage and facilitate continuous community involvement from underrepresented groups, bridging language barriers, working to alleviate issues experienced by cost and transportation-burdened households, creating local green jobs and workforce training, and focusing on climate adaptation efforts that prioritize the most vulnerable communities. Equity considerations for the 2025 CAP are discussed in more detail in Chapter 3 and 5, with the Equity Gap Analysis available as Appendix C.

1.7. Climate Action Plan Update

As part of the City's five-year update cycle established by the 2018 CAP, the City initiated preparation of the 2025 CAP in 2023. A primary driver for this comprehensive update is AB 1279, which was signed into law on September 16, 2022, to update the State's long-term GHG reduction targets. While the City has successfully implemented many of the GHG emissions reduction measures included in the current CAP, AB 1279 necessitates the need for the City to set and develop a strategy for meeting a long-term GHG reduction target for the year 2045 in alignment with the State. The 2025 CAP evaluates how the City will achieve substantial decarbonization by 2045 and build resilience to the physical impacts of climate change, while recognizing the need for equitable policy implementation.

1.7.1. Climate Action Plan Update Elements

The 2025 CAP outlines a course of action for the City to reduce community-wide GHG emissions, as well as prepare for and adapt to climate change.

The overarching goals of the 2025 CAP are to:

- Reduce GHG emissions from all emissions sectors identified in the City's GHG emissions inventory while enhancing carbon sequestration opportunities, and
- Identify adaptation actions for enhancing citywide resilience to the effects of climate change.

The 2025 CAP GHG reduction targets for the City were developed based on statewide targets established under SB 32 and AB 1279. The 2025 CAP aims to achieve the following local community-wide GHG reduction targets:

- 40 percent below 2016 levels by 2030, consistent with SB 32; and
- 85 percent below 2016 levels by 2045, consistent with AB 1279.

To achieve these objectives, the 2025 CAP identifies the following:

- A baseline level of GHG emissions and the potential growth of these emissions over time,
- The climate change effects expected to be experienced in the City,
- GHG emissions reduction targets to reduce the community's contribution to global warming; and
- Identification of strategies, measures, primary implementation actions, and supporting actions to comply with statewide GHG reduction targets, along with actions to help the community adapt to climate change impacts.

As part of 2025 CAP implementation, each strategy, measure, primary implementation action, and supporting action will be regularly assessed and monitored. Reporting on the implementation progress, periodic updates to the GHG emissions inventory, and other monitoring activities will help to ensure that the 2025 CAP is achieving GHG emissions reductions. See Chapter 5 for more information on administering, implementing, and monitoring the 2025 CAP.

1.7.2. Climate Action Plan Update Process

As part of the 2025 CAP update process, the City developed and implemented an Outreach and Engagement Plan (included as Appendix D) providing local residents, stakeholders, interested parties, and other agencies and individuals with the opportunity to participate in the climate action planning process.

The goals of outreach and engagement were to: (1) involve interested and affected parties in identifying needs, priorities, and values related to the 2025 CAP; (2) create an effective and meaningful outreach process where all members of the community, including those that are often underrepresented in traditional public engagement processes, can participate; (3) build a shared commitment and buy-in across decision makers, the public and stakeholders, and internal City departments; (4) share the purpose, need, and benefits of updating the CAP; (5) promote a broad understanding of the components of the 2025 CAP and expand the public's awareness of GHG reduction strategies, policies, and best practices; (6) highlight the importance of complying with relevant laws and regulations and their role in shaping the 2025 CAP; and (7) provide transparency in the methodologies and approaches for technical analyses that support the 2025 CAP. The rationale for each of these goals includes the following guiding principles, which were developed to further articulate the purpose of the Outreach and Engagement Plan:

- **Awareness** – The public and stakeholders must be aware of the planning process before they are able to participate.
- **Education** – Informing the public and stakeholders about the 2025 CAP, relevant laws and regulations, and the planning process is important for effective participation.
- **Input** – Individual knowledge and collective perspectives from the public and stakeholders can help the City better understand issues and challenges the community faces.
- **Equity** – Building capacity and empowering the public and stakeholders to be engaged in the process allows for more equitable outcomes and effective implementation.
- **Open and public process** – Having a clear process by which the public and stakeholders can participate, review, and provide feedback during the planning process will result in a CAP that better reflects community priorities. Additionally, as a plan intended to be used for streamlining the analysis of GHG emissions for individual projects under CEQA, the 2025 CAP must be adopted in a public process.

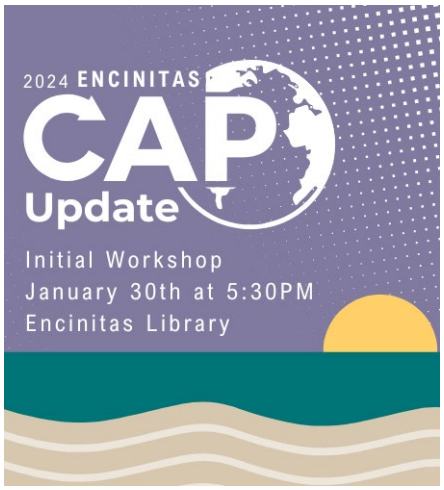
2025 CAP Workgroup Meetings

Internal feedback and review were facilitated through the CAP Workgroup. The CAP Workgroup is composed of staff members of all City departments including the City Manager's Office, Development Services, Public Works, Human Resources, Information Technology, Finance, San Dieguito Water District, Parks, Recreation and Cultural Arts, and Fire and Marine Safety. The CAP Workgroup's responsibilities include reviewing and providing comments and recommendations for key work products; providing recommendations for the feasibility of 2025 CAP measures; and using local expertise to offer recommendations of new and revised 2025 CAP measures and goals. The CAP Workgroup met periodically through the CAP update process to serve these functions.

Environmental Commission and City Council Meetings

The City's leadership and decision makers, including the City's Environmental Commission and City Council, were involved throughout the CAP development process. At the Environmental Commission's regular monthly meetings, the commission was briefed on the status and progress of the 2025 CAP update process as part of the Environmental Commission's work plan review. During the August 8, 2024 meeting, the Environmental Commission reviewed the proposed GHG emissions reduction measures for the 2025 CAP in detail and provided recommendations for the updated measures. Additionally, City staff provided an overview of the update process for the 2025 CAP at the January 17, 2024 City Council meeting.

Public Workshops



The City hosted three public workshops to share information with the community on the 2025 CAP and to receive public input on specific measures and actions that the City could implement to reduce GHG emissions. The first workshop on January 30, 2024 was intended to provide an overview of the process for updating the CAP and work completed to date, including the 2016 GHG inventory, GHG emissions projections, 2030 and 2045 GHG emissions reduction targets; as well as to receive recommendations from community members on what they would like to see the 2025 CAP accomplish. The purpose of the second workshop on July 16, 2024 was to solicit community feedback on the potential measures and actions to be included in the 2025 CAP. In advance of the third workshop on [future date to be identified], a complete draft of the updated CAP was made public for review and comment. The third public workshop was held on [future date to be identified] and provided an opportunity for the public to provide input on the complete draft of the CAP as well as the addendum to the CEQA Negative Declaration. See Appendix E for a summary of public input received.

Stakeholder Interviews

The City reached out to 24 different stakeholders and held interviews with 8 of them regarding the 2025 CAP. Various questions were discussed during the interviews, including but not limited to, what climate change impacts they are most concerned about, their feedback on the GHG emissions reduction targets being considered for the 2025 CAP, key areas that they believe the City should focus on to reduce GHG emissions, and input on climate equity considerations. The 8 stakeholders interviewed included:

- Building Industry Association,
- Community Resource Center,
- Cottonwood Creek Conservancy,
- Encinitas Bike Walk,
- San Diego Bike Coalition,
- San Luis Rey Band of Mission Indians,
- SanDiego350, and
- Sierra Club.

Notes from the stakeholder interviews listed above are available in Appendix E.

Online Survey

From August to November 2024, an online survey was posted on the City's website to gather information and feedback from the public on the candidate GHG emissions reduction measures. The survey received 18 responses. The survey results complemented feedback received at public workshops and were used to inform the development of the final list of GHG emissions reduction measures included in the Draft CAP.

Community Events

City staff sought out and attended a variety of community events as an opportunity to engage the public on the CAP update including EcoFest, Arbor Day, multiple farmer's market days, Encinitas Spring Street Fair, Cyclovia, and Encinitas Oktoberfest.

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CHAPTER 2

Greenhouse Gas Emission Inventory, Projections, and Targets

This chapter summarizes the community's contribution to global climate change by offering a detailed accounting of greenhouse gas (GHG) emissions within the City of Encinitas (City). It includes a discussion of the primary sources of GHG emissions from 2016 (i.e., baseline inventory); describes likely trends through 2045 if emissions are not reduced through federal, State or City efforts (i.e., projections); and sets benchmarks for reducing emissions by 2030 and 2045 (i.e., targets). GHG emissions from community activities are discussed in Sections 2.2 through 2.4.

2.1. Why Prepare a Greenhouse Gas Emissions Inventory?

Recent increases in global temperatures are highly correlated with elevated GHG emissions resulting from human activities. According to global climate science experts, to avoid "dangerous climate change" in the Earth's climate system, GHG emissions will need to be stabilized so that global temperatures do not increase more than 3.6 degrees Fahrenheit (°F) (2 degrees Celsius [°C]) above pre-industrial levels. To achieve this outcome, global carbon dioxide (CO_2) concentrations must be stabilized at 450 parts per million (ppm) (Intergovernmental Panel on Climate Change [IPCC] 2023).

One of the main objectives of the 2025 Climate Action Plan (2025 CAP) is to identify and reduce local contributions to global GHG emissions. This chapter is intended to serve as a foundation for establishing the GHG reduction measures and actions the City will implement to support global emissions reductions. Measuring GHG emissions is a critical first step in developing the 2025 CAP for several reasons. First, the GHG inventory identifies major sources and quantification of GHG emissions associated with activities and choices made by residents, businesses, and municipal operations. Second, the inventory provides the baseline that is used to project emissions trends and to develop accurate reduction targets consistent with State objectives. Finally, the inventory sets the baseline for the City to develop, evaluate, and implement strategies and actions to achieve its targets.

The GHG emissions inventory also plays a role in ensuring that the City stays on course to meet the GHG reduction targets. After the 2025 CAP is adopted, the City will continue to prepare updated GHG emissions inventories on a regular basis that will be compared to the baseline inventory. This will track the City's progress in reducing emissions as 2025 CAP measures and actions are implemented.

The GHG inventory presented in this chapter establishes 2016 as the baseline year from which the City determines GHG reduction targets. The baseline year aligns with the base year for the San Diego Association of Governments (SANDAG) travel demand model. Appendix F provides additional information on baseline year selection and inventory methodologies.

2.2. Baseline Inventory

The first step in the City's climate action planning process is to understand the sources and amount of GHG emissions generated from activities occurring within the City. A GHG emissions inventory is an estimate of the emissions of a defined set of gases (e.g., carbon dioxide [CO_2], methane [CH_4], nitrous oxide [N_2O]) that contribute to global climate change. The emissions inventory prepared for the 2025 CAP is limited to emissions that are generated from activities within the City from a defined set of sources (e.g., transportation, electricity use, and waste disposal). These include emissions that are within the City's jurisdictional control and can be readily estimated, monitored, and reduced by City action while also supporting the reduction efforts of residences and businesses.

The 2016 emissions inventory performed for the 2025 CAP evaluated emissions from the same sectors as the 2012 inventory, which are summarized in Figure 2-1 and discussed below:

- **On-road transportation** – Emissions associated with passenger cars; light-, medium-, and heavy-duty trucks; buses; motor homes; and motorcycles.
- **Electricity** – Emissions from building energy use associated with electricity in residential, commercial, and industrial buildings.
- **Natural gas** – Emissions from building energy use associated with combustion of natural gas in residential, commercial, and industrial buildings.
- **Solid waste** – Emissions from the disposal of organic materials in landfills and community-generated mixed waste from residences and business in the City.
- **Water** – Emissions associated with the energy consumed during treatment, transport, and distribution of water.
- **Off-road transportation** – Emissions from air and water vessels, recreational vehicles (e.g., golf carts, utility-terrain vehicles), landscaping equipment, and other light commercial off-road equipment.
- **Wastewater** – Fugitive emissions resulting from the treatment process for domestic sewage.

Indirect emissions are not included in the GHG emissions inventory as it is beyond the influence and operational control of the City and the 2025 CAP. Although indirect GHG emissions haven't been accounted for in the inventory, considering the impact of purchasing and other indirect activities is important for planning a holistic emissions reduction approach.

The City's previous CAPs, adopted in 2011 and 2018 included baseline GHG emissions inventories for the years 2005 and 2012, respectively using the best available data and methods at the time of completion. However, between the completion of the previous GHG inventories and the 2016 inventory developed for the 2025 CAP, data sources and methods have changed such that direct comparisons of emissions trends between the inventory years cannot be made. Further details regarding sources and methodology for the 2016 inventory can be found in Appendix F.

The 2016 inventory uses the "activity-based" approach to evaluating GHG emissions, by accounting for GHG emission-generating activities that occur within the City's geographic boundary that the City can influence through local policies and programs. This approach is the standard for developing CAPs within the California regulatory framework. However, activities within Encinitas generate GHG emissions across the globe, including but not limited to energy used to extract, transport and process raw materials and finished products that are consumed by Encinitas businesses, workers, residents, visitors. The consideration of these GHG emissions requires a "consumption-based" approach, which is not directly addressed in the 2025 CAP.

Notably, residents, businesses, and organizations make daily choices that result in GHG emissions beyond the influence of the City or the 2025 CAP. As such, community members are encouraged to engage in climate-friendly actions such as purchasing locally sourced foods and products to reduce transportation emissions or installing efficient or clean-energy appliances and infrastructure to lower energy-related emissions. The City's contribution to global climate change can be reduced through efforts at the individual level beyond what is described in the 2025 CAP.

City of Encinitas 2016 Greenhouse Gas Emissions

The 2016 GHG emissions inventory accounts for three primary GHGs: CO_2, CH_4, and N_2O; however, each GHG has varying levels of potency in the atmosphere. To simplify discussion and comparison of these emissions collectively, CAPs use a measurement referred to as carbon dioxide equivalent (CO_2e).

Breakdown of Emitting Sectors in 2016:

1. On-Road Transportation (58%)
2. Electricity (21%)
3. Natural Gas (15%)
4. Solid Waste (4%)
5. Water (1%)
6. Off-Road Transportation (1%)
7. Wastewater (1%)

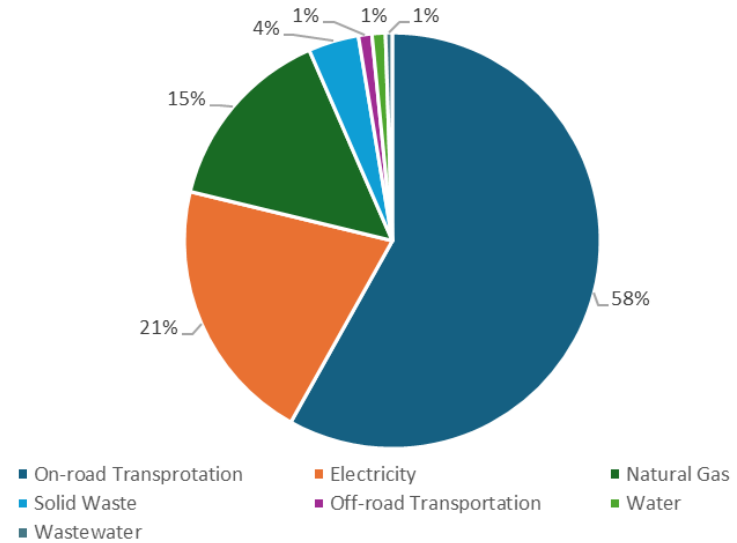
Note: Values may not add to 100% due to rounding

CO_2e translates each GHG to an equivalent volume of CO_2 by weighting it by its relative global warming potential (GWP). For example, per IPCC's Fourth Assessment Report (AR4), CH_4 and N_2O are 25 and 298 times more potent, respectively, than CO_2 in their ability to trap heat in the atmosphere (IPCC 2007). Converting these gases into CO_2e allows consideration of all the gases in comparable terms to make it easier to communicate how various sources and types of GHG emissions contribute to climate change. A metric ton of CO_2e ($MTCO_2e$) is the standard measurement of GHG emissions. While updated GWP values are available based on the most recent scientific review, including the IPCC Sixth Assessment Report, the City is continuing to use the AR4 values to align with those used in the State's GHG emissions inventories and strategies for reducing GHG emissions.

In 2016, community and municipal activities in the City generated 381,000 $MTCO_2e$. The sector with the greatest contribution to global climate change was on-road transportation, accounting for 58 percent of the City's total GHG emissions or 222,000 $MTCO_2e$. The electricity and natural gas sectors contributed 21 and 15 percent of the City's overall emissions, or 79,000 and 56,000 $MTCO_2e$, respectively.

The City's 2016 emissions are equal to combusting 42.9 million gallons of gasoline, combusting 212,000 tons of coal, and losing the carbon sequestration potential from 382,000 acres of forest.

To put these emissions into perspective, 381,000 $MTCO_2e$ is equivalent to combusting 42.9 million gallons of gasoline, combusting 212,000 tons of coal, or a year's worth of carbon sequestration from 382,000 acres of U.S. forests (U.S. Environmental Protection Agency [EPA] 2024).



Source: Energy Policy Initiatives Center (EPIC) 2024.

Figure 2-1: Greenhouse Gas Inventory for the City of Encinitas in 2016 by Emission Sector

Additional details related to the specific emission sectors, data sources, assumptions, and methods can be found in Appendix F. Figure 2-1 above and Table 2-1 below show the breakdown of the City's GHG emissions in 2016.

Table 2-1 Greenhouse Gas Inventory for the City of Encinitas in 2016 by Sector Inventory

Emissions Sector	$MTCO_2e$	Percent (%)
On-Road Transportation	222,000	58
Electricity	79,000	21
Natural Gas	56,000	15
Solid Waste	15,000	4
Off-Road Transportation	4,000	1
Water	4,000	1
Wastewater	2,000	1
Total	**381,000**	**100**

Notes: Columns may not add to totals due to rounding.

$MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Appendix F, EPIC 2025.

2.3. Emission Projections

GHG emissions projections provide an estimate for future levels based on a continuation of current trends in activity, while also accounting for known regulatory actions by federal and State agencies (i.e., "legislative" actions) that can reduce emissions in the future if implemented. Through GHG projections, communities gain insight into the scale of local reductions needed to achieve statewide GHG reduction targets, in addition to legislative actions.

The business-as-usual (BAU) GHG emissions projections in the CAP assume a continued increase in population, housing units, and vehicle activity; but a decrease in jobs. The projections are based on the City's 2021 Housing Element and 2024 Draft Mobility Element.

The first step in preparing comprehensive GHG emissions projections is the development of a BAU scenario, which assumes the continuation of conventional behaviors without the inclusion of any additional efforts or legislative actions beyond what has already been adopted at the time of the baseline year (i.e., 2016). Namely, federal, State, and local policies, programs, and regulations designed to take effect by future benchmark years (e.g., 2030, 2045), and the GHG reductions that will occur with their implementation, are not considered. The BAU model also assumes the population, housing, and transportation activity will grow over time, while the number of jobs in the City will decrease. These projections are based on the City's 2021 Housing Element and the 2024 Draft Mobility Element (Fehr & Peers 2024). Further, the BAU model does not account for GHG emissions reductions that will occur through the implementation of the 2025 CAP.

Using these parameters, BAU projections were developed for the years 2030 and 2045. GHG estimates were determined to be 370,000 $MTCO_2e$ in 2030 and 385,000 in 2045 based on analysis conducted for the 2025 CAP. Details regarding BAU assumptions and methodology can be found in Appendix F.

2.3.1. Demographic Trends

The City's population is expected to increase by 8% between 2016 and 2050.

GHG emission projections were estimated for 2030 and 2045 using City-specific demographic and vehicle travel projections based on the City's 6th Cycle Housing Element Update and the Draft Mobility Element published in September 2024. The City's population is expected to increase by 8 percent from 2016 to 2050. The City's total number of jobs is expected to decrease by 17 percent from 2016 to 2050. The City's housing stock is expected to increase by 9 percent from 2016 to 2050. Furthermore, the City's total vehicle miles traveled (VMT) is projected to increase by 22 percent from 2016 to 2050. Further details on the underlying data used for emissions projections can be found in Appendix F.

The milestone years of 2030 and 2045 were selected for BAU projections to provide a comprehensive picture of the City's short-term and long-term emissions levels without considering reductions realized through federal and State regulations. Further, 2030 and 2045 represent benchmark years in terms of achieving reduction targets that align with State legislation (i.e., 40 percent below 1990 levels of GHGs by 2030 as mandated by Senate Bill [SB] 32, at least 85 percent below 1990 levels of GHGs by 2045 as mandated by Assembly Bill [AB] 1279). As such, certain legislative-related reductions are anticipated to occur by 2030 and 2045. A BAU scenario for the years 2030 and 2045 will serve as the basis for the remainder of the climate action planning process.

2.3.2. Legislative Reductions

The second step in the climate action planning process is to model future emissions for benchmark years (i.e., 2030 and 2045) including the GHG reduction impact of legislative and local actions that have already been implemented, without consideration of additional local governmental action contained in the 2025 CAP. The legislative and local action GHG reductions accounted for in the legislative-adjusted GHG projections include:

- Federal and California Vehicle Standards
- Renewables Portfolio Standard (RPS)
  - 60 percent renewable electricity by 2030 (SB 100)
  - 90 percent renewable and zero-carbon electricity by 2035 (interim targets SB 1020)
  - 95 percent renewable and zero-carbon electricity by 2040 (interim targets SB 1020)
  - 100 percent renewable and zero-carbon electricity by 2045 (SB 100)
- California Solar Policies, Programs, and Mandates
- California Energy Efficiency Programs

A detailed description and analysis of how specific legislative reductions are included in the City's BAU GHG emissions inventory and projections can be found in Appendix F. Table 2-2 below shows the summary of the City's projected BAU GHG emissions with and without legislative action for the years 2030 and 2045.

Table 2-2 City of Encinitas Emissions Business-as-Usual and Legislative-Adjusted Projections ($MTCO_2e$/year)

Emissions Sector	2016	2030		2045	
		BAU Projection	Legislative-Adjusted Projection	BAU Projection	Legislative-Adjusted Projection
On-Road Transportation	222,000	197,000	159,000	213,000	40,000
Electricity	79,000	82,000	26,000	80,000	1,000
Natural Gas	56,000	67,000	65,000	67,000	65,000
Solid Waste	15,000	14,000	14,000	15,000	15,000
Off-Road Transportation	4,000	4,000	4,000	5,000	5,000
Water	4,000	4,000	4,000	4,000	1,000
Wastewater	2,000	2,000	2,000	2,000	2,000
Total	381,000	370,000	274,000	385,000	129,000
Change from 2016	-	-11,000	-107,000	4,000	-252,000
Change from 2016 (%)		-3%	-28%	1%	-66%

Notes: Columns may not add to totals due to rounding. BAU = business as usual, GHG = greenhouse gas emissions, $MTCO_2e$ = metric tons of carbon dioxide equivalent.

Source: Appendix F, EPIC 2025.

2.3.3. Business-as-Usual Greenhouse Gas Emissions Projections with Legislative Reductions

Implementation of the legislative actions listed above will contribute to reductions in GHG emissions in the City, as shown in Table 2-2. By 2030, emissions are projected to decline by approximately 28 percent below 2016 levels; by 2045, emissions are projected to decrease by approximately 66 percent as compared to 2016 levels. The overall decrease in emissions is because of current federal, State and local policies existing in 2024, as described in section 2.3.2.

2.4. Reduction Targets

As directed by SB 32 and AB 1279, the State aims to reduce annual statewide GHG emissions to:

- 40 percent below 1990 levels by 2030 and
- 85 percent below 1990 levels by 2045, with net-zero emissions achieved through carbon dioxide removal.

SB 32 and AB 1279 use 1990 levels as a benchmark to identify statewide reduction targets. Because the City's 1990 emissions level was not estimated, proportional targets for the City's CAP were developed from the 2016 baseline.

While State legislative targets are based on 1990 statewide GHG emissions levels, Encinitas, like most jurisdictions in California, does not have an emissions inventory from the year 1990 and must correlate a more recent inventory to 1990 levels using statewide GHG emissions data. In 2016, the State's GHG emissions inventory showed that total statewide GHG emissions levels were nearly equivalent to 1990 levels (CARB 2019). As such, it is reasonable to assume that local GHG emissions have evolved on a

similar trend, and 1990 total GHG emissions levels in Encinitas may be similar to those estimated in the 2016 community GHG inventory.

In alignment with the State targets, and estimating equivalent reductions needed from the 2016 baseline, the City aims to reduce emissions to:

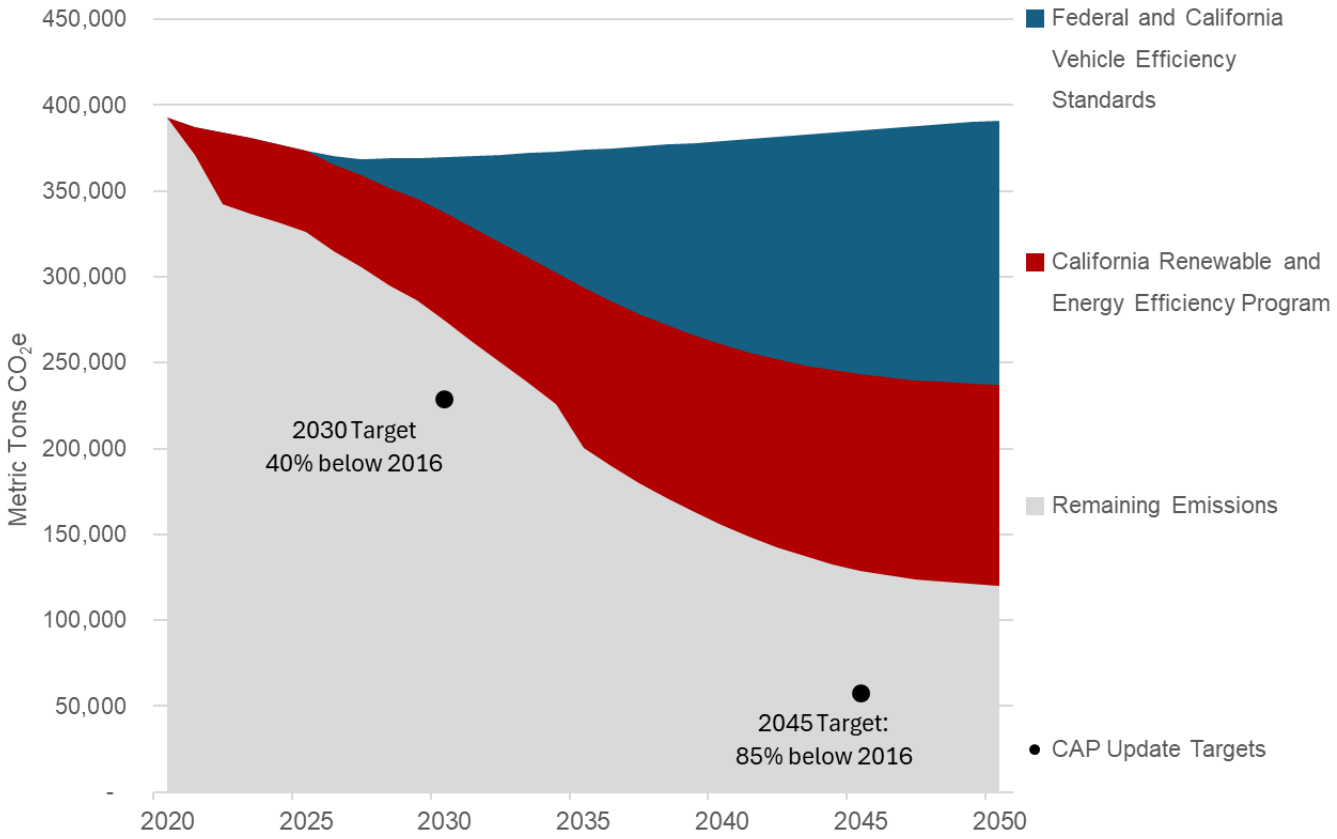
- 40 percent below 2016 levels by 2030 (aligned with the 2030 target in SB 32); and
- 85 percent below 2016 levels by 2045 (aligned with the 2045 target in AB 1279).

To reach the short-term reduction target of 40 percent below 2016 GHG emissions levels by 2030, the City will need to reduce annual emissions by 152,000 $MTCO_2e$ to 229,000 $MTCO_2e$ by 2030. To reach the long-term reduction target of 85 percent below 2016 levels by 2045, the City will need to reduce annual emissions by 324,000 $MTCO_2e$ to 57,000 $MTCO_2e$ by 2045.

The City's approach to GHG reduction targets for the 2025 CAP is focused on a reduction in anthropogenic emissions within its influence and control. A net-zero GHG goal for the year 2045 is not feasible for Encinitas based on local conditions and the current state and cost-effectiveness of available technologies. The State's strategy for meeting the AB 1279 target, as outlined in the 2022 Climate Change Scoping Plan, indicates that net-zero emissions would be achieved through CO_2 removal through both carbon sequestration in natural lands and mechanical carbon capture and storage technologies (CARB 2022). Encinitas does not have the ability to substantially increase carbon sequestration on natural lands to the levels required to offset all emissions (due to factors such as topography and lack of remaining open space) and does not have the geologic conditions needed for geologic carbon storage (DOC 2024). Additionally, CO_2 removal and carbon capture and storage technologies are being evaluated by the State, and it is not feasible for local jurisdictions, including Encinitas, to scale these mechanical solutions independently to achieve net-zero GHG emissions by 2045. As the 2025 CAP is implemented and more guidance is available from State agencies, the City will reassess the applicability and feasibility of a net-zero goal and update the 2025 CAP as appropriate.

Taking legislative reductions into account, emissions are projected to decrease in the BAU projections through 2030 and 2045 to meet the State goals. Legislative actions are expected to reduce the BAU emissions through 2030 and 2045; however, reductions in emissions through 2030 and 2045 are not, in and of themselves, enough to meet established targets.

The GHG reductions from federal and State legislation and previously implemented local actions would not be sufficient to achieve the City's 2030 and 2045 GHG reduction targets. As described in Chapter 3, to meet the City's 2030 and 2045 targets, the City will need to implement local GHG reduction strategies. A detailed technical analysis of the City's emissions reduction targets and goals can be found in Appendix F. Figure 2-2 shows the City's legislative-adjusted BAU projections alongside the City's GHG reduction targets.



Energy Policy Initiatives Center, University of San Diego 2024

Figure 2-2: BAU and Legislative-Adjusted Projections and GHG Reduction Targets

CITY OF Encinitas

CHAPTER 3

Greenhouse Gas Reduction Strategies, Goals, and Actions

This chapter outlines the strategies, goals, measures, and actions that the City of Encinitas (City) will implement to achieve its greenhouse gas (GHG) reduction targets, as outlined in Chapter 2. The strategies, goals, measures, and actions focus on locally based programs, policies, and projects that will reduce GHG emissions in various categories as a complement to legislative actions taken by the federal and State governments.

3.1. GHG Reduction Overview

Seven GHG emissions reduction strategies were identified for the 2025 CAP, which represent the primary ways to achieve GHG reductions and include:

- Building Decarbonization
- Clean and Efficient Transportation
- Renewable Energy
- Water Efficiency
- Reduce Off-Road Equipment
- Zero Waste
- Carbon Sequestration

The seven GHG emissions reduction strategies include:

- Building Decarbonization
- Clean and Efficient Transportation
- Renewable Energy
- Water Efficiency
- Reduce Off-Road Equipment
- Zero Waste
- Carbon Sequestration

Within each strategy is a set of goals, measures, primary implementation actions, and supporting actions that define the objectives, programs, policies, and projects the City will implement to reduce GHG emissions. These measures and actions mainly focus on community-scale reductions but also include local government operations. Through partnerships with and among residents, businesses, agencies, and other organizations, these measures and actions will provide net benefits for everyone.

The 2025 CAP encompasses and expands upon the GHG reduction strategies of the previous CAP by updating existing measures to achieve additional GHG reductions and adding new measures to reach the GHG emissions reduction targets established in Chapter 2. For more details on how proposed strategies, measures, and actions differ from the previous CAP, see Appendix F.

As described in Chapter 2, the City has established a 2030 GHG emissions reduction target of 40 percent below 2016 levels and a 2045 target of 85 percent below 2016 levels to reduce annual GHG emissions. Under the projected scenario that accounts for GHG reductions from legislation and past City actions, the City's GHG emissions trajectory will fall short of meeting these targets. As such, the City will need to implement additional measures to achieve its GHG reduction targets. With the strategies, measures, and actions proposed in the 2025 CAP, the City is anticipated to achieve the 2030 and 2045 targets.

Under a projected scenario that considers the effects of legislation and past local actions, the City would fall short of meeting the 2030 and 2045 targets.

Table 3-1 shows the GHG reductions attributable to the strategies included in the 2025 CAP. Table 3-2 demonstrates how the anticipated reductions will help the City meet its GHG reduction targets. Detailed calculations and description of the calculation methodologies are provided in Appendix F.

Table 3-1 GHG Reductions summarized by Strategy for 2030 and 2045 ($MTCO_2e$)		
Strategy	**2030**	**2045**
Building Decarbonization	8,000	31,400
Renewable Energy	18,500	1,000
Water Efficiency	1,000	1,000
Clean and Efficient Transportation	4,800	19,200
Zero Emission Equipment	300	1,300
Zero Waste	10,400	12,700
Carbon Sequestration	4,300	5,300
Total Reductions from Federal and State Regulations	95,300	256,500
Total Reductions (Federal, State, and Local)	142,000	328,000

Notes: Columns may not add to totals due to rounding.

$MTCO_2e$ = Metric Tons of Carbon Dioxide Equivalent

Source: Appendix F, EPIC 2025.

Table 3-2 Effect of Emissions Reductions on City of Encinitas Emissions and Target ($MTCO_2e$)		
Emissions	**2030**	**2045**
BAU Emissions Projection	**370,000**	**385,000**
Legislative Reductions	**95,000**	**257,000**
Legislative-Adjusted BAU Emissions Projection (BAU Projection – Legislative Reductions)	274,000	129,000
Baseline Emissions (2016)	381,000	381,000
City of Encinitas GHG Reduction Target (Percent below 2016)	40%	85%
Target Emissions	229,000	57,000
Reductions from 2025 CAP Measures	**47,000**	**72,000**
City of Encinitas Emissions with 2025 CAP (Legislative-Adjusted BAU – 2025 CAP Reductions)	227,000	57,000
Target Achieved?	YES	YES

Notes: Columns may not add to totals due to rounding.

$MTCO_2e$ = Metric Tons of Carbon Dioxide Equivalent

Source: Appendix F, EPIC 2025.

3.1.1. Co-benefits

While the 2025 CAP is primarily geared toward reducing GHG emissions and addressing climate change-related vulnerabilities within the City, it will also result in numerous environmental, economic, and social "co-benefits" to residents, workers and visitors. Co-benefits result from the implementation of GHG emissions reduction measures and actions and are additional positive outcomes that are not the primary intent. For example, in addition to reducing GHG emissions, implementation of a measure to encourage the installation of solar panels on buildings will also provide the co-benefit of financial savings to building owners through reduced energy costs.

Co-benefits identified in the 2025 CAP include:

- **Air Quality**: Reductions to air pollutants such as carbon monoxide, nitrogen oxides, particulate matter, and volatile organic compounds leading to cleaner and healthier indoor and outdoor environments.
- **Public Health & Safety**: Promotion of healthier lifestyles and reduced exposure to environmental pollutants and other risks to life and property.
- **Jobs and Economy**: Increased economic activity in the City, increased job availablillty, especially green jobs, and makes economic activity more environmentally sustainable.
- **Climate Resilience**: City is better prepared to quickly recover from climate hazards (e.g., extreme heat, flooding, wildfire, and drought).

3.2. GHG Reduction Framework

The 2025 CAP GHG reduction measures and actions were developed based on a combination of factors. These include:

- The feasibility of the measure and action to be implemented by the City,
- The need for greater reductions to meet GHG emissions targets, especially in categories with the most emissions (i.e., on-road transportation and natural gas),
- Existing programs, policies, or projects that can be expanded or proposed policies yet to be adopted,
- Feedback from the community and other stakeholders (e.g., City Council, Planning Commission, Environmental Commission, stakeholder interviews, and public workshops), and
- Technological innovations.

To effectively present the measures and actions that the City will undertake to reduce GHG emissions, a tabular framework was developed. The framework is organized by emissions category in the subsequent sections of this chapter. Within each category, corresponding emissions reduction strategies are presented in a table framework. Each strategy contains a broad goal or multiple goals. Each goal contains one or more measures in which the City will implement to reduce emissions. The framework consists of a total of 32 measures. Each measure contains a set of primary implementation actions and equity considerations that the City will employ to complete the measure. Within the framework, each measure also contains a quantitative performance metric and GHG reduction potential, measured in $MTCO_2e$. Finally, if relevant, supporting actions are included with each measure which further aid in emissions reductions but are not quantified. Each component of the framework is defined in further detail below:

Emissions Category	Source of GHG emissions, as defined by the City's baseline assessment. Emissions categories include: Electricity and Natural Gas, Water, Wastewater, On-Road Transportation, Off-Road Transportation, Solid Waste, and Carbon Sequestration. The emissions categories, except for Carbon Sequestration, align with the GHG emissions inventory outlined in Chapter 2. Carbon Sequestration is additionally included in this reduction strategy framework as a category by which to reduce overall emissions.
Strategy	High-level plans the City will implement to achieve GHG reductions in a specific emissions category. Each emissions category may have one or more associated strategies. The framework includes seven overall strategies.
Goal	The general objective that the City will strive to achieve within a defined strategy. Each strategy will have at least one or more goals.
Measures	Programs, policies, or projects the City will implement that will cause a *direct* and *measurable* reduction in greenhouse gas emissions.
Measure Description	Detailed description of the GHG reduction measure.
Primary Implementation Actions	Detailed actions needed to support a specific measure.
Equity Considerations	Factors that should be considered for implementation to ensure equitable outcomes and avoid unintended consequences. More information on the identification of equity considerations can be found in Appendix C.
Target Year	The year corresponding to the emissions targets set by the City and that are in line with State laws and guidelines. For the 2025 CAP, the City's target years include 2030 and 2045.
Performance Metric	Quantitative metric by which achievement of the specified goal will be measured. Each goal will have two performance metrics, one for each target year, 2030 and 2045.
GHG Reduction Potential	Estimated reduction in local greenhouse gas emissions if the performance metric is met. The reduction is presented in $MTCO_2e$ for 2030 and 2045.
Supporting Actions	Supporting actions are additional non-quantifiable actions to help the implementation of a specific strategy.
Co-benefits	Co-benefits are considered at the strategy level and discussed in more detail in Section 3.1.1.

To help meet designated targets, the 2025 CAP proposes 32 measures organized under seven strategies and six emissions categories. The following sub-sections detail GHG reduction framework according to each emissions category. A description of the emissions category is followed by separate tables describing each strategy, its goal(s), its measures, primary implementation actions, equity considerations, performance metrics, GHG reduction potential for both 2030 and 2045, supporting actions (strategy level), and co-benefits (strategy level). While many of the emissions reductions of the GHG reduction measures and actions can be quantified, others are difficult to quantify and are thus classified as "supporting actions." Supporting actions cannot be quantified because of data limitations or lack of an available methodology to quantify emissions reductions; however, the combination of all GHG reduction measures, primary implementation actions, and supporting actions contribute towards achieving 2030 and 2045 targets and are important to include.

Of the 32 measures, 12 were newly developed during the development of the 2025 CAP, while the remaining 20 measures are carried over from the previous CAP and revised to help achieve the City's updated GHG emissions reduction targets for 2030 and 2045.

Additional details and calculations on the GHG reductions measures can be found in Appendix F. Chapter 5 further describes how the measures will be implemented.

3.2.1. Electricity and Natural Gas

Electricity and natural gas consumption accounted for 36 percent of the City's total emissions in 2016. Legislative reductions from State actions and the City's participation in San Diego Community Power will reduce electricity and natural gas emissions below 2016 levels by 33 percent by 2030 and 51 percent by 2045. Emissions reductions from the Electricity and Natural Gas Category are divided into two strategies: Building Decarbonization and Renewable Energy. The success of these strategies relies on coordination with local utilities and organizations, participation from the community, and administration of new or revised local policies and programs. All Electricity and Natural Gas strategies also serve as adaptation strategies by reducing overall energy demand and increasing the ability of the community and local economy to weather future change.

Strategy 1: Building Decarbonization

The energy (electricity and natural gas) used in buildings accounts for the majority of GHG emissions in the Electricity and Natural Gas category. Although legislative reductions related to State actions will help reduce emissions associated with building energy, the City intends to work towards the decarbonization of nearly all buildings in Encinitas. Under this strategy, emissions are reduced by continuing to develop energy efficiency building codes that exceed the minimum State requirements ("reach codes") and developing programs and policies to reduce fossil fuel reliance in existing buildings. Implementation of the Building Decarbonization Strategy would reduce the City's emissions by 7,965 $MTCO_2e$ by 2030 and 31,447 $MTCO_2e$ by 2045. Table 3-3 outlines the framework for this strategy.

Co-Benefits of Building Decarbonization include:

- Air Quality
- Public Health & Safety
- Jobs & Economy
- Climate Resilience

Table 3-3 Strategy 1: Building Decarbonization

Goal 1.1: Decarbonize Homes and Businesses

Measure BD-1: Require Existing Residential Development Energy Efficiency

Readopt existing residential energy efficiency building code requirement ("reach code") via ordinance for each 3-year State Building Code cycle, if cost effective.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on new code requirements for the public and City staff.
- Implement reach code for all applicable existing residential building permit applications.

Equity Considerations

- Conduct all trainings in Spanish and English.
- Consider energy efficiency requirements for landlords to take on for low-income renters.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Energy retrofits completed at 300 homes.	16
2045	Energy retrofits completed at 800 homes.	35

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Services, Land Development & Building

Measure BD-2: Require New Residential Development Decarbonization

Readopt a decarbonization building code requirement ("reach code") via ordnance for each 3-year State Building Code cycle, if cost effective.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on new code requirements for the public and City staff.
- Implement reach code for all applicable new residential building permit applications.

Equity Considerations

- Ensure affordable housing units meet all energy efficiency and green building requirements.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	500 newly constructed all-electric homes.[1]	276
2045	1,400 newly constructed all-electric homes.[1]	733

Table 3-3 Strategy 1: Building Decarbonization

Lead Department, Division	Supporting Department(s), Divisions(s)
Development Services, Sustainability	Development Services, Land Development & Building

Measure BD-3: Require Existing Nonresidential Development Energy Efficiency

Readopt existing commercial energy efficiency building code requirement ("reach code") via ordinance for each 3-year State Building Code cycle, if cost effective.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on new code requirements for the public and City staff.
- Implement reach code for all applicable existing commercial building permit applications.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	None identified.[2]	Not quantified
2045	None identified.[2]	Not quantified

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Planning, Land Development & Building

Measure BD-4: Require New Nonresidential Development Decarbonization

Adopt new commercial building code requirement ("reach code") via ordinance for each 3-year State Building Code cycle, if cost effective.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on new code requirements for the public and City staff.
- Enforce reach code for all applicable new commercial building permit applications.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	973,500 square feet of newly constructed all-electric commercial development.[1]	591
2045	3,750,000 square feet of newly constructed all-electric commercial development.[1]	2,540

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Services, Land Development & Building

Measure BD-5: Decarbonize Existing Buildings

Develop and implement a comprehensive set of studies, programs, regulations, and incentives to work towards decarbonizing the existing building stock.

Primary Implementation Actions

- Develop and implement a revised Green Building Incentive Program to incentivize all-electric construction and conversion of existing natural gas appliances to electric appliances.
- Conduct building and housing stock analysis and assess funding gaps and timeline for existing building electrification.
- Develop a Building Benchmarking Ordinance and/or Building Performance Standard based on building stock analysis.
- Develop a Home Energy Score Program to raise awareness of energy consumption at the point of rental and sale.
- Expand energy efficiency permit fee waiver program.

Table 3-3 Strategy 1: Building Decarbonization

Equity Considerations

- Support workforce training and growth of green jobs.
- Develop pilot programs and incentives that target low-income residents.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Reduce 13% of the 2016 baseline citywide natural gas use through retrofitting existing buildings (equivalent to reducing 1.3 million therms or retrofitting 5,600 existing homes if all retrofits are in the residential sector).	7,001
2045	Reduce 50% of the 2016 baseline citywide natural gas use through retrofitting existing buildings (equivalent to reduce 5 million therms or retrofitting 22,000 existing homes if all retrofits are in the residential sector).	28,004

Lead Department, Division	Supporting Department(s)
Development Services, Sustainability	Development Services, Land Development & Building

Goal 1.2: Decarbonize Municipal Buildings and Facilities

Measure MBD-1: Implement Energy Efficiency and Decarbonization Projects at Existing Municipal Facilities

Install energy efficiency measures and electric appliances and equipment at all municipal facilities.

Primary Implementation Actions

- Complete Facilities Conditions Report and Facilities Master Plan to include quantification of energy use and identification of energy efficiency, conservation, and electric conversion opportunities.
- Identify all lighting facilities that are non-LED and develop a plan to convert all City-owned lighting to LED.
- Identify grants, rebate and incentive programs, and financing opportunities to install energy efficiency measures, all-electric appliances and equipment, and LED lighting.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Achieve 30% energy reduction below 2012 level (equivalent to 579,000 kWh electricity savings and 12,000 therms natural gas savings)	81
2045	Reduce or substitute all natural gas use at municipal facilities through energy efficiency and conservation, and all-electric appliances installation.	135

Lead Department, Division	Supporting Department(s), Division(s)
Public Works, Administration	Engineering, Capital Improvement | Fire & Marine Safety, Administration | Parks, Recreation & Cultural Arts, Administration

Measure MBD-2: Require New Municipal Facilities be All-Electric

Adopt a policy requiring the development of new municipal facilities be all electric.

Primary Implementation Actions

- Adopt an administrative policy requiring the development of new municipal facilities to be all-electric.
- Implement administrative policy as new municipal facilities are planned and constructed.

Equity Considerations

- Support workforce training and green job growth.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	New municipal facilities to be all-electric.	Not quantified[3]
2045	New municipal facilities to be all-electric.	Not quantified[3]

Table 3-3 Strategy 1: Building Decarbonization

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Engineering, Capital Improvement | Fire & Marine Safety, Administration | Parks, Recreation & Cultural Arts, Administration

Supporting Actions for Strategy 1:

- Educate homeowners about the U.S. DOE Home Energy Score Program and streamline the process of identifying energy auditing contractors.
- Support the State's efforts to enact decarbonization legislation.
- Educate homeowners and businesses on decarbonization, building electrification, and electric appliance options and related incentive programs offered by SDCP, SDG&E, and others in the region.
- Continue to track State legislation and lobby for change where proposals align with City goals and vision.

Notes: LED = light-emitting diode; $MTCO_2e$ = metric tons of carbon dioxide equivalent; SDCP = San Diego Community Power; SDG&E = San Diego Gas & Electric; U.S. DOE = United States Department of Energy.

[1] Performance metrics for all-electric building only account for buildings that are voluntarily built all-electric.

[2] Identification of a performance metric is not possible at the time of CAP development due to unavailability of cost-effectiveness studies for the 2025 Building Energy Efficiency Standards.

[3] No new municipal facilities are currently planned, and as such, GHG reductions are not quantified.

Source: Appendix F, EPIC 2025.

Strategy 2: Renewable Energy

The transition from fossil fuels to renewable energy for electricity generation will reduce emissions and provide a more sustainable and resilient source of electricity. Under this strategy, emissions are reduced by expanding participation in San Diego Community Power (SDCP) renewable energy service offerings and increasing the amount of onsite renewable energy at existing and new residential and non-residential development. Implementation of Strategy 2 would reduce the City's emissions by 18,506 $MTCO_2e$ by 2030 and 1,006 $MTCO_2e$ by 2045. Table 3-4 outlines the framework for this strategy.

Co-Benefits of Renewable Energy include:
- Air Quality
- Public Health & Safety
- Jobs & Economy

Table 3-4 Strategy 2: Renewable Energy

Goal 2.1: Achieve 100 Percent Renewable Electricity Supply in Homes and Businesses

Measure RE-1: Maintain Membership in San Diego Community Power

Continue to offer Power100 as the primary electricity rate for Encinitas customers and maintain participation rate through outreach and education.

Primary Implementation Actions

- Partner with San Diego Community Power on educational programs to encourage residents and businesses to opt-up or remain enrolled in the Power100 service offering.

Equity Considerations

- Promote low-income rate programs from SDCP.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Maintain SDCP Power100 as the City's primary electricity option. Maintain primary electricity option participation rate at or above 93 percent.	18,267
2045	Maintain SDCP Power100 as the City's primary electricity option. Maintain primary electricity option participation rate at or above 93 percent.	0

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	City Manager's Office

Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems

Readopt existing nonresidential solar photovoltaic (PV) system building code requirement ("reach code") via ordinance for each 3-year State Building Code cycle.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on new code requirements for the public and City staff.
- Enforce reach code for all applicable nonresidential building permit applications.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	0.6 MW of solar PV system capacity added through nonresidential additions or alterations.	239
2045	0.6 MW of solar PV system capacity added through nonresidential additions or alterations.	665

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Planning, Land Development & Building

Table 3-4 Strategy 2: Renewable Energy

Goal 2.2: Increase Renewable Electricity Supply in Municipal Operations

Measure MRE-1: Install Microgrids with On-site Renewable Generation and Battery Storage at Existing Municipal Facilities

Complete a feasibility study and install on-site renewable microgrids at suitable municipal facilities.

Primary Implementation Actions

- Complete Facilities Master Plan to determine opportunities for energy storage, on-site renewable generation, and microgrids at municipal facilities and sites, including parking lots.
- Identify grants, rebate and incentive programs, and financing opportunities to implement capital improvement project(s) to install microgrids at suitable facilities.
- Design and install energy storage, on-site renewable generation, and microgrid projects for municipal facilities and sites.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Complete Facilities Master Plan.	0
2045	Install 850 kW of on-site renewable generation with energy storage at municipal facilities.	341

Lead Department, Division	Supporting Department(s), Division(s)
Public Works, Administration	Engineering, Capital Improvement | Fire & Marine Safety, Administration | Parks, Recreation & Cultural Arts, Administration

Measure MRE-2: Require New Municipal Facilities to Install Microgrids with On-Site Solar and Battery Storage

Adopt a policy requiring the development of new municipal facilities to include microgrids.

Primary Implementation Actions

- Adopt an administrative policy requiring the development of new municipal facilities to install microgrids with on-site solar and battery storage.
- Implement administrative policy as new municipal facilities are planned, designed, and constructed.

Equity Considerations

- Support workforce training and growth of green jobs.
- Supports the extended use of municipal facilities as emergency shelters during power outages.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	All new municipal facilities to install microgrids.	Not quantified[1]
2045	All new municipal facilities to install microgrids.	Not quantified[1]

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Public Works, Administration | Engineering, Capital Improvement | Fire & Marine Safety, Administration | Parks, Recreation & Cultural Arts, Administration

Notes: kW = kilowatt; $MTCO_2e$ = metric tons of carbon dioxide equivalent; MW = megawatt; PV = photovoltaic; SDCP = San Diego Community Power.

Source: Appendix F, EPIC 2025.

3.2.2. Water

GHG emissions are produced through the energy used to pump, transport, and treat water and wastewater. Although water and wastewater-related GHG emissions only accounted for two percent of the City's emissions in 2016, water conservation is needed to address serious periodic drought issues that frequently affect the City and the State. As discussed in Chapter 4, drought conditions could increase in frequency and severity because of climate change over the long-term. All water strategies also serve as adaptation strategies by preserving water quality and encouraging water conservation.

Strategy 3: Water Efficiency

Water and wastewater-related measures under this strategy will reduce both the strain on water supplies and GHG emissions from pumping and treatment activities. Strategy 3 focuses on reducing water consumption citywide through education and outreach, building codes, and converting City-managed landscaping to be drought tolerant. Emission reductions from the Water Efficiency Strategy rely on successful coordination with and participation from San Dieguito Water District, Olivenhain Municipal Water District, City residents, and businesses. Implementation of Strategy 3 would reduce the City's emissions by 1,640 and 1,576 $MTCO_2e$ by 2030 and 2045, respectively. Table 3-5 outlines the framework for this strategy.

Co-Benefits of Water Efficiency include:
- Jobs & Economy
- Climate Resilience

Table 3-5 Strategy 3: Water Efficiency

Goal 3.1: Reduce City-wide Potable Water Consumption		
Measure WE-1: Support Local Water Districts' Water Conservation Efforts		
Educate residents on the importance of water conservation and offer incentives to reduce water use.		
Primary Implementation Actions		
▪ Continue to support local water districts' efforts to incentivize water conservation through rebates and free water audits. ▪ Collaborate with local water districts to provide education and outreach to property owners on water conservation and drought-tolerant landscaping. ▪ Educate homeowners and businesses about water efficiency rebate and incentive programs offered to SDWD and OMWD customers. ▪ Enforce the Water Supply Shortage Response Program ordinances (administered by SDWD and OMWD) which require citywide water conservation during drought conditions.		
Equity Considerations		
▪ Work with water districts to create low-income rate programs.		
Target Year	**Performance Metric**	**GHG Reduction Potential ($MTCO_2e$)**
2030	Reduce potable water use to 8,700 AF (99 GPCD).	955
2045	Reduce potable water use to 8,900 AF (97 GPCD).	879
Lead Department, Division	**Supporting Department(s), Division(s)**	
San Dieguito Water District, Olivenhain Municipal Water District	None identified	

Table 3-5 Strategy 3: Water Efficiency

Measure WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems

Continue to implement the existing building code requiring greywater systems at new single-family homes and readopt the code requirement ("reach code") via ordinance for each 3-year State Building Code cycle.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on code requirements for the public and City staff.
- Enforce reach code for all applicable residential permit applications.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	180 new homes pre-plumbed for greywater systems.	8
2045	370 new homes pre-plumber for greywater systems.	20

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Services, Land Development & Building

Measure MWE-1: Convert City-Owned Landscape to Drought Tolerant or Native Species

Identify locations within parks and the public right-of-way to convert landscaping to drought tolerant or native species.

Primary Implementation Actions

- Identify locations within public parks and the public right-of-way to convert landscaping to drought tolerant or native species.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Convert 5% public parks and right-of-way landscaping to drought tolerant or native species (equivalent to 90 acre-feet water use reduction)	34
2045	Convert 15% public parks and right-ofway landscaping to drought tolerant or native species (equivalent to 260 acre-feet water use reduction)	101

Lead Department, Division	Supporting Department(s), Division(s)
Parks, Recreation & Cultural Arts, Administration	Public Works, Street Maintenance

Supporting Actions for Strategy 3:

- Convert all current municipal landscape adjacent to recycled water pipelines to recycled water. Look for opportunities to work with the San Elijo Joint Powers Authority to extend recycled water pipelines to additional municipal facilities, when economically viable.
- The City's Clean Water Program will continue to be actively involved in the Carlsbad Watershed Water Quality Improvement Plan development and implementation.
- Work with developers to implement Low Impact Development and other stormwater features on new and redevelopment projects.
- Enforce Water Efficient Landscape requirements at new developments.
- Evaluate reducing the landscape area thresholds for projects to meet regulations outlined in the City's existing Water Efficient Landscape Ordinance.

Notes: AF = acre-feet; GPCD = gallons per capita per day; SDWD = San Dieguito Water District; $MTCO_2e$ = metric tons of carbon dioxide equivalent; OMWD = Olivenhain Municipal Water District.

[1] No new municipal facilities are currently planned, and as such, GHG reductions are not quantified,

Source: Appendix F, EPIC 2025.

3.2.3. On-Road Transportation

Internal combustion from on-road transportation is the largest contributor to the City's GHG emissions, accounting for 58 percent of the City's total emissions in 2016. Legislative reductions from

improvements in State and federal vehicle fuel efficiency standards and zero-emission vehicle sales mandates will contribute to reducing transportation emissions. While these legislative reductions apply to the fuel efficiency of vehicle operations, strategies that affect the frequency or distance of vehicle travel are within local or regional control and can be addressed in a local CAP.

Strategy 4: Clean and Efficient Transportation

Under this strategy, emissions are reduced by encouraging the use of electric and alternative fuel vehicles, and reducing vehicle miles traveled (VMT) through smarter land use planning. Emissions reductions from this strategy rely on coordination with, and participation from local and regional transportation and planning agencies, residents, and businesses. Implementation of the Clean and Efficient Transportation Strategy would reduce the City's emissions by 3,997 and 18,053 $MTCO_2e$ by 2030 and 2045, respectively. Table 3-6 outlines the framework for this strategy.

Co-Benefits of Clean and Efficient Transportation include:
- Air Quality
- Public Health & Safety
- Jobs & Economy

Table 3-6 Strategy 4: Clean and Efficient Transportation

Goal 4.1: Reduce Vehicle Miles Traveled

Measure CET-1: Implement the Active Transportation Plan

Continue to implement the citywide Active Transportation Plan (ATP) based on the Modal Alternatives Project (MAP) prioritization.

Primary Implementation Actions

- Identify grants, rebate and incentive programs, and financing opportunities for funding bicycle and pedestrian infrastructure projects and programs.
- Design and construct capital improvement projects (CIP) to install bike and pedestrian facilities identified in the ATP and prioritized in the MAP.
- Continue to utilize the locally adopted National Association of City Transportation Officials Urban Bikeway Design Guide in CIP roadway projects.
- Install traffic infrastructure enhancements that support biking and walking. This could include bike sensors and associated street markings to indicate the location of the sensor, pedestrian detectors at intersections, cross walks, traffic bollards, etc.
- Install wayfinding signage and information systems to facilitate walking, biking, and efficient driving and parking as part of CIP projects.
- Monitor usage once new bicycle and pedestrian facilities are installed.

Equity Considerations

- Ensure active transportation plan adequately connects lower-income neighborhoods.
- Include workforce development and green jobs in ATP build out.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Implement 25% of projects in the ATP.	858
2045	Implement all projects in the ATP.	1,204

Table 3-6 Strategy 4: Clean and Efficient Transportation

Lead Department, Division	Supporting Department(s), Division(s)
Engineering, Capital Improvement	Engineering, Traffic Engineering

Measure CET-2: Implement a Flexible Fleet Program

Conduct a study to determine a recommended flexible fleet option for the City and implement the recommended system.

Primary Implementation Actions

- Explore sub-regional or local flexible fleet options with regional transportation agencies (e.g., SANDAG and NCTD). and neighboring jurisdictions (Carlsbad, Solana Beach, San Marcos, San Diego County, etc.) as well as local school districts (SDUHSD and EUSD) to discuss student accessibility.
- Complete a study to determine the optimal type of flexible fleet system (e.g., micro-transit or neighborhood electric vehicle shuttles) for the City.
- Seek funding to implement the study's recommended flexible fleet system.

Equity Considerations

- Engage disadvantaged community members and organizations in the flexible fleet study to understand their transportation needs and habits.
- Ensure connectivity of low-income neighborhoods is prioritized in flexible fleet programming.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Implement a flexible fleet program as identified in most recent studies.	150
2045	Implement a flexible fleet program.	62

Lead Department, Division	Supporting Department(s), Division(s)
City Manager	Development Services, Sustainability

Measure CET-3: Require Transportation Demand Management Programs for New Residential, Nonresidential, and Major Redevelopment Projects

Require new developments to create and implement transportation demand management strategies to mitigate traffic impacts of project.

Primary Implementation Actions

- Adopt a building code requiring that large new developments create and implement transportation demand management strategies to mitigate traffic impacts of their project in accordance with the City's Mobility Element and VMT guidelines.
- Prepare and maintain a list of common TDM activities for businesses to streamline preparation of TDM plans.
- Connect businesses with SANDAG's Sustainable Transportation Services programs for its Employer Commuter Program free assistance.
- Implement TDM code for all applicable development permit applications.

Equity Considerations

- Require equity measures in TDM programs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	1,400 new Encinitas Commuters Using Alternative Modes to Work	1,556
2045	7,500 new Encinitas Commuters Using Alternative Modees to Work	3,430

Lead Department, Division	Supporting Department(s), Division(s)
Engineering, Land Development Engineering	Development Services, Policy Planning & Housing

Measure CET-4: Reduce Vehicle Miles Traveled

Develop and implement a comprehensive set of studies, programs, and regulations to work towards a citywide VMT reduction.

Primary Implementation Actions

- Develop a policy requiring projects with a significant and unavoidable VMT impact to mitigate VMT by constructing a priority mobility project, called a VMT Exchange Program.

Table 3-6 Strategy 4: Clean and Efficient Transportation

- Implement VMT Exchange Program for all applicable development permit applications.
- Develop additional programs and regulations aimed at reducing citywide VMT.

Equity Considerations

- Ensure priority mobility projects adequately and safely connect low-income populations.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	None identified.	0
2045	Reduce VMT per capita to 20% below 2016 level (3.8 per miles per day).	13,014

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Policy Planning & Housing	None.

Goal 4.2: Reduce On-road Fuel Use

Measure CET-5: Improve Traffic Flow

Improve traffic flow by retiming traffic signals and installing roundabouts at key intersections in the City.

Primary Implementation Actions

- Periodically evaluate traffic light timing and adjust timing to improve vehicular flow, as needed.
- Identify grants, rebate and incentive programs, and financing opportunities to install roundabouts.
- Design and construct capital improvement projects to install roundabouts.

Equity Considerations

- None identified.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Nine roundabouts completed. 60 intersections with traffic signal retimed.	1,902
2045	17 roundabouts completed. 60 intersections with traffic signal retimed.	1,136

Lead Department, Division	Supporting Department(s), Division(s)
Engineering, Capital Improvement	Engineering, Traffic Engineering

Goal 4.3: Increase Electric Vehicle Adoption

Measure CET-6: Require Residential Electric Vehicle Charging Stations

Continue to implement the existing building code requiring residential electric vehicle charging and readopt the code requirement ("reach code") via ordinance for each 3-year State Building Code cycle, as applicable.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on code requirements for the public and City staff.
- Implement reach code for all applicable residential permit applications.

Equity Considerations

- Ensure affordable housing units also comply with electric vehicle charging requirements.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	375 residential permits approved with electric vehicle charging station equipment required.	0[1]
2045	Require and approve electric vehicle chargers at applicable residential development projects, in alignment with future Housing Element updates.	0[1]

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Services, Land Development & Building

Table 3-6 Strategy 4: Clean and Efficient Transportation

Measure CET-7: Require Nonresidential Electric Vehicle Charging Stations

Continue to implement the existing building code requiring nonresidential electric vehicle charging infrastructure and readopt the code requirement ("reach code") via ordinance for each 3-year State Building Code cycle, as applicable.

Primary Implementation Actions

- Develop a reach code for City Council consideration and adoption.
- Conduct training on code requirements for the public and City staff.
- Implement reach code for all applicable nonresidential permit applications.

Equity Considerations

- Promote low-income electric vehicle incentive programs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	70 nonresidential permits approved with electric vehicle charging station equipment required.	0[1]
2045	Require and approve electric vehicle chargers at applicable nonresidential development projects.	0[1]

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Development Services, Land Development & Building

Goal 4.4: Zero-Emission Municipal Fleet

Measure MCET-1: Transition to Zero-Emission Vehicle (ZEV) Municipal Fleet

Continue to convert city-owned gasoline-fueled cars and light-duty trucks to zero-emission vehicles and purchase renewable diesel for all diesel-fueled heavy-duty trucks.

Primary Implementation Actions

- Continue to implement the established Zero Emission Vehicle Fleet Conversion Plan.
- Purchase EV fleet vehicles to replace gas and diesel fueled vehicles based on plan.
- Purchase and install EV charging stations for fleet.
- Purchase renewable diesel for diesel-fueled heavy-duty trucks and equipment.

Equity Considerations

- None identified.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	50 percent fleet light-duty vehicles and trucks to be ZEVs. Maintain 100 percent of fleet heavy-duty vehicles renewable diesel use.	265
2045	100 percent fleet light-duty vehicles and trucks to be ZEVs. Maintain 100 percent of fleet heavy-duty vehicles renewable diesel use.	288

Lead Department, Division	Supporting Department(s), Division(s)
Public Works, Administration	Fire & Marine Safety, Administration

Goal 4.5: Reduce City Employee Commute Trips

Measure MCET-2: Implement a Municipal Employee Transportation Demand Management Program

Develop and implement a program to incentivize City employees commuting to work by alternative transport as a model for other local employers.

Primary Implementation Actions

- Expand the City employee transit rebate program to also include incentives to commute by bicycle, walking, carpooling, rideshare, or electric vehicle.

Equity Considerations

- None identified.

Table 3-6 Strategy 4: Clean and Efficient Transportation

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	110 City employees are eligible for telework.	62
2045	110 City employees are eligible for telework. Increase the number of City employees commute alternatively to work by 20% to 26 employees.	26

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Human Resources

Measure MCET-3: Install Public Electric Vehicle Charging Stations

Install publicly available electric vehicle charging stations in municipally owned parking lots and encourage nonresidential property owners to install electric vehicle charging stations, in accordance with the EV Charging Station Master Plan.

Primary Implementation Actions

- Implement the adopted Electric Vehicle Charging Station Master Plan.
- Identify grants, rebate and incentive programs, and financing opportunities for installing public EV charging stations at public facilities.
- Encourage and support nonresidential property owners to install EV charging stations.
- Establish and implement capital improvement project(s) to install public EV charging.
- Implement educational activities to raise awareness about EVs among residents and businesses.

Equity Considerations

- Promote low-income electric vehicle incentive programs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Install 113 publically available Level 2 electric vehicle chargers and 15 DC fast chargers.	0[1]
2045	Install publically available electric vehicle charging stations consistent with Advanced Clean Cars II Regulation, or future State legislation.	0[1]

Lead Department, Division	Supporting Department(s), Division(s)
Engineering, Capital Improvement	Development Services, Sustainability | Public Works, Administration | Parks, Recreation & Cultural Arts, Administration

Supporting Actions for Strategy 4:

- Continue to implement a Complete Streets Policy.
- Consider bike sharing programs for the community.
- Complete Safe Routes to Schools projects to decrease the need to drive students to school.
- Coordinate with regional transit authorities and local school districts to improve student busing and public transit options.
- Support and promote SANDAG's Sustainable Transportation Services Program.
- Continue to utilize the locally adopted National Association of City Transportation Officials Urban Bikeway Design Guide in CIP roadway projects.
- Implement and enforce the City's Housing Element and existing specific plans to reduce VMT and encourage dense, infill development.
- Install traffic infrastructure enhancements that support biking and walking which may include, but not limited to, bike sensors and associated street markings to indicate the location of the sensor, pedestrian detectors at intersection, cross walks, and traffic bollards.
- Implement a monitoring program for assessing biking, walking, and transit ridership in the City to determine the baseline level of travel and facilitate the development of appropriate mode shift targets for the City.
- Develop, adopt, and implement a "no idling" policy.
- Encourage nonresidential property owners to install EV charging stations in accordance with the adopted Electric Vehicle Charging Station Master Plan to increase the use of zero-emission vehicles by the community.
- Pursue partnerships with school districts and NCTD to explore the use of electric busing or public transit busing for schools.
- Install wayfinding signage and information systems to facilitate walking, biking, and efficient driving and parking as part of CIP projects.
- Implement educational activities to raise awareness about EVs among residents and businesses.
- Educate community on alternative commuting resources.
- Consider providing e-bikes for City employee bikeshare program.

Table 3-6 Strategy 4: Clean and Efficient Transportation

Notes: ATP = Active Transportation Plan; CIP = Capital Improvement Program; EUSD = Encinitas Union School District; EV = electric vehicle; NCTD = North County Transit District; MAP = Modal Alternatives Project; $MTCO_2e$ = metric tons of carbon dioxide equivalent; SANDAG = San Diego Association of Governments; SDUHSD = San Dieguito Union High School District; TDM = transportation demand management; VMT = vehicle miles traveled; ZEV = zero-emission vehicle.

[1] Additional GHG reductions are not quantified for Measures CET-6, CET-7, and MCET-3 as they are supportive of the State's implementation of the Advanced Clean Cars II regulation. The GHG reductions associated with implementation of Advanced Clean Cars II and the resulting increase in ZEVs in the statewide vehicle fleet is considered in the legislative-adjusted business-as-usual GHG emissions forecast.

Source: Appendix F, EPIC 2025.

3.2.4. Off-Road Transportation

In the context of climate action planning, off-road transportation refers to vehicles and machinery designed for use in areas without paved roads, such as forests, deserts, mountains, and construction sites. These include all-terrain vehicles (ATVs), snowmobiles, dirt bikes, agricultural and construction equipment. As it relates to climate action, off-road transportation is significant because it often relies on less efficient two-stroke engines fueled by diesel or gasoline, significantly contributing to greenhouse gas emissions and air pollution. Efforts to address climate change in this context involve promoting the use of more fuel-efficient, hybrid, or electric off-road vehicles or equipment, implementing stricter emissions standards, and developing alternative fuels. In a suburban, predominantly residential city like Encinitas, the most prominent source of emissions from off-road transportation comes from yard maintenance equipment such as lawn mowers, leaf blowers, weed and hedge trimmers, chainsaws and power washers.

Off-road transportation accounted for one percent of the City's total emissions in 2016. Transitioning from fossil-fuel based to renewable or electric off-road equipment is a key strategy for reducing emissions.

Strategy 5: Zero Emission Equipment

Under this strategy, emissions are reduced by eliminating the use of two-stroke engine leaf blowers and other landscaping equipment, which are known to emit a number of air pollutants. Emissions reductions from this strategy rely on enforcement of the City's existing gas-powered leaf blower ordinance and adoption of additional gas-powered landscaping equipment ordinances. The success of the strategy relies on comprehensive public outreach and education on alternatives to gas-powered leaf-blowing technologies, as well as the availability of rebates and incentives. Implementation of the Zero Emission Equipment Strategy would reduce the City's emissions by 250 $MTCO_2e$ by 2030 and 1,290 $MTCO_2e$ by 2045. Table 3-7 outlines the framework for this strategy.

Co-Benefits of Off-Road Equipment Reduction include:
- Public Health & Safety
- Air Quality

Table 3-7 Strategy 5: Zero Emission Equipment

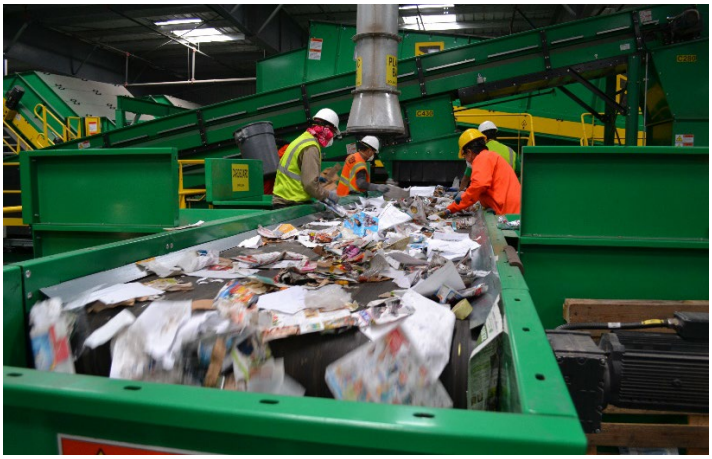
Goal 5.1: Reduce Equipment Fuel Use
Measure ZE-1: Limit Use of Gas-Powered Leaf Blowers
Enforce existing ordinance restricting the use of gas-powered leaf blowers.
Primary Implementation Actions
▪ Continue to enforce the City's Leaf Blower Ordinance which bans the use of gas-powered leaf blowers citywide. ▪ Continue to educate residents and businesses about the City's leaf blower regulations.
Equity Considerations
▪ Promote incentive programs for trading in gas-powered leaf blowers.

Table 3-7 Strategy 5: Zero Emission Equipment		
Goal 5.1: Reduce Equipment Fuel Use		
Target Year	**Performance Metric**	**GHG Reduction Potential ($MTCO_2e$)**
2030	100 percent reduction in emissions from gas-powered leaf blowers.	250
2045	100 percent reduction in emissions from gas-powered leaf blowers.	247
Lead Department, Division	**Supporting Department(s), Division(s)**	
Development Services, Development Planning & Code Enforcement	None.	
Measure ZE-2: Limit Use of Gas-Powered Landscape Equipment		
Adopt an ordinance restricting the use of gas-powered landscape equipment.		
Primary Implementation Actions		
▪ Develop an ordinance restricting the use of gas-powered landscape equipment for City Council consideration and adoption. ▪ Develop a rebate program to incentivize and accelerate replacement of gas-powered landscape equipment with electric models. ▪ Educate residents and businesses about alternatives to gas-powered landscaping equipment. ▪ Enforce the adopted ordinance.		
Equity Considerations		
▪ Promote incentive program for trading in gas-powered equipment.		
Target Year	**Performance Metric**	**GHG Reduction Potential ($MTCO_2e$)**
2030	None identified.	0
2045	100 percent reduction in emissions from gas-powered landscape equipment.	1,043
Lead Department, Division	**Supporting Department(s)**	
Development Services, Sustainability	Development Services, Development Planning & Code Enforcement	

Notes: $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Appendix F, EPIC 2025.

3.2.5. Solid Waste



The solid waste category accounted for approximately 4 percent of the City's total emissions in 2016. The Zero Waste Strategy aims to reduce emissions through diverting solid waste from landfills. Solid waste disposal in a landfill generates emissions of GHGs through the anaerobic decomposition of organic products. To reduce these emissions, methane-generating organic material must be diverted away from landfills to where they can properly decompose and emissions can be captured. Solid waste emissions reductions depend on the expansion of City programs that promote waste reduction, recycling, and organics diversion, as well as participation from City residents and businesses to reduce waste sent to the landfill, increase recycling, and divert organic waste.

Strategy 6: Zero Waste

The Zero Waste Strategy focuses on diverting a greater percentage of waste from landfills, through programs to enhance education and expand resources that support the diversion of organic waste and recyclables by residents and businesses. Implementation of Strategy 6 would reduce the City's emissions by 10,357 $MTCO_2e$ by 2030 and 12,694 $MTCO_2e$ by 2045. Table 3-8 outlines the framework for this strategy.

Co-Benefits of Zero Waste include:
- Air Quality
- Public Health & Safety
- Jobs & Economy

Table 3-8 Strategy 6: Zero Waste

Goal 6.1: Divert Solid Waste		
CAP Measure ZW-1: Implement a Zero Waste Program		
Implement a Zero Waste Program to reduce waste disposal from residents and businesses in the community.		
Primary Implementation Actions		
▪ Implement an Organic Waste Recycling Program, including adherence to SB 1383 regulations. ▪ Continue to provide Zero Waste education and outreach to residents through the City's social media outlets and website. ▪ Continue to support Zero Waste Programs at local schools. ▪ Implement audit and inspection program at commercial and multi-family facilities to ensure compliance with SB 1383 and local ordinance (E.M.C. 11.23). ▪ Establish programs to maximize procurement of recovered organic waste products to comply with SB 1383 regulations. ▪ Provide organic waste collection at City facilities and events. ▪ Continue to implement an edible food recovery program. ▪ Provide tools to inform proper recycling practices for all waste generators. ▪ Incorporate inspection component into City's Construction and Demolition Recycling program to ensure compliance with SB 1383 and local ordinance (E.M.C. 11.22). ▪ Support product stewardship and extended producer responsibility initiatives. ▪ Continue to utilize online permitting system to eliminate paper waste and seek additional opportunities to reduce paper waste in City processes. ▪ Update and implement the Environmentally Preferable Purchasing Policy.		
Equity Considerations		
▪ Promote incentive and rebate programs for low-income, multi-family, and senior populations, etc.		
Target Year	**Performance Metric**	**GHG Reduction Potential ($MTCO_2e$)**
2030	80 percent waste diversion (3 lbs/person/day).	10,357
2045	90 percent waste diversion (1.5 lbs/person/day).	12,694
Lead Department, Division	**Supporting Department(s), Division(s)**	
Public Works, Trash & Recycling	None.	

Notes: lbs = pounds; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Appendix F, EPIC 2025.

3.2.6. Carbon Sequestration

Carbon sequestration refers to the process of removing atmospheric carbon dioxide (CO_2) through artificial or natural processes and occurs daily through the natural respiration of vegetation and trees. Carbon sequestration potential is lost when natural carbon sinks (e.g., trees, seaweed, seagrasses) are cut down or removed. Conversely, a community can enhance or improve its carbon sequestration potential by increasing the volume and rate of planting trees, nurturing an urban canopy, or restoring or protecting aquatic carbon sinks.

Strategy 7: Carbon Sequestration

Co-Benefits of Carbon Sequestration include:
- Air Quality
- Public Health & Safety
- Jobs & Economy
- Climate Resilience

As part of the natural carbon cycle, plants photosynthesize, taking in CO_2 from the atmosphere and converting it into oxygen and carbon-based plant matter, storing the carbon captured from the atmosphere. Trees are significant sources of carbon storage and sequestration because of their size and longevity. Trees also provide essential habitat for local fauna. The most recent urban tree canopy assessment in the San Diego region was completed in 2014, based on high-resolution Light Detection and Ranging (LiDAR). It showed the City had approximately 22 percent existing urban tree canopy cover.[3] This strategy focuses on the preservation and expansion of tree growth in the City to increase the amount of carbon sequestered in hopes of offsetting CO_2 emissions generated by other sources to the extent feasible. The Carbon Sequestration Strategy also includes updated measurements of tree canopy to create more up-to-date tree canopy targets. Increased carbon sequestration and new tree plantings will improve air quality through the capture of air pollutants, improve water quality through reduced erosion, benefit biological resources by providing additional habitat and improved water quality, and benefit the community and public health through the provision of shade and positive impacts on mental health. Implementation of the Carbon Sequestration Strategy would reduce the City's emissions by 4,297 $MTCO_2e$ by 2030 and 5,273 $MTCO_2e$ by 2045. Table 3-9 outlines the framework for this strategy.

Table 3-9 Strategy 7: Carbon Sequestration

Goal 7.1: Increase Urban Tree Cover
Measure CS-1: Establish a Tree Canopy Goal for the City
Evaluate the City's current urban tree canopy and establish a goal for increasing the City's urban tree canopy.
Primary Implementation Actions
▪ Using the most recent LiDAR and aerial imagery, determine the City's current urban tree canopy and estimate the City's urban tree canopy potential. ▪ Establish a realistic tree canopy goal based on the analysis, targeting a 5 percent increase in tree canopy, if possible.
Equity Considerations
▪ Prioritize tree planting in heat-vulnerable neighborhoods based on climate impact assessment.

[3] The assessment was done in 2014 for all urban areas in the San Diego County using method developed by University of Vermont and USDA Forest Service. https://www.sandiego.gov/sites/default/files/san_diego_tree_canopy_assessment_05oct2016.pdf

Table 3-9 Strategy 7: Carbon Sequestration

Goal 7.1: Increase Urban Tree Cover

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Maintain current tree canopy.	4,096
2045	Increase tree canopy by 5 percent or other percentage as determined by the study.	4,841

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	Public Works, Parks, Recreation & Cultural Arts

Measure CS-2: Enforce Landscape Tree Requirements at New Developments

Continue to implement the City's current tree and landscape requirements.

Primary Implementation Actions

- Enforce parking area tree planting requirement (E.M.C. 30.54.060): a minimum of one tree for every five parking spaces.
- Monitor and track all new trees planted at private properties and parking lots.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	3,200 new trees planted at private properties and parking lots.	117
2045	6,800 new trees planted at private properties and parking lots.	242

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Development Planning & Code Enforcement	None.

Measure CS-3: Incentivize Tree Planting on Private Property

Incentivize tree planting on private property through a free tree giveaway program.

Primary Implementation Actions

- Collaborate with regional tree experts to develop a tree give-away program or other incentives to encourage planting of shade trees at existing residential and non-residential sites.
- Continue to share related informational materials on City's webpage and at other community events on shade tree planting guides, preferred trees list, and tree giveaways.
- Incentivize tree planting on private property by giving away tree seedlings during Arbor Day events.

Equity Considerations

- Prioritize tree planting incentives to low-income and disadvantaged populations and areas with greater climate adaptation needs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Give away 500 total trees for residents and businesses to plant on private property (100 trees per year).	18
2045	Give away 2,000 total trees for residents and businesses to plant on private property (100 trees per year).	71

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Sustainability	None.

Measure CS-4: Adopt and Implement a Mature Tree Ordinance

Adopt and implement a Mature Tree Ordinance with new replacement ratio based on replacement tree locations and species for new multi-family developments, new nonresidential or mixed-use developments, and redevelopment of existing nonresidential and multi-family properties.

Primary Implementation Actions

- Develop requirements aimed at preserving mature trees on development sites or replacing mature trees when removal is unavoidable.

Table 3-9 Strategy 7: Carbon Sequestration

Goal 7.1: Increase Urban Tree Cover

- Implement mature tree guidelines for all applicable building permit applications.

Equity Considerations

- None identified.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	None identified.	Not quantified.
2045	None identified.	Not quantified.

Lead Department, Division	Supporting Department(s), Division(s)
Development Services, Policy Planning & Housing	Development Services, Development Planning & Code Enforcement

Measure MCS-1: Plant and Maintain City Trees

Plant and maintain City trees in accordance with the City's Urban Forest Management Plan.

Primary Implementation Actions

- Continue to plant new trees in the City by identifying right of way and park land that have space for additional trees.
- Replace any trees that are removed due to death or disease.
- Identify grants, rebate and incentive programs, and financing opportunities to plant additional trees on City properties.
- Specify trees as part of Capital Improvement Projects.

Equity Considerations

- Support workforce training and growth of green jobs.

Target Year	Performance Metric	GHG Reduction Potential ($MTCO_2e$)
2030	Plant and maintain an average of 1,900 net new tree to city's tree inventory.	66
2045	Plant and maintain an average of 3,400 net new tree to city's tree inventory.	119

Lead Department, Division	Supporting Department(s), Division(s)
Public Works, Street Maintenance	Parks, Recreation & Cultural Arts, Parks Beaches and Trails

Supporting Measures Actions for Strategy 7:

- Continue turf management practices which specify the top-dressing of compost to increase carbon sequestration at City parks.
- Partner with schools to develop programs to educate students about planting trees.
- Continue to encourage developers to avoid the removal of any mature trees when a property is developed or redeveloped.
- Incentivize tree planting on private property by giving away tree seedlings during Arbor Day events.
- Support regional LiDAR imagery data collection.
- Encourage and support resource management agencies in exploring enhanced lagoon carbon sequestration in San Elijo and Batiquitos Lagoons.

Notes: LiDAR = Light Detection and Ranging; $MTCO_2e$ = metric tons of carbon dioxide equivalent

Source: Appendix F, EPIC 2025.

CHAPTER 4

Climate Adaptation

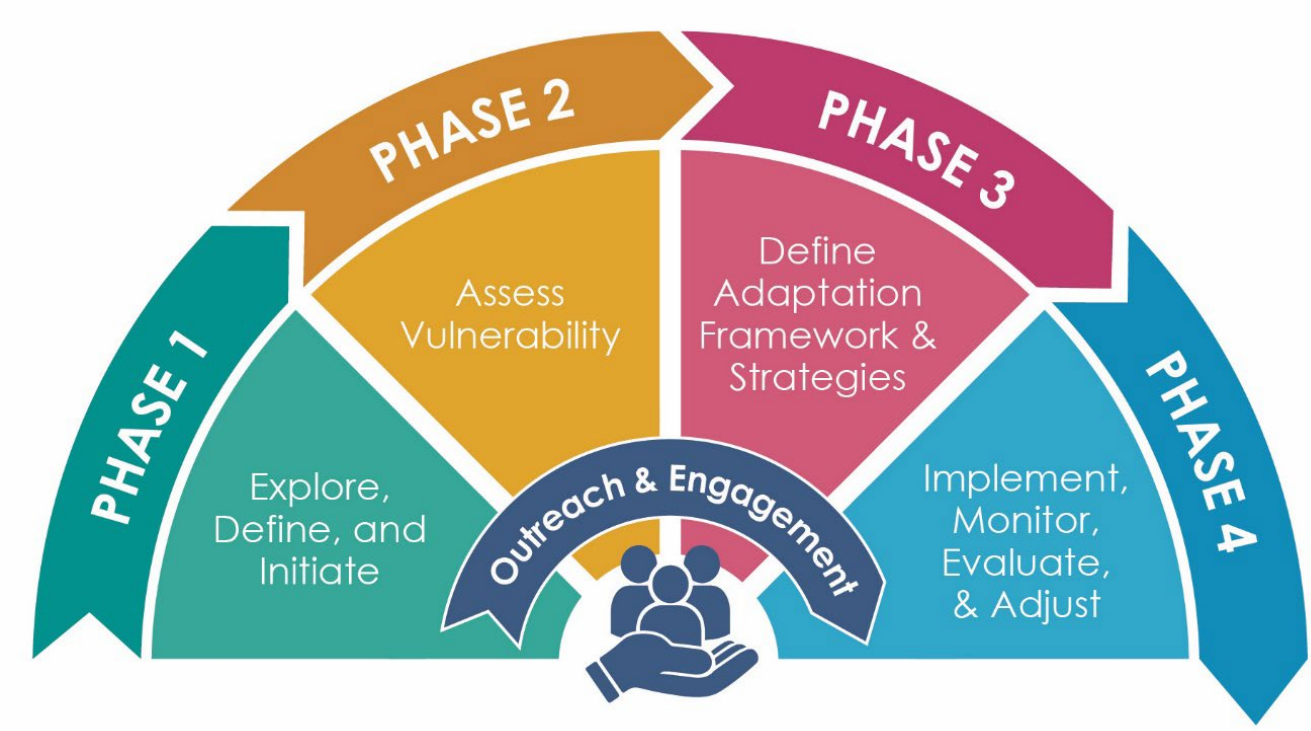
Climate change is a global phenomenon that, over the long term, will cause a wide variety of impacts on human health and safety, economic vitality, water supply, ecosystem function, and the provision of basic services (IPCC 2023). Locally in the San Diego region, as well as throughout California, climate change is already affecting and will continue to affect the physical environment and vulnerable communities. Due to the varying impacts of climate change by location and other social and economic characteristics, it is important to specifically identify the projected severity of these impacts on the City of Encinitas (City) and the surrounding area.

4.1 Climate Change Effects and Vulnerability Assessment

The City has a certified Local Coastal Program (LCP) which is part of the City's adopted General Plan. The Elements contained within the General Plan address specific areas of community concern, including public safety. In 2023, the City adopted an updated Safety Element of the Encinitas General Plan which, as of May 2024, is pending certification from the California Coastal Commission. In accordance with State law, the Safety Element update included a risk assessment related to various natural hazards and potential disasters, including climate change. To address climate change in the Safety Element update, a Climate Vulnerability Assessment and Adaptation Framework was developed and adopted by the Encinitas City Council, in accordance with Senate Bill 379 and the Office of Land Use and Climate Innovation (LCI) General Plan Guidelines (See Appendix B). The Vulnerability Assessment evaluated the Encinitas community's potential future exposure to climate hazards and explored actions the City could employ to reduce its risk to climate change effects, increase the City's capacity to adapt, and build climate resilience. The Vulnerability Assessment expanded upon the City's previous climate planning documents, to provide more detail regarding impacted populations and facilities and lay the groundwork to form policies and programs intended for inclusion in the General Plan Safety Element. Therefore, the Vulnerability Assessment criteria has changed from the last CAP update in 2020, consisting of nine phases of assessment to the current criteria outlined in this CAP update, to be a four phased approach, discussed in greater detail below.

On December 11, 2024, City Council authorized a contract to amend the Resource Management Element of the Encinitas General Plan pursuant to Senate Bill 1425 and Assembly Bill 1889. The Resource Management Element focused amendment will contribute to the resiliency and adaptation strategies of the 2025 Climate Action Plan (2025 CAP), addressing protection and enhancement of natural resources. The update will identify and analyze habitat connectivity areas, rewilding, conserved lands, coastal ecology and conservation areas, within the jurisdiction and existing or planned wildlife passage features, including analyzing the San Diego Multiple Habitat Conservation Plan (MHCP) and the draft Encinitas Sub-Area Plan.

The California Adaptation Planning Guide (APG), developed by California Office of Emergency Services (CalOES) and California Natural Resources Agency (CNRA), helps communities throughout California plan for and adapt to the impacts of climate change (CalOES 2020). In 2020, the APG was updated from a 9-step process to a 4-step process, after the City's 2020 Interim CAP Update was completed. While the number of steps was reduced, the robust nature of the planning process remains intact. To maintain consistency with the latest statewide guidance, the 4-step APG process, illustrated in Figure 4-1, was utilized to develop the City's Climate Vulnerability Assessment as well as this chapter of the 2025 CAP. The APG allows communities to assess their specific climate vulnerabilities and provides strategies for communities to reduce climate-related risks and prepare for current and future impacts of climate change. Recommendations and findings from the Climate Vulnerability Assessment have been incorporated into this chapter of the 2025 CAP.



Source: California Adaptation Planning Guide, 2020.

Figure 4-1: The Four Steps in the Adaptation Planning Process

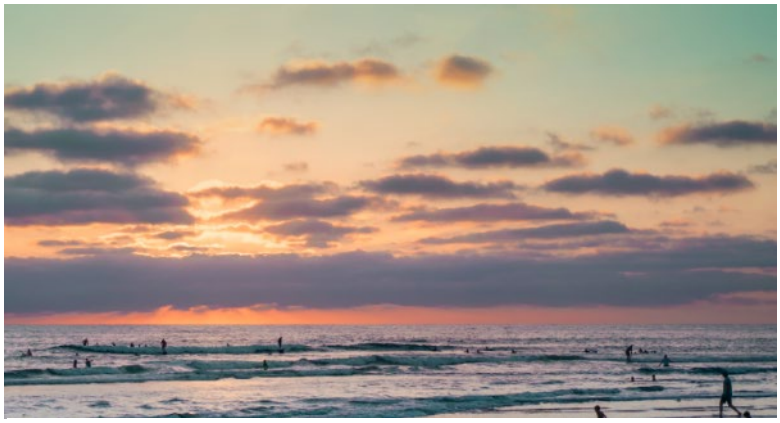
The four steps of the Adaptation Planning Process include:

- **Phase 1, Explore, Define, and Initiate:** This phase includes scoping the process and project, such as identifying the potential climate change effects and important physical, social, and natural assets in the community.
- **Phase 2, Assess Vulnerability:** This phase includes analysis of exposure to, sensitivity of, and adaptive capacity to respond to climate effect to determine physical and social vulnerability.
- **Phase 3, Define Adaptation Framework and Strategies:** This phase focuses on creating an adaptation framework and developing adaptation strategies based on the vulnerability assessment results. The adaptation strategies are the community's potential response to the vulnerability assessment.
- **Phase 4, Implement, Monitor, Evaluate, and Adjust:** In this phase, the adaptation framework is implemented, consistently monitored and evaluated, and adjusted based on continual learning, feedback, and/or triggers.

This section summarizes the climate-related impacts that are anticipated to affect the City and evaluates how these impacts will impact the community's populations, functions, and structures, as identified in the Climate Vulnerability Assessment and Adaptation Framework recently conducted as part of the City's Safety Element Update.

4.1.1 Climate Change Effects

The first step in the climate adaptation planning process is to assess the vulnerability of the City's populations, functions, and structures and the regional impacts of climate change. Using climate scenario planning tools, the assessment focuses on the climate-related impacts most likely to affect the City. To assess the potential direct and indirect effects of climate change in the City of Encinitas, three specialized modeling tools were used: Cal-Adapt, the Coastal Storm Modeling Systems (CoSMoS), and current Fire Hazard Severity Zone Maps.



Sunset at Moonlight Beach

APG, Version 2.0 recommends using Cal-Adapt, because it is a planning tool that effectively downscales global climate change simulation modeling data to local and regional resolution under both high and low global greenhouse gas (GHG) emissions scenarios. Cal-Adapt addresses uncertainty surrounding potential GHG emissions using Representative Concentration Pathways (RCPs). The RCPs in this vulnerability assessment rely upon two future emissions scenarios: RCP 4.5 and RCP 8.5. RCP 4.5 represents a "medium emissions scenario" of GHG emissions and assumes emissions will rise through the middle of the century and decrease to below 1990 levels by the end of the 21st century. RCP 8.5 is a "high emissions scenario" where GHG emissions continue to increase through the end of the 21st century (Bedsworth et al. 2018). Cal-Adapt was developed by the California Energy Commission (CEC) and the University of California, Berkeley Geospatial Innovation Facility.

In addition to Cal-Adapt, the Vulnerability Assessment used data from CoSMoS, a dynamic modeling tool developed by the United States Geological Survey (USGS), used to predict local coastal flooding and identify the City's future coastal vulnerabilities, including erosion and risk of cliff failure. CoSMoS data was used because it includes both future sea level rise predictions and storm intensity, integrated with long-term coastal evolution. CoSMoS models all the relevant physics of a coastal storm (e.g., tides, waves, and storm surge), which are then scaled down to local flood projections for use in community-level coastal planning and decision-making. Rather than relying on historic storm records, CoSMoS uses wind and pressure from global climate models to project coastal storms under changing climatic conditions during the 21st century. Projections of multiple storm scenarios (daily conditions, annual storm, 20-year- and 100-year-return intervals) are provided under a suite of sea-level rise scenarios ranging from 0 to 2 meters (0 to 6.6 feet), along with an extreme 5-meter (16-foot) scenario. This allows users to manage and meet their own planning horizons and specify degrees of risk tolerance (USGS n.d.).

Finally, the California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program maps of Fire Hazard Severity Zones (FHSZ) were used to determine future fire risk due to climate change in Encinitas through the end of the century. The FHSZs are mapped using a graduated scale of moderate, high, and very high fire risk. FHSZ maps are developed from a geospatial model that is designed to describe relative wildland-urban interface (WUI) fire hazard potential over the long-term for all areas of the state. Different steps were taken for modeling FHSZs in wildland areas, defined as those where a fuel model can be applied, and non-wildland areas. Non-wildland includes urban, agricultural and barren lands, and water or wetlands. Wildland areas were scored directly based on data inputs within the wildland, and non-wildland areas were scored using a

buffering routine that builds zones based on proximity to wildland as well as factors that reflect how conducive the non-wildland area is to fire spread. FHSZ maps consider the likelihood that an area will be burned over a 30- to 50-year period and do not consider modifications from fuel reduction efforts.

In the Vulnerability Assessment, climate change effects are categorized as direct or indirect. Direct effects are caused by the initial impacts of increased GHG emissions, while indirect effects occur because of the direct effect(s). Direct climate change effects include changes in temperature and precipitation. Indirect effects, which can occur because of isolated changes or a combination of changes in the direct effects, include extreme heat events, drought, wildfires, coastal and onshore flooding, and landslides. The following sections describe the direct and indirect effects of climate change that are expected to occur in the City of Encinitas in the coming decades.

Changes in Temperature

According to Cal-Adapt, Encinitas's historical (1961-1990) annual average maximum temperature was 74.3 degrees Fahrenheit (°F), and the historic annual minimum temperature was 51.7°F. As shown in Table 4-1, both are projected to increase by mid-century and further increase by the end of the century. As a result of increasing GHG emissions, the annual average maximum temperature in the City is projected to be 77.5°F by mid-century and 78.3°F by the end of the century under the medium emissions scenario. Under the high emissions scenario, the annual average maximum temperature in Encinitas is projected to be 78.6 °F by mid-century and 81.6 °F by the end of the century. This equates to an increase in temperature of 4.3 to 7.3 °F by the end of the 21st century, depending on a medium or high emissions scenario (CEC 2022a).

Table 4-1 Change in Annual Average Temperature (Degrees Fahrenheit)

Average Annual Temperature	Historic Annual Average Temperature (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Maximum	74.3	77.5	78.6	78.3	81.6
Minimum	51.7	54.8	55.8	55.9	59.1

Notes: RCP = Representative Concentration Pathways.

Source: CEC 2022a.

Urban areas are characterized by the predominance of asphalt, paved surfaces, and buildings combined with limited vegetation and green space. During periods of high temperatures, asphalt and darker surfaces absorb and retain heat for longer periods of time. These effects can be exacerbated by activities such as operating vehicles, air conditioning units, as well as industrial activities. This phenomenon raises average temperatures in urban areas and is known as the Urban Heat Island Effect (UHIE). In urban areas, increased average temperatures, as well as more frequent and extreme heat events, can exacerbate the effects of urban heat islands. The UHIE can impact a City in several ways, including increased energy demand for cooling, decreased ambient air quality, and increased heat-related public health risks such as heat stroke, dehydration, and exposure to degraded air quality.

Changes in Precipitation Patterns

According to Cal-Adapt, annual projected precipitation levels in the City are expected to experience modest change by the end of the century. Table 4-2 identifies anticipated annual average precipitation levels for the City of Encinitas. These projections suggest that precipitation levels will be similar to conditions currently experienced within the City during average years.

Table 4-2 Change in Annual Average Precipitation (Inches)

Average Annual Precipitation	Historic Annual Average Precipitation (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Average	11.9	11.3	11.5	11.3	10.9

Notes: RCP = Representative Concentration Pathways

Source: CEC 2022b.

While projections generally show little change in total annual precipitation in California, even modest changes could have a dramatic impact on California's ecosystems, which are conditioned to historic precipitation levels. Changes in weather patterns resulting from increases in global average temperatures could also result in a decreased proportion of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Increased temperatures, particularly in the Sierra Nevada region, which supports the State Water Project, as well as the Rocky Mountains, headwaters of the Colorado River, will lead to earlier and faster snowmelt and could leave the City vulnerable to water resource fluctuation during historically dry months, July through September (DWR n.d.). Additionally, as temperatures rise and snowpack decreases, the dry season may manifest earlier in the year and extend later, leading to a longer season of water supply insecurity.

Increased Frequency of Extreme Heat Events and Heat Waves

Cal-Adapt defines the "extreme heat" day threshold for the City of Encinitas as 94.4 ˚F or higher. The Southern California Climate Adaptation Planning Guide, Fourth Assessment indicates that Southern California can expect longer and hotter heat waves, with continued future warming over the region (Southern California Association of Governments 2020). The annual mean maximum temperature could increase by 7.3°F by 2100 (see Table 4-1). As illustrated in Table 4-3, the annual number of extreme heat days (over 94.4°F) in Encinitas could increase up to 28 days by 2100 (CEC 2022c).

Table 4-3 Change in Number of Extreme Heat Days

Number of Extreme Heat Days[1]	Historic Annual Average Extreme Heat Days (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Annual	4	9	12	12	28

Notes: RCP = Representative Concentration Pathways

[1] Number of days in a year when daily maximum temperature is above a threshold temperature of 94.4 °F.

Source: CEC 2022c.

Heat waves are defined as five or more consecutive extreme heat days. These events have been historically infrequent in the City, with no more than two heat waves occurring in a typical year. Climate change will likely cause a considerable rise in the frequency of extreme heat days in the City under both low and high emissions scenarios. Under the Low-Emissions Scenario, projections show an increase of extreme heat events, with roughly four per year at the middle of the century and up to seven per year in 2099. The high emissions scenario also shows an increase in annual heat wave events, with up to five heat wave events occurring annually by midcentury and as many as 10 heat wave events occurring annually by 2099. Along with an increased frequency of heat events, heat waves are also projected to occur both earlier and later in the season. In the historic record, heat waves have started in August and ended in October; in the future, they are expected to extend from June through October.

Increases in the severity and length of extreme heat events caused by climate change will affect the City's assets and population in several ways. Heat waves and extreme heat events, intensified by the UHIE, produce a number of public health risks, particularly for vulnerable populations including children, the elderly, and those who work outside (e.g. construction workers, agricultural workers). Heat waves and extreme heat events can cause a number of heat-related illnesses including heat cramps, heat exhaustion, and heat stroke, leading to increased hospital visits and emergency services (Sarofim et al. 2016).

Aerial view of New Encinitas

As heat waves worsen, energy systems will need to adapt to help communities and businesses cope with rising temperatures. Access to air conditioning will be vital for vulnerable populations, even lifesaving for the elderly, young children, and those with pre-existing health conditions. However, increased cooling needs for both air conditioning and refrigeration will place significant stress on the power system during periods of extreme heat. If that power comes from fossil-fired power plants, there may also be an increase in soot, smog, and other forms of air pollution with the associated public health consequences (Abel et al. 2018). Impacts on electricity resources from climate hazards can include stress and physical damage to the electricity generation, transmission, and distribution system. Transmission facilities face increasing climate change-related risks because of the increased frequency of wildfires, severe wind, and extreme heat. Extreme heat and drought can add stress to transmission systems, sometimes resulting in system failure. Electrical infrastructure may fail due to increased electrical loads and stress from longer periods of increased operation.

Increased Drought Events

Warmer temperatures also contribute to more frequent and intense droughts by causing a decline in and faster melting of winter snowpack, greater rates of evaporation, and drier soils. These conditions decrease the amount of spring and early summer snowmelt runoff upon which the state historically has depended on for its annual water supply. The dry conditions also increase the demand for irrigation water in both agricultural and urban settings. The period of 2012 through 2015 represents the state's four driest consecutive years on record in terms of statewide precipitation, and 2021 is the third driest single year.

Drought may lead to water-related problems. When rainfall is less than normal for weeks, months, or years, the base flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water-supply problems develop, the dry period can become a drought (USGS 2022).

As a result, droughts have widespread impacts across the state, including risk of low water supply, mandatory water use restrictions, reductions in agricultural crop production, over-pumping of groundwater—which damages infrastructure from land sinking and dries up domestic wells in communities—and degraded habitats for fish and wildlife (State of California, Legislative Analyst's Office 2022).

Increased Wildfire Risk and Smoke

The City's landscape consists of rugged coastal terrain and includes one low-lying coastal ridge. There are several open space areas within the City, characterized by native shrubs and trees. During the dry months, the wildfire risk in these open, vegetated areas can increase when exacerbated by occasional Santa Ana winds. This extreme weather condition is characterized by high temperature, low humidity, and/or winds of extraordinary force, which may cause an ordinary, localized fire to expand into a more intense and difficult to control wildfire. Currently, many homes within Encinitas are located in the WUI, which is characterized by zones of transition between wildland and developed areas and often include heavy fuel loads that increase wildfire risk. (CAL FIRE 2010).

Not only do high-severity wildfires take lives and destroy homes, businesses, and community infrastructure, but they also negatively impact fish and wildlife habitats. Moreover, intense wildfires can also impair air quality throughout the state. In recent years, smoke from wildfires has grown substantially and has been a major contributor to air pollution in the western United States—making up roughly half of small particulate matter, compared to less than 20 percent a decade ago.

Encinitas Fire Department Engine

CAL FIRE's Fire and Resource Assessment Program assesses the condition of California's forests and rangelands and maps fire hazards within State Responsibility Areas based on factors such as vegetative fuels, terrain, and weather. California's seasonally dry Mediterranean Climate lends itself to wildfires, and to better prepare, CAL FIRE is required to classify the severity of fire hazards in areas of California. CAL FIRE has developed maps which categorize lands into moderate, high, and very high FHSZ. FHSZ maps consider the likelihood that an area will be burned over a 30- to 50-year period and do not consider modifications from fuel reduction effort (California Office of the State Fire Marshall n.d.). As shown in Figure 4-2: Fire Hazard Severity Zones Map, 6.7 square miles, or approximately 35 percent, of the City is within a Very High FHSZ.

Additionally, wildfire can cause direct and indirect damage to electrical infrastructure. Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity. Furthermore, because of historical forest management trends over the past century, increased temperatures, and more frequent drought, California wildfires are characteristically hotter and more intense as compared to naturally occurring fire regimes. As such, soil structure and moisture retention are damaged leading to increased susceptibility to erosion or landslides.

Increased Likelihood of Flooding

Climate change is predicted to modify the frequency, intensity, and duration of extreme storm events, such as sustained periods of heavy precipitation and increased rainfall intensity during precipitation events (IPCC 2022). Climate models predict that California will experience less frequent but more intense storm patterns in the coming decades, including the state's precipitation more frequently falling as rain rather than snow, compared to historical trends. Additionally, the state's streams and rivers will swell more in some years from earlier and faster spring snowmelt caused by higher temperatures. Scientists suggest the combination of these factors could lead to a 50 percent increase in runoff in future years, challenging the capacity of the state's existing reservoirs, canals, levees, and other flood control systems and increasing the risk of inland flooding. Floods cause significant risk to human life and damage roads, buildings, and other infrastructure (State of California, Legislative Analyst's Office 2022).

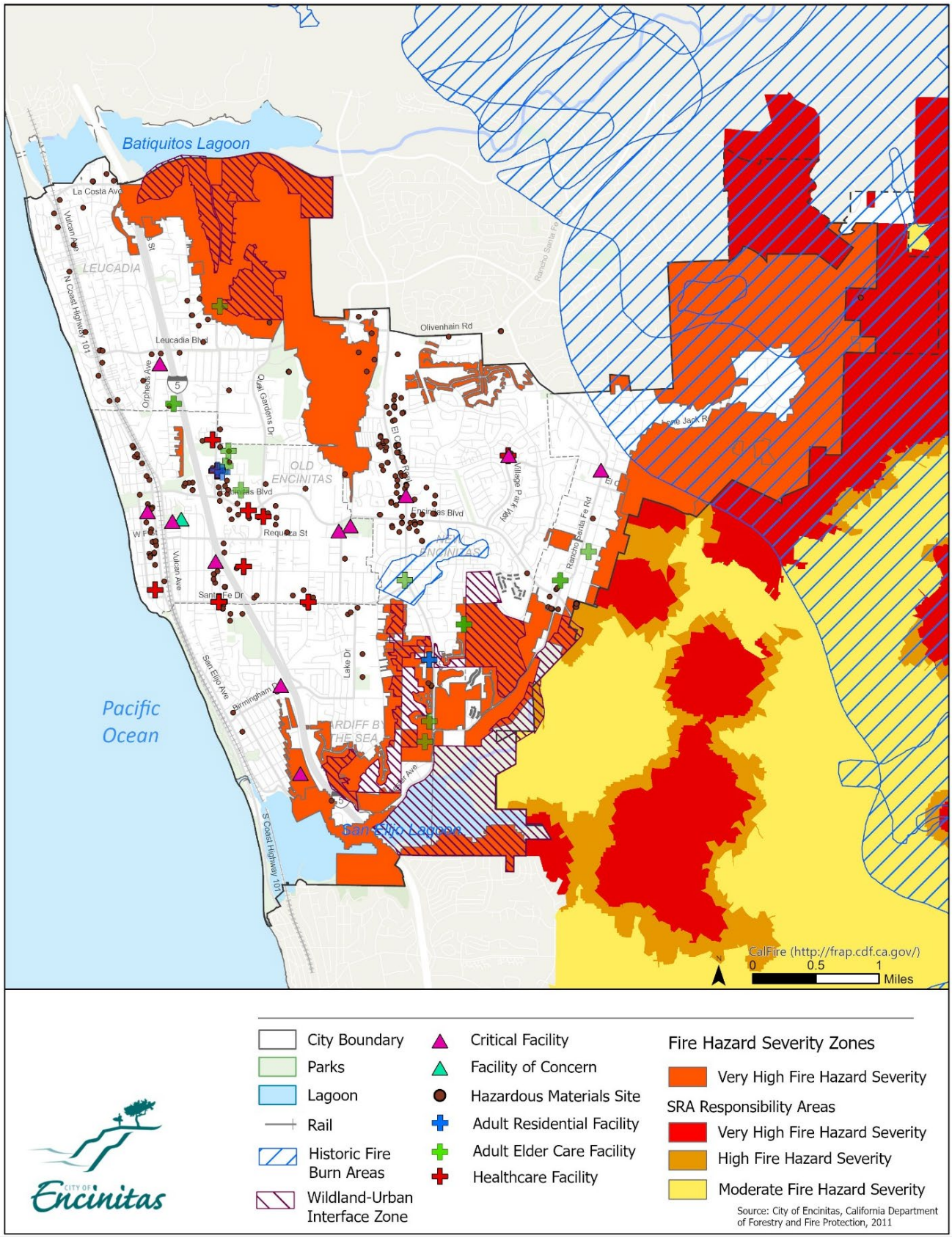


Figure 4-2: Fire Hazard Severity Zones Map

Flooding in Leucadia

Currently, the City experiences localized flooding in several areas during heavy rainfall and extreme weather events. Historically, the City has experienced property-related losses and damage because of localized flooding in Leucadia, particularly along Coast Highway 101 and Vulcan Ave, and coastal flooding in portions of Cardiff at San Elijo State Beach Campgrounds and "Restaurant Row." Specifically, winter storms in 2024 resulted in the declaration of a Major Disaster by the Federal Emergency Management Administration (FEMA) and the distribution of $20 million in disaster recovery assistance throughout the San Diego region (FEMA 2024). During this storm event all flood prone areas of the City were inundated with substantial volumes of water. The City's Public Works crews worked around the clock to attenuate flooded areas using deployed pumps and mobile vacuum trucks.

Areas of Encinitas already experiencing flooding during heavy rainfall events could find that flooding increases in the future. However, the forecasted changes in Maximum 1-Day Precipitation are not anticipated to be substantially different from historical records (see Table 4-4. Change in Maximum 1-Day Precipitation) (CEC 2022d). Therefore, impacts from flooding caused by projected climate change should not be dramatically different than what the community currently experiences.

Table 4-4 Change in Maximum 1-Day Precipitation (Inches)

Maximum 1-Day Precipitation	Historic Maximum 1-Day Precipitation (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Maximum	1.168	1.169	1.189	1.208	1.248

Notes: RCP = Representative Concentration Pathway.

Source: CEC 2022d.

The City's flooding potential will also be exacerbated when experiencing atmospheric rivers, or narrow streams of warm, concentrated precipitation often resulting in the deposition of considerable rainfall over a short period of time. Under higher emissions scenarios wherein temperatures are expected to increase more when compared to lower emissions scenarios, the intensity and magnitude of atmospheric rivers are expected to become more severe, resulting in increased regional and localized flooding (Payne et al. 2020).

During flooding events, infrastructure (e.g., roadways, power lines) may be damaged, in turn disrupting communications, energy transmission, public services, and transportation systems. Floodwaters during storm events can interact with sources of pollution and distribute hazardous pollutants locally and regionally. The resulting water contamination, especially along the adjacent coastline, may lead to human health impacts as well as degradation of ecosystems. Flood events can also cause considerable property damage through flooding damage, as well as structural damage, through erosion and increased risk of mudslides.

Sea-Level Rise and Bluff Erosion

With six miles of coastline critical to the local economy, tourism industry, and regional recreation, coastal hazards are a primary climate-related concern for Encinitas. Coastal hazards include coastal flooding and erosion, both of which are expected to be exacerbated by climate change. According to the closest tide gauge in La Jolla, CA, sea levels rose 0.67 feet between 1924 and 2021 (NOAA 2022). The frequency of extreme coastal floods is expected to increase under all projections of sea-level rise. Rising seas boost the occurrence of severe floods (such as the 500-year flood) more than moderate floods (such as the 10-year flood) along the Pacific coast of the United States (Buchanan 2017). By elevating storm tide, the water level due to the combination of storm surge and the astronomical tide, sea-level rise makes it easier for waves to overtop natural barriers, increasing the relative frequency of flooding along the Pacific coast.

A significant impact of global climate change is sea-level rise. The average global sea level rose approximately 7 inches during the last century. According to Ocean Protection Council's (OPC) *State of California Sea-Level Rise Guidance: 2018 Update*, there is a 66 percent probability that Encinitas could experience up to 0.6 feet of sea-level rise by 2030, 1.2 feet by 2050, and 3.6 feet by 2100 under the high emissions, RCP 8.5, scenario (OPC 2018).

South view of Cardiff State Beach during winter King Tides

The OPC projections were translated to the closest data available from CoSMoS. Based on this data, the following sea-level rise projections were used to estimate the exposure from daily average flooding and storm surge (100-year) flooding: 0.8 feet, or 0.25 meters, of sea-level rise (2030 timeframe), 1.6 feet, or 0.5 meters, (2050 timeframe), and 6.6 feet, or 2.0 meters, of sea-level rise (2100 timeframe). Daily flooding was used to estimate exposure to chronic inundation and represents the extent of flooding that would occur at high tide on average each day, assuming each sea-level rise scenario (Figure 4-3: Chronic Inundation). Storm surge (100-year storm) flooding was used to estimate exposure to more severe but periodic flooding and represents the extent of flooding that would occur during a 100-year (one percent annual chance) storm, assuming each sea-level rise scenario in Figure 4-4: Storm Surge Flooding. The storm surge flooding scenario is not additive to the daily flooding scenario.

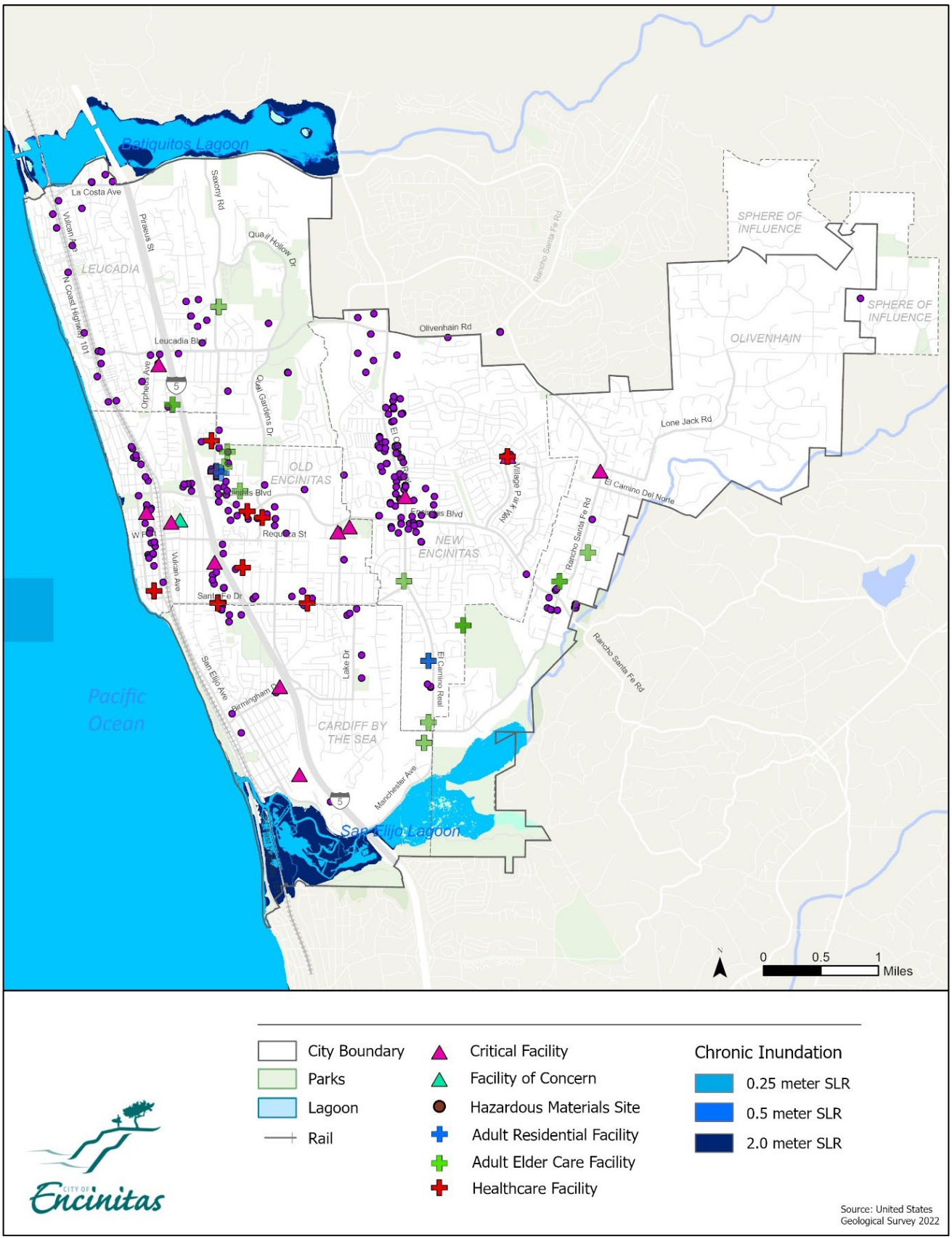


Figure 4-3: Chronic Inundation Map

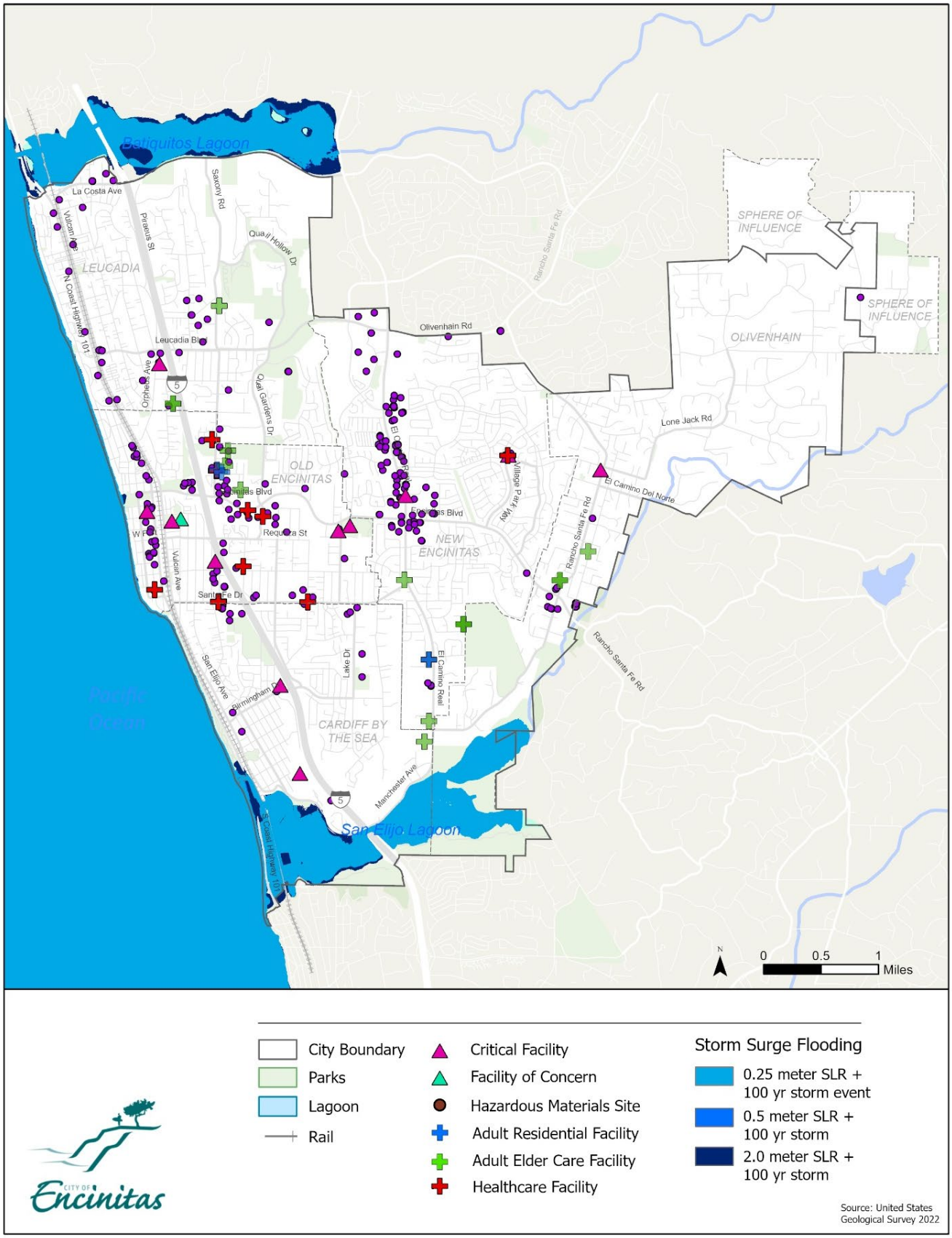


Figure 4-4: Storm Surge Flooding Map

King tides in Encinitas already result in flooding along low-lying stretches of shoreline. Storm surge and sea-level rise modeling considers how current conditions will change with sea-level rise in the future and evaluates tidal floodingin terms of total water level above today's mean higher high water (MHHW) level. MHHW level is the average level of the highest tide for each day computed over a multi-day period. Using total water level recognizes the contribution of both sea-level rise and storm surge to flooding and reflects a range of scenarios.

Additionally, the City has experienced considerable coastal erosion from El Niño storms from the early 1980's to present time, which eroded sand from local beaches by up to 20 feet in depth and more than a 100 feet in width, structurally compromising bluffs and damaging coastal homes in the City. Segments of the shoreline along Moonlight State Beach and Cardiff State Beach are at great risk of coastal inundation from storm wave run-up and hightide surge with future sea-level rise. Destabilized coastal bluffs throughout Encinitas have the potential to fail, including bluff collapse, landslide, and sluffing. Public health and safety are the top priority for the City and reducing the possibility of bluff failure is of the highest importance. Signage has been placed at all beach access points and along the bluffs. Lifeguards, City staff, and law enforcement routinely educate beach goers to stay back from the bluff face to avoid injury or death.

North view of Grandview Beach

The soft sandstone bluffs common along the Encinitas coastline are prone to erosion from waves and stormwater runoff. In addition, sea-level rise together with increased storm frequency may accelerate beach and other shoreline erosion. As the beaches narrow, sensitive sandstone bluffs are exposed to crashing waves, which carve notches into the bluffs at its based or "toe." Bluffs affected by these notches are then prone to episodic collapse. Consequently, residential properties on the upper bluff are experiencing land loss, requiring property owners to spend significant resources in efforts to protect their property and structures. In 2012, an Army Corps survey of toe notches on the Encinitas coastline showed 190 parcels had toe notches of 8-11 feet deep. The other 188 parcels had toe notches of six feet or less (USACE 2012).

Increased Likelihood of Landslide and Liquefaction

In the context of climate change vulnerability, increased liquefaction and the heightened possibility of landslide events are a concern. Both hazards are related to increased precipitation and flooding because soils must be saturated with water for liquefaction or landslides to occur. Liquefaction occurs when seismic energy shakes an area with low-density, fine grain soil, like sand or silt, which is also saturated with water. When the shaking motion occurs in these areas, it can cause loosely packed soils to suddenly compact, making the waterlogged sediment behave more like a liquid than solid ground. Landslides occur when the earth on a slope becomes destabilized, typically after heavy rains, when the precipitation saturates the soil and makes it less stable, or when significant erosion from rainfall destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides, as the fires burn and eliminate the trees, brush, and other vegetation that help stabilize the earth.

Coastal Erosion along the Encinitas shoreline

As climate change is anticipated to change the usual precipitation patterns in Southern California, including Encinitas, periods of both rain and drought are anticipated to become more intense and frequent. Therefore, depending on the circumstances, climate change could increase the future risk of liquefaction in Encinitas. Given the topography, it is anticipated that landslide risk will remain high in some areas. However, the City requires mitigation of these types of conditions, which reduces landslide potential in the developed areas of the City.

4.2 Current Adaptation Efforts

The City is addressing many of the challenges associated with climate change impacts through existing local policies, plans, programs, resources, and institutions. One of the most important of these plans is the City of Encinitas Annex to the San Deigo County Multi-Hazard Mitigation Plan (MHMP) (County of San Diego 2023). The MHMP identifies risks from natural and human-caused disasters and outlines strategies to minimize damage and enhance public safety. It serves as a comprehensive resource for decision-making, promoting compliance with state and federal requirements, and fostering inter-jurisdictional coordination.

North County Water Agencies (NCWA) Annual 4th Grade Water Awareness Calendar Contest Submission

As highlighted in the 2023 MHMP, the City has begun to identify existing plans and policies, which can contribute to the City's climate adaptation efforts. As part of the MHMP, the City has adopted several goals, policies, and objectives relevant to climate adaptation. As the City continues to conduct current and future planning efforts, it is critical that climate change and climate-related risks are incorporated into efforts to protect City residents and create a climate resilient community. The following sections discuss how the City is currently working to address each of the climate-related impacts.

4.1.1. Efforts Related to Changes in Temperature and Increased Extreme Heat Events

The 2023 MHMP included several objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal #6 of the 2023 MHMP Chapter on Encinitas intends to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of climate change/severe weather, including heat and drought" (County of San Diego 2023). The goal includes four corresponding objectives and 11 actions to help the City prepare for the impacts of extreme heat events. Objectives and actions focus on reducing urban heat islands, protecting vulnerable populations susceptible to extreme heat, and ensuring emergency services are available.

4.1.2. Efforts Related to Changes in Precipitation Patterns

Goal #6 of the MHMP Chapter on Encinitas is intended to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to climate change/severe weather, including heat and drought." (County of San Diego 2023). The goal includes four corresponding objectives and 11 actions to help the City prepare for the impacts of drought events. Objectives and actions focus on protecting assets that may be damaged by drought (e.g. trees, landscaping), increasing the use of recycled water for City landscaping, and educating citizens about drought preparedness.

The City relies on a combination of water resources to support the City's water services. The City is served by two water districts. San Dieguito Water District (SDWD) supplies potable water to approximately 38,000 residents generally within the western half of the City and the remaining residents in the eastern half of the City are served by the Olivenhain Municipal Water District (OMWD). The City receives raw water resources from several sources, including Lake Hodges and the San Diego County Water Authority (SDCWA). Both the SDWD and OMWD implement a water conservation program, which administers outreach, education, and incentive programs to help residents and businesses reduce water consumption in their respective districts. The City also uses recycled water from the San Elijo Water Campus to irrigate City-owned facilities, such as the Encinitas Ranch Golf Course and landscaped traffic medians in the City. For each water district, the proportion of water from each source can vary significantly from year to year.

4.1.3. Efforts Related to Increased Wildfire Risk

Goal #3 of the MHMP Chapter on Encinitas is intended to "[r]educe the possibility of damage and losses to people, existing assets, and critical facilities/infrastructure due to wildfires/structural fires" (County of San Diego 2023). The goal includes four corresponding objectives and 11 actions to help the City prepare for the impacts of wildfire events. Objectives and actions focus on improving emergency response efforts related to wildfires, protecting key City assets susceptible to wildfire impacts, and educating residents about wildfire preparedness.

In 2008, the City of Encinitas Fire Department received a FEMA Fire Prevention and Safety Grant to conduct a public education program to educate Encinitas residents on defensible spaces, fire-wise gardening techniques, and how best to protect homeowners from wildfires. The program included a defensible space miniature exhibit house and garden at San Diego Botanic Gardens.

In 2013, the City worked with CAL FIRE, to develop the City's FHSZ map (see map on page 9). The map identifies the very high FHSZ within the City, locating regions in the City at increased risk of wildfire and related hazards.

Encinitas Fire Department employee conducting community education

4.1.4. Efforts Related to Increased Likelihood of Flooding

Goal #4 of the MHMP Chapter on Encinitas aims to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of flooding/dam failure" (County of San Diego 2023). The goal includes three corresponding objectives and eight actions to help the City prepare for the impacts of flooding events. Objectives and actions focus on improving local and regional emergency response efforts related to flooding, protecting key City assets susceptible to flooding impacts, educating residents about flooding preparedness, and improving building and development standards to prevent flood risk.

4.1.5. Efforts Related to Sea Level Rise

Goal #5 of the MHMP is intended to "reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, because of coastal erosion/coastal bluff failure/storm surge/ tsunami/ sea-level rise" (County of San Diego 2023). The objectives and actions included under this goal will serve to better prepare the City for sea-level rise and its consequences, such as coastal erosion, increased storm-wave run-up, beach loss, and slope failure on coastal bluff faces. Objectives and actions under this goal focus on protecting key City assets susceptible to coastal erosion; better plan and prepare for coastal erosion and storm surge events; and educate citizens about the risks of coastal erosion, coastal bluff failure, storm surge, tsunamis, and sea-level rise.

In 2020, the San Diego Regional Climate Collaborative published the *San Diego Region Coastal Resilience Roadmap*. The roadmap fosters multi-jurisdictional resilience through identification of hazard mitigating solutions for regional partners, such as the City of Encinitas, leading to high-impact initiatives and projects. The roadmap contains 76 specific actions and aims to identify opportunities to implement multi-benefit projects that address our region's most urgent coastal resilience needs.

Cardiff State Beach Living Shoreline Project. Completed in 2019, the Cardiff State Beach Living Shoreline Project (Project) restored a historic dune system on top of buried rock revetment to provide multiple benefits, including attenuation of coastal storm damage which can be exacerbated by sea-level rise.

The Project was installed to address frequent flooding and erosion of South Coast Highway 101 due to inadequate protection, as well as the prominence of cobble beaches that reduced suitable habitat and beach use area, and dangerous beach accessways. The aim was to protect South Coast Highway 101 from flood damage while also creating coastal dune habitat and pedestrian access. Sand from future San Elijo Lagoon annual dredging operations and other opportunistic beach sand projects will be used to replenish the coastal side of the dune that is subject to erosion.

The Project was grant funded by the California State Coastal Conservancy, OPC, U.S. Fish and Wildlife Service, and San Diego Association of Governments. It is managed by the City of Encinitas and California State Parks, in partnership with Nature Collective, University of California Los Angeles, and Scripps Institute of Oceanography.

The success of this Project serves as an example for other coastal communities considering such adaptive measures to mitigate impacts due to severe storms and sea level rise.

Cardiff State Beach Living Shoreline Project

U.S. Army Corps of Engineers Coastal Storm Damage Reduction Project. The San Diego County, CA Project (as the project is now referred to) is a Federally approved sand renourishment project that consists of the periodic construction of a protective beach berm along two segments of shoreline in Encinitas and Solana Beach using sand from offshore borrow sites, periodically over the next fifty years. The goal of the project is to buffer local coastal bluffs from continued erosion due to tidal wave action and coastal storm surge. The first cycle of sand renourishment occurred in the winter and spring of 2024 along the project's two segments.

USACE San Diego County, CA Project under construction in Spring 2024 along Encinitas shores

Segment 1 of the project is located in Encinitas and extends from north of Swami's Beach to just south of Beacons Beach, a distance of approximately 1.5 miles. Along this stretch of shoreline, according to approved plans, a 50-foot-wide protective beach berm will be constructed every five years. In 2024, approximately 340,000 cubic yards of compatible sediment was used to renourish the beach in its first cycle. Subsequent cycles plan for a renourishment volume of 220,000 cubic yards of sand.

Segment 2 is located in Solana Beach and extends from Fletcher Cove to just north of the City of Del Mar city limits. Segment 2 has a linear distance of approximately 1.5 miles. In 2024, an initial 150-foot-wide beach berm was constructed using approximately 700,000 cubic yards of compatible sediment. Renourishment of Segment 2 is scheduled to occur every 10 years using 290,000 cubic yards of compatible sediment.

In addition to protecting the coastal bluff from further erosion, the project helps to preserve and protect the beach, City and state property and infrastructure, and public access to the beach. The project supports low- and no-cost public recreational uses and provides environmental benefits by restoring and protecting coastal habitat. See Figure 4-5: San Diego County, CA Project Segment 1 Before and After.

View looking north from Stonesteps Beach before (above) and after (below) completion of the USACE San Diego County, CA Project

Opportunistic Beach Fill Program. Another existing program which supports the City's adaptation to future climate conditions is the Opportunistic Beach Fill Program. This program identifies development or City-sponsored projects that can export sandy beach material to one of the City's four recipient sites, including Moonlight State Beach, Leucadia State Beach (near Beacon's), Batiquitos State Beach and Cardiff State Beach. The City works with developers to conduct monitoring and permitting to ensure that the sediment is both clean and of a granule quality that would be found at the recipient beach sites. The deposited sand from these projects helps further protect the City's coastal bluffs from erosion or failure due to tidal and storm wave action.

Excavator on beach

Sediment being placed within the intertidal area, to be naturally transported by tidal flow.

San Elijo Lagoon Restoration Project. The California Department of Transportation (CALTRANS), District 11, in coordination with the City, Nature Collective, and relevant State and Federal agencies, completed the San Elijo Lagoon Restoration project in 2020. The project consisted of selective dredging and filling of mudflat and salt marsh habitat within the lagoon, intended to improve tidal circulation and restore sensitive habitats currently compromised by surrounding land uses. The project provides continuity of habitats currently threatened by sea-level rise and provides increased adaptive capacity for the surrounding communities during flooding and extreme weather events. Additionally, this project added 300,000 cubic yards of material to the beach and nearshore environment.

San Elijo Lagoon after restoration project completion in 2020

Batiquitos Lagoon Restoration Project. The Batiquitos Lagoon is dredged less frequently than the San Elijo Lagoon. This dredging is typically done every three to five years, depending on California Department of Fish and Wildlife's schedule. This lagoon supplies sediment to the north end of the City and typically provides 100,000 cubic yards or more to South Ponto/Batiquitos State Beach once dredged.

Batiquitos Lagoon dredging operation

4.3 Resiliency and Adaptation Actions

As demonstrated throughout this chapter, climate change will have substantial and profound impacts on the City of Encinitas. This assessment has shown that increased wildfire risk and sea-level rise will likely be the most severe impacts experienced by the City. Several key areas in the City and surrounding areas, such as the San Elijo Lagoon and San Elijo and Cardiff State Beaches, are projected to experience the highest sea-level rise and flooding impacts. Neighborhoods surrounding the City's open space areas, such as Saxony Canyon and the Encinitas Ranch Golf Course, are at increased wildfire risk. Considering the City's coastal geography, sea-level rise and coastal flooding will likely be the most expansive and persistent climate related impact the City will experience over the long term.

Planning for a City that is resilient and adaptive to climate impacts is vital for protecting the health and safety of the public. Adapting to a changing climate requires proactive planning to ensure protection of people, environmental resources, structures and infrastructure. In addition to assessing vulnerabilities, the Climate Vulnerability Assessment and Adaptation Framework, referenced throughout this chapter, defined the specific actions the City should take to prepare for the future effects of a changing climate. Chapter 4: Climate Adaptation Framework of the Climate Vulnerability Assessment contained in Appendix B, classified these adaptation "Actions" into the following seven categories:

1. General Climate Hazard Adaptation
2. Extreme Heat Events
3. Drought and Water Supply
4. Wildfire and Smoke
5. Flooding – Onshore
6. Coastal Flooding and Bluff Erosion
7. Liquefaction

Each category includes programs and policies to support climate resiliency and adaptation, focusing on specific vulnerabilities and impacts that have the potential to impact the community's populations, functions, and structures. Each category is broken down into various actions, including "Interagency Coordination", "Education and Outreach", "Planning and Engineering", "Water Conservation", "Planning Tools", "Location-specific Sea Level Rise Adaptation Strategies", and "Building and Environmental Design". These specific actions are further outlined to build adaptive capacity and increase resilience to climate change-related impacts in Encinitas. The proposed actions also have the potential to provide other important benefits to the community, or co-benefits.

The set of actions presented in the Vulnerability Assessment, contained in Chapter 4: Climate Adaptation Framework, should not be considered in any preferential order, as unique actions are appropriate for various locations and for differing vulnerabilities and resource protection goals. Additionally, approaches can change over time depending on resources available, as well as community goals and needs. In many instances, a hybrid approach to adaptation that utilizes strategies across multiple categories is necessary to reduce overall climate vulnerability.

Therefore, the Climate Adaptation Framework of the Vulnerability Assessment recommends the City take an "Adaptive Pathways" approach. Adaptive Pathways is a planning framework that considers the uncertainty of climate change and the change in risk conditions and allows for flexibility in implementation to improve effectiveness and economic efficiency. An adaptive pathways approach identifies thresholds or points in time when decisions or action pathways should be revisited, allowing for adjustments in implementation to be made based on changing conditions.

To view the assessment's findings and recommendations for resiliency and adaptation actions, please see Appendix B, City of Encinitas Climate Vulnerability Assessment (Chapter 3) and Climate Adaptation Framework (Chapter 4).

CITY OF Encinitas

CHAPTER 5

Implementation and Monitoring

This chapter outlines how the City of Encinitas (City) will implement and monitor the 2025 Climate Action Plan (2025 CAP) strategies, measures, primary implementation actions, and supporting actions over time to reduce greenhouse gases (GHGs). To achieve the GHG emissions reductions described in Chapter 3, actions should also be continuously assessed and monitored to ensure that: 1) the actions are effective; 2) the 2025 CAP is on track to achieve GHG reduction targets; and 3) desired community outcomes are met.

A separate and detailed Implementation Cost Analysis (ICA) was prepared in conjunction with the final draft of the 2025 CAP. This ICA was conducted by the Energy Policy Initiatives Center (EPIC) at the University of San Diego and is included as Appendix G. The ICA estimates costs and level of effort for the City in the first five fiscal years after the CAP adoption to implement the activities needed to achieve the GHG emissions reduction targets. The Final CAP, CEQA document, and ICA will be presented to the City Council concurrently. The more detailed ICA identifies key costs to the City including expenditure type and funding status. It also includes a timeline for the implementation of each GHG reduction measure and action. All primary implementation actions and supporting actions requiring significant funding will be brought to City Council for consideration and approval, either through the City's standard budget process or as an off-cycle budget request. This chapter of the CAP provides a brief overview of the range of implementation needs and considerations for the 2025 CAP.

5.1. Implementation Strategy

The recommended primary implementation actions and supporting actions were evaluated qualitatively to assess the cost, timeline, administrative and staffing needs, and responsible parties required for implementation. The City will incur costs to implement the primary implementation actions and supporting actions proposed in the 2025 CAP. These include operating, personnel, and capital and work project costs. While some actions and measures will only require funding from public entities, others may result in increased costs for businesses, contractors, and residents, which was not part of the ICA. However, most actions and measures provide substantial cost-savings in the long-term (e.g., improved energy efficiency will reduce energy costs over time). The City will be diligent in seeking cost-effective implementation and strategic funding opportunities while using partnerships to share the cost. Details on implementation costs can be found in the ICA provided in Appendix G, which includes the following details for each measure:

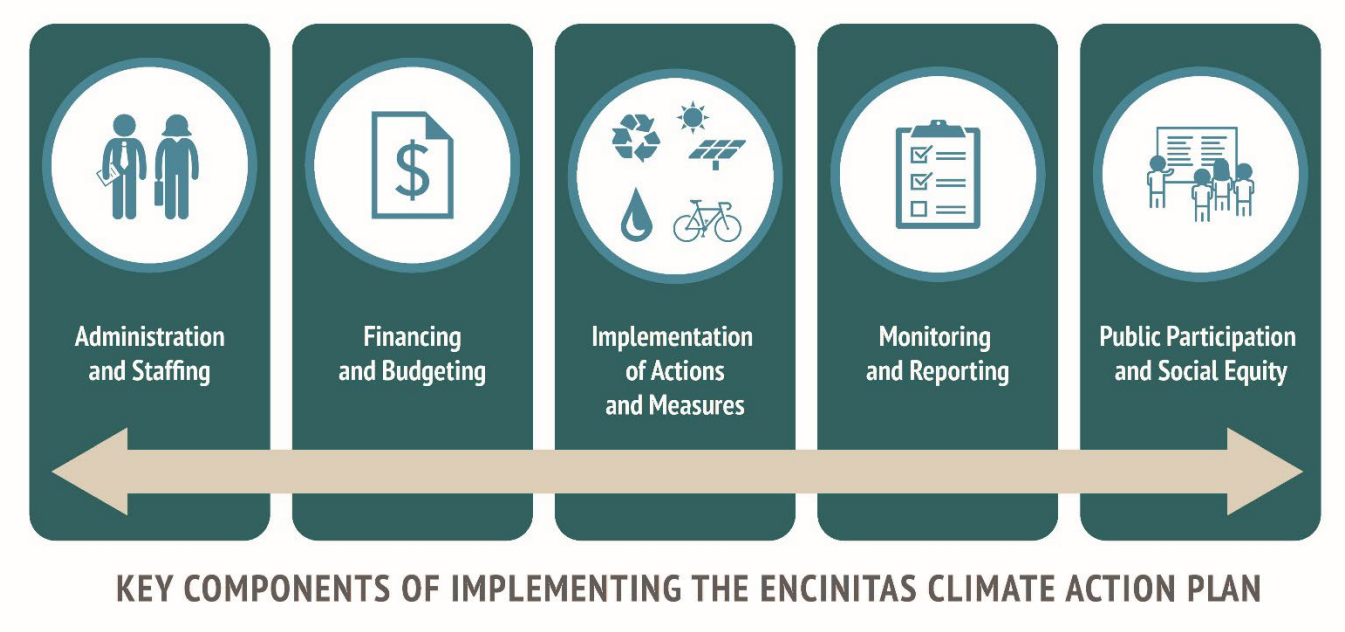
- Relevant parties and responsible departments for implementation,
- Implementation timeline for fiscal year 2025-2026 through 2029-2030,
- Expenditure types (capital, personnel, and operating), and
- Funding status.

An overview of the CAP measures and the lead and supporting City divisions responsible for implementation can be found in Appendix H 2025 CAP Implementation Matrix.

5.1.1. CAP Administration

The Sustainability Division, within the City's Development Services Department, is responsible for implementation, administration, and monitoring of the CAP. The Sustainability Division is tasked with leading the overall implementation of the CAP and plays a key role in implementing some of the most critical primary implementation actions and many supporting actions. The Sustainability Division will also be responsible for monitoring and reporting progress towards meeting the 2025 CAP goals and emissions targets. Implementation of the 2025 CAP will be facilitated by appointed staff leads within various departments (see Appendix H). These staff leads also comprise the staff level CAP

Workgroup. The Sustainability Manager will manage the CAP Workgroup, convening and managing regular meetings to facilitate coordination of CAP implementation among the various City departments. The Sustainability Manager receives support for implementation of CAP measures and actions, particularly in the Building Decarbonization Strategy, from the Sustainability Management Analyst. To administer public participation and annual reporting, the Sustainability Division contracts a CivicSpark Fellow from the CivicSpark AmeriCorps program fiscally sponsored by the Public Health Institute. Furthermore, the City receives support from a College Corps Fellow for public participation via partnership with the University of San Diego. The Coastal Zone Program Administrator, also within the Sustainability Division, ensures effective coastal zone management and implementation of sea-level rise adaptation actions. The Coastal Zone Program Administrator receives support from the Coastal Aide to administer monitoring and reporting for the coastal zone management area.



KEY COMPONENTS OF IMPLEMENTING THE ENCINITAS CLIMATE ACTION PLAN

5.1.2. Social Equity

Incorporating equity into the implementation of the CAP will be key to successful deployment of climate action. Equity would ensure the just distribution of the benefits of climate action and would help alleviate unequal impacts created by climate change. Social equity is a broad subject that transcends the CAP and intersects with multiple facets of City operations. However, the CAP presents an opportunity to begin addressing climate equity and laying the foundation for further action by the City.

The City currently manages various programs to address equity in planning. The City contracted with Opportunity Consultant in 2023 to conduct an assessment titled *Barriers to Racial and Ethnic Equity in Housing within Encinitas*. The City incorporated recommendations into planning initiatives including the climate action planning process. As such, the City will incorporate equity considerations into the implementation of the CAP, which were identified for applicable CAP measures as provided in Chapter 3. The City will keep the equity considerations front and center as it plans for implementation of CAP measures and actions. Moreover, the City will also consider low-income areas when locating and installing electric vehicle (EV) charging stations. The needs of underserved communities, such as low-income and seniors, should also be considered when siting local transit shuttle routes and stops. Active transportation-related actions would be implemented to provide benefits to low-income populations, students, children, and other groups that do not have access to other transportation choices.

Green Jobs Creation

Implementation of the 2025 CAP will continue to foster green jobs in the local community and around the region. The CAP measures include a variety of policies that will require specialized labor, including but not limited to the expansion of renewable energy resources, energy efficiency services, roadway improvements, vegetation maintenance, and waste management. Policies created to advance the deployment of renewable energy generation at residential, and commercial buildings in Encinitas directly support the creation of green jobs. Every year in Encinitas, hundreds of solar PV systems are installed at homes and businesses, either voluntarily or as a result of Encinitas green building regulations. Of the solar installed, a majority of installers are locally based companies. According to California Public Utilities Commission data, of the 1,195 solar PV systems installed in Encinitas in 2023, 751 were installed by companies based in San Diego County. Solar PV systems installed by San Diego County-based companies directly support the local green economy and create green jobs.

Furthermore, the City has been a member of Cleantech San Diego for close to ten years. Cleantech San Diego is a nonprofit business association that works to advance and support the greater San Diego region's clean energy sector by fostering collaboration across the private-public-academic landscape, leading advocacy efforts to promote cleantech priorities, supporting energy entrepreneurs, and encouraging more equitable investment in cleantech. Supporting Cleantech San Diego's work helps drive innovation that could accelerate CAP implementation and fosters a local green job market. The City will continue to support Cleantech San Diego during 2025 CAP implementation.

5.1.3. California Environmental Quality Act and Demonstrating Consistency

With associated California Environmental Quality Act (CEQA) coverage, the 2025 CAP qualifies under Section 15183.5 of the CEQA Guidelines as a plan for the reduction of GHG emissions for use in cumulative impact analysis pertaining to development projects. Subsequent development actions considered to be a "project" subject to the environmental review process under CEQA may be streamlined using a CAP consistency review checklist, which is the Climate Action Plan Checklist for the City. CEQA guidelines require that a project perform an analysis of GHG emissions and potential climate change impacts from new development. The Climate Action Plan Checklist provides an overview of the CAP measures that apply to certain zoning and building code areas and is used to review projects' consistency with the CAP.

Demonstrating consistency with the Climate Action Plan Checklist establishes that a project will not result in an "additional environmental effect" in the City's initial study checklist. Projects that do not demonstrate consistency may, at the City's discretion, prepare a more comprehensive project-specific analysis of GHG emissions consistent with CEQA requirements. Moreover, the Climate Action Plan Checklist will be updated when zoning and building codes are being updated through implementation of the 2025 CAP. While zoning and building code updates included in the 2025 CAP are in process or not yet completed, projects will need to be reviewed against the 2025 CAP in addition to the Climate Action Plan Checklist.

5.2. Monitoring and Updates

The 2025 CAP presents a broad-based strategy to reduce GHG emissions and improve the sustainability and resilience of the community. However, the 2025 CAP will need to be updated and maintained if it is to remain relevant and effective. Thus, City staff will need to evaluate and monitor plan performance over time and make recommendations to alter or amend the plan if it is not achieving the proposed reduction targets. This will include periodic GHG emissions inventories and analyzing the performance of CAP measures.

The 2025 CAP is a dynamic document that will be continuously assessed and monitored. Regular monitoring and performance measuring of activities will allow the City to make timely adjustments to existing measures and actions; replace ineffective or obsolete measures and actions; or add new measures and actions as technology, federal and State programs, and circumstances change. Adjustments will be made to the 2025 CAP if measures and actions fall short of the targets or additional measures and actions become available. As new data and resources, future federal and State legislation and regulations, improvements in energy and efficiency technology, new regional plans, updates to building standards, or new GHG emission calculation standards become available, the City may amend the 2025 CAP to provide additional flexibility or clarity. The City recognizes that flexibility in implementation is necessary to allow the City to evolve its strategies to achieve the most effective CAP.

5.2.1. CAP Progress and Monitoring Reporting

City staff will begin to implement the measures and actions in this 2025 CAP once adopted. Because the 2025 CAP builds on the City's past climate planning efforts, implementation and monitoring of the CAP will begin immediately after its adoption. A monitoring report that summarizes the ongoing monitoring will be presented to the Environmental Commission and City Council annually, which will include the status of measure and action implementation using monitoring metrics and the progress in meeting the reduction targets.

Pursuant to Step 7 of the City's 2011 CAP Implementation Plan, in 2017, the City developed and implemented a systematic reporting process to inform decision makers and the public about CAP implementation progress through an online "dashboard." The Climate Dashboard provides an annual report of measurements, monitoring, and management of key CAP activities. The Climate Dashboard serves as a live, interactive performance monitoring tool and can assist staff and policy makers in making objective decisions regarding CAP implementation. The Climate Dashboard can be viewed here: www.EncinitasEnvironment.org.

5.2.2. Greenhouse Gas Emissions Inventory Updates

While based on extensive research and analysis, the City's GHG inventory represents a snapshot in time. As technologies and markets change, and the City implements the measures and actions in the 2025 CAP, new inventories will be prepared to track progress. As a result, GHG inventories will be conducted on a regular basis using current data and assumptions. The City will continue to complete GHG inventories on a two-year schedule. Regular GHG inventories provide information about emissions reductions over time, in comparison to the 2016 baseline inventory and 2030 and 2045 emission projections.

5.2.3. CAP Updates

Based on the findings from the monitoring reports and inventory updates, the City will continue to prepare CAP updates every five years, with the next update expected to be completed in 2030. Future CAP updates will be guided by direction from the City Council and guidance from the Environmental Commission. The CAP updates will include updated baseline inventories, adjustments to reduction measures and actions, as necessary, and any changes to land use projections to achieve consistency with zoning and the General Plan land use designations and policies.

CAP Implementation and Monitoring Schedule

2025 **CAP Adopted**
Council adopts CAP and staff begins to implement actions and supporting measures.

2025 **Continue Implementation and Monitoring**
The CAP Update builds on previous efforts; therefore implementation and monitoring will continue immediately after adoption.

2026 **GHG Emissions Inventory Update**
Staff conducts an update to the emissions inventory every two years.

2026 **Annual CAP Monitoring Report**
Staff prepares and presents the first annual monitoring report to the City Council and Environmental Commission assessing the 2025 CAP's annual performance in achieving targeted goals.

2030 **CAP Update**
Based on findings from the annual monitoring reports and inventory updates, staff prepares a CAP update every five years.

5.3. Ongoing Engagement

As the City continues to implement and monitor progress on the 2025 CAP, continued engagement with and participation by the community is critical. This includes individual residents and businesses, community organizations, schools, developers, property owners, other local and regional government agencies, and others. While the 2025 CAP focuses on actions and measures in which the City has a role, many of the actions and measures require partnerships and collaboration.

The City is also committed to public education about the important role individuals play in combatting climate change and its effects. Education and outreach are especially key for the younger generation, as they will be exposed to the worsening impacts of climate change in future decades. The City Council has a School District Liaison Committee (SDLC) which facilitates collaboration with local school districts. Ongoing engagement for the CAP will include coordination and educational outreach to local schools and school children through the SDLC and other avenues. Effective and long-term climate action and resiliency in the city can only be achieved through efforts that continue to change the way individuals interact with the environment. Many of the actions and measures in Chapter 3, as well as the strategies outlined in Chapter 4, are focused on increasing community awareness and participation in existing programs or connecting the community with new information, tools, funding, or resources to act. Thus, the 2025 CAP serves as a resource that supports community-based action. To meet the City and State's GHG reduction goals, individual participation will be key. Further, the City's Climate Dashboard will provide a publicly available, up-to-date inventory for City residents and stakeholders facilitating engagement in ongoing CAP-related activities.

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CITY OF Encinitas

CHAPTER 6

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Appendix A

Comparison of 2020 and 2025 CAP Measures

Encinitas CAP Comparison		
Status	**Measure #**	**Measure Description**
Strategy 1: Building Decarbonization		
Updated Existing (BE-1)	BD-1	Require Existing Residential Development Energy Efficiency
Updated Existing (BE-2)	BD-2	Require New Residential Development Decarbonization
Updated Existing (BE-3)	BD-3	Require Existing Nonresidential Development Energy Efficiency
Updated Existing (BE-4)	BD-4	Require New Nonresidential Development Decarbonization
New	BD-5	Decarbonize Existing Buildings
Updated Existing (MBE-1)	MBD-1	Implement Energy Efficiency and Decarbonization Projects at Existing Municipal Facilities
New	MBD-2	Require New Municipal Facilities be All-Electric
Strategy 2: Renewable Energy		
Updated Existing (RE-1)	RE-1	Maintain Membership in San Diego Community Power
Updated Existing (RE-3)	RE-2	Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems
Updated Existing (MRE-1)	MRE-1	Install Microgrids with On-site Solar and Battery Storage at Existing Municipal Facilities
New	MRE-2	Require New Municipal Facilities to Install Microgrids with On-Site Solar and Battery Storage
Strategy 3: Water Efficiency		
Updated Existing (WE-1)	WE-1	Support Local Water Districts' Water Conservation Efforts
New	WE-2	Require New Single Family Homes to be Pre-Plumbed for Greywater Systems
New	MWE-1	Convert City-Owned Landscape to Drought Tolerant or Native Species
Strategy 4: Clean and Efficient Transportation		
Updated Existing (CET-1)	CET-1	Implement the Active Transportation Plan
Updated Existing (CET-2)	CET-2	Implement a Flexible Fleet Program
New	CET-3	Require Transportation Demand Management Programs for New Nonresidential and Major Redevelopment Projects
New	CET-4	Reduce Vehicle Miles Traveled
Updated Existing (formerly CET-3)	CET-5	Improve Traffic Flow
Updated Existing (formerly CET-4)	CET-6	Require Existing Residential Buildings to be Electric Vehicle Ready
Updated Existing (formerly CET-5)	CET-7	Require Nonresidential Electric Vehicle Charging Stations
Updated Existing (MCET-1)	MCET-1	Transition to Zero Emission Vehicle Municipal Fleet
Updated Existing (MCET-2)	MCET-2	Implement a Municipal Employee Transportation Demand Management Program
New	MCET-3	Install Public Electric Vehicle Charging Stations
Strategy 5: Reduce Off Road Equipment		
Updated Existing (OR-1)	ZE-1	Limit Use of Gas-Powered Leaf Blowers
New	ZE-2	Limit Use of Gas-Powered Landscape Equipment
Strategy 6: Zero Waste		
Updated Existing (ZW-1)	ZW-1	Implement a Zero Waste Program
Strategy 7: Carbon Sequestration		
New	CS-1	Establish a Tree Canopy Goal for the City
New	CS-2	Enforce Landscape Tree Requirements at New Developments
New	CS-3	Incentivize Tree Planting on Private Property
New	CS-4	Adopt and Implement a Mature Tree Ordinance
Updated Existing (MCS-1)	MCS-1	Plant and Maintain City Trees

Appendix B

City of Encinitas Climate Vulnerability Assessment and Adaptation Framework

CITY OF ENCINITAS
CLIMATE VULNERABILITY ASSESSMENT & ADAPTATION FRAMEWORK

November 17, 2022

Updates made include information up to January 26, 2023

ORGANIZATION

This document includes the following chapters:

Chapter 1- Introduction

This chapter describes climate adaptation planning and the applicable State requirements as they relate to this Vulnerability Assessment and Adaptation Framework.

Chapter 2 – Community Profile

This chapter provides a description of the City's general environment and demographics. Special emphasis is made to reveal disadvantaged communities and vulnerable populations.

Chapter 3 – Vulnerability Assessment

This chapter includes forecasts of each of the five climate-related hazards. It also maps where those hazards are most likely to affect Encinitas and which areas are most vulnerable to these changes.

This chapter evaluates the City's current capacity to address the five climate-related hazards. This includes an assessment of the City's current policies and programs and how they address the ability to respond to hazard events.

Chapter 4 – Adaptation Framework: Recommendations to Improve Resilience

This chapter includes potential actions and policy recommendations to increase the City's ability to adapt to hazards and meet the needs of its vulnerable communities.

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CHAPTER 1. INTRODUCTION

According to the State of California's Legislative Analyst's Office:

> *"Addressing the widespread impacts of climate change represents a significant challenge for the state. A changing climate presents California with five key climate hazards: (1) higher temperatures and extreme heat events, (2) more severe wildfires, (3) more frequent and intense droughts, (4) flooding due to extreme precipitation events, and (5) coastal flooding and erosion from sea-level rise. These hazards will threaten public health, safety, and well-being—including from life-threatening events, damage to public and private property and infrastructure, and impaired natural resources."*[1]

To address the potential impacts of these hazardous events on the community, the City of Encinitas is expanding upon its climate action and hazard mitigation planning efforts to focus on climate change adaptation by understanding the community's vulnerabilities to climate hazards and exploring strategies to reduce the vulnerability to projected climate change effects, increase the local capacity to adapt, and build resilience.

This vulnerability assessment and adaptation framework follow goals outlined in the City of Encinitas' Safety Element and San Diego County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) that correspond with climate adaptation planning, specifically:

Safety Element Goal 2:

"The City of Encinitas will make an effort to minimize potential hazards to public health, safety, and welfare and to prevent the loss of life and damage to health and property resulting from both natural and man-made phenomena."

Multi-Jurisdictional Hazard Mitigation Plan (Section 5: Encinitas)

"Reduce the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to":

Goal 4. Geologic Hazards, including Earthquake, Liquefaction, and Landslides

Goal 5. Structural Fires/Wildfires

Goal 6. Flooding/Dam Failure

Goal 7. Coastal Erosion and Bluff Failure/Storm Surge/Tsunami/Sea Level Rise

Goal 8. Severe Weather, including Extreme Heat

Goal 9. Drought[2]

Encinitas Climate Action Plan

The City's existing climate change adaptation efforts are laid out in the City of Encinitas' Climate Action Plan (CAP), updated on November 18, 2020. Chapter 5, Adaptation, follows the State of California's Adaptation

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[1] State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. https://lao.ca.gov/Publications/Report/4575. Accessed April 11, 2022.
[2] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

Planning Guide's (APG) process focused on preparing a Vulnerability Assessment, which is a method for determining the anticipated impacts of climate change on community assets and populations. The first phase evaluates a community's level of exposure to climate-related impacts and analyzes how these impacts will affect a community's population, functions, and structures. The second phase of the process used the information gathered in the Vulnerability Assessment to develop adaptation strategies and measures to help the community prepare for, respond to, and adapt to local climate change impacts. The CAP's Adaptation chapter serves as an abbreviated version of a full Vulnerability Assessment, identifies key climate-related risks faced by the City, and provides key strategies to increase the City's climate resilience and adaptive capacity.[3] Relevant strategies from the CAP are included within.

This effort aims to expand upon the City's previous work to provide more detail regarding impacted populations and facilities and lays the groundwork to form policies and programs intended for inclusion in the General Plan Safety Element.

Regulatory Drivers and Guidance for Climate Adaptation Planning

The report includes a Vulnerability Assessment and Adaptation Framework, which will be incorporated into the City's General Plan Safety Element, in compliance with SB 379, Government Code section 65302(g)(4)[4] and the Office of Planning & Research's (OPR) General Plan Guidelines.

According to SB 379, general plan safety elements must address climate change vulnerability, adaptation strategies, and emergency response strategies. SB 379 states:

> *"This bill would, upon the next revision of a local hazard mitigation plan on or after January 1, 2017, or, if the local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, require the safety element to be reviewed and updated as necessary to address climate adaptation and resiliency strategies applicable to that city or county. The bill would require the update to include a set of goals, policies, and objectives based on a vulnerability assessment, identifying the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, and specified information from federal, state, regional, and local agencies."*

As specified in Government Code section 65302(g)(4)(A), vulnerability assessments must identify the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, utilizing federal, state, regional, and local climate vulnerability documentation such as APG 2.0 and the Cal-Adapt climate tool created by the California Energy Commission (CEC) and University of California, Berkeley Geospatial Innovation Facility. Other sources of information include data from local agencies regarding their adaptive capacity and historical data on natural events and hazards. Per Government Code section 65302(g)(4)(B), adaptation policies, goals, and objectives are to be developed based on findings from the vulnerability assessment. Additionally, Government Code section 65302(g)(4)(C) requires jurisdictions to create a set of feasible implementation measures to reduce climate change impacts on new or proposed land uses.

SB 1000, THE PLANNING FOR HEALTHY COMMUNITIES ACT

Codified in 2016, low-income residents, communities of color, tribal nations, and immigrant communities have disproportionately experienced the greatest environmental burdens and related health problems. This Vulnerability Assessment addresses environmental justice in compliance with SB 1000 as it relates to

[3] City of Encinitas Climate Action Plan. November 18, 2020.
[4] SB 379 was enacted to integrate climate change adaptation into California's general plan process.

climate adaptation. Of the six topics required by SB1000, this Vulnerability Assessment addresses air pollution exposure in vulnerable communities, as air pollution is one of the climate-related hazards.

Consistent with Government Code 65302(g)(4)(A), the following vulnerability assessment and adaptation framework also take guidance from:

CALIFORNIA'S FOURTH CLIMATE ASSESSMENT (2018)

California Natural Resources Agency (CNRA), OPR, and CEC prepared California's Fourth Climate Assessment (Climate Assessment) in 2018. The Climate Assessment was designed to present findings in the context of existing climate science, including strategies to adapt to climate impacts and key research gaps needed to spur additional progress on safeguarding California from climate change.

SAFEGUARDING CALIFORNIA PLAN (2018)

CNRA released an update to the Safeguarding California Plan in 2018, providing a roadmap for State government action to build climate resiliency. The Safeguarding California Plan presents overarching strategies and outlines ongoing actions and cost-effective and achievable next steps to make California more resilient to climate change.

OCEAN PROTECTION COUNCIL STATE SEA LEVEL RISE GUIDANCE (2018)

Between 2017 and 2018, the Ocean Protection Council (OPC) released two reports that updated their understanding of sea-level rise science and best practices for planning and addressing anticipated impacts. The reports synthesize recent evolving research on sea-level rise science and provide higher-level recommendations for planning for and addressing sea-level rise impacts, notably including a set of projections recommended for use in planning, permitting, investment, and other decisions.

CALIFORNIA COASTAL COMMISSION SEA LEVEL RISE POLICY GUIDANCE (2018)

The California Coastal Commission (CCC) adopted the Sea Level Rise Policy Guidance in 2015 and provided a science update in 2018, using information from OPC's State SLR Guidance. The document 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.

CALIFORNIA ADAPTATION PLANNING GUIDE (2020)

The California Office of Emergency Services (CalOES) released the second version of the Adaptation Planning Guide in 2020 - APG 2.0 - which includes updated guidance, an increased focus on equity and outreach, and best practices. The APG is designed to help local government, regional entities, and climate organizations incorporate best practices and current science and research into their adaptation plans.

LOCAL AND REGIONAL CLIMATE PLANNING

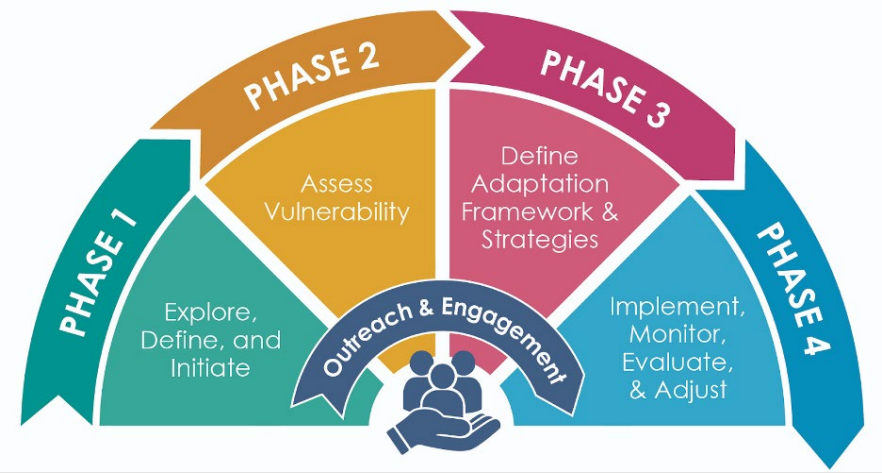
This vulnerability assessment and adaptation framework also draws upon existing efforts in the region to address climate change. These documents include, but are not limited to:

- City of Encinitas General Plan Safety Element (Amended 1995)
- City of Encinitas Climate Action Plan (2020)
- City of Encinitas chapter of San Diego County's Multi-Jurisdictional Hazard Mitigation Plan (2017)
- California Department of Transportation (Caltrans) Climate Change Vulnerability Assessment District 11 Technical Report (2019)
- San Diego Association of Governments (SANDAG) San Diego Forward: The Regional Plan (2021)

- San Diego County Water Authority's (SDCWA) Water Shortage Contingency Plan (2020)
- San Diego Regional Climate Collaborative (SDRCC) and SANDAG Regional Adaptation Needs Assessment (2020)

Methodology and Planning Process

The APG provides a four-step process that communities can use to plan for climate change.[5] The APG is designed to be flexible and guide communities in adaptation planning.



Source: California Governor's Office of Emergency Services, 2020.

Phases of the Adaptation Planning Process

Phase 1, Explore, Define, and Initiate: This phase includes scoping the process and project, such as identifying the potential climate change effects and important physical, social, and natural assets in the community.

Phase 2, Assess Vulnerability: This phase includes analysis of exposure to, sensitivity of, and adaptive capacity to respond to climate effect to determine physical and social vulnerability.

Phase 3, Define Adaptation Framework and Strategies: This phase focuses on creating an adaptation framework and developing adaptation strategies based on the vulnerability assessment results. The adaptation strategies are the community's potential response to the vulnerability assessment.

Phase 4, Implement, Monitor, Evaluate, and Adjust: In this phase, the adaptation framework is implemented, consistently monitored and evaluated, and adjusted based on continual learning, feedback, and/or triggers.

The purpose of this report is to document Step 1 through Step 3. The vulnerability assessment and development of adaptation measures follow the approach recommended by APG 2.0.

The vulnerability assessment identifies projected climate change exposures for the City at mid- to late-century timeframes. In addition to identifying the City's exposure to the effects of climate change, the vulnerability assessment evaluates the sensitivity of key population groups and sectors to climate change and associated hazards.

[5] California Adaptation Planning Guide. June 2020.

CHAPTER 2. COMMUNITY PROFILE

Located along six miles of Pacific coastline in northern San Diego County, the City of Encinitas offers a unique blend of old-world charm, sophistication, and new-world culture. Incorporated in 1986, the City brought together the communities of New Encinitas, Old Encinitas, Cardiff-by-the-Sea, Olivenhain, and Leucadia to create a single City rich in history and steeped in tradition. With its pristine beaches and rolling hills, famous Botanic Garden, and vibrant downtown business district, the City of Encinitas attracts visitors from all over the world.[6]

According to the US Census American Community Survey (ACS), in 2020 the City of Encinitas had a population of 62,007. **Table 2-1: Demographics** displays the demographics in Encinitas and San Diego County using ACS data from 2019. The median income for Encinitas residents is 50 percent greater than that for the region. Consistent with this finding, a larger percentage of residents own their homes, and fewer live below the poverty level. The number of households with a person living with a disability is 19.1 percent for Encinitas and 21.4 percent for San Diego County.

Table 2-1: Demographics

	Encinitas	San Diego
Total Population	62,007	3,323,970
Percent of residents that are children (less than 10 years)	11.0%	12.0%
Percent of households that have people 65+ years	34.1%	27.7%
Percentage of households with at least one person living with a disability	19.1%[1]	21.4%
Median age	43	36.1
Total households	23,893	1,125,277
Median household income	$120,488	$84,988
Percent of rental households	36.2%	45.6%
Percent of household income below the poverty level	7.2%	10.5%
Note: Percentage values rounded to nearest tenth decimal.		

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

Compared to the region, Encinitas skews older, with 33.3 percent of the population aged 55 and older compared to 25 percent for San Diego County (See **Table 2-2: Age Distribution Comparison**). San Diego County's age distribution showed a younger population, with the largest population below 35 years of age (49.6 percent) compared to Encinitas (39.5 percent).

Table 2-2: Age Distribution

	Encinitas	San Diego County
Under 5	5.6%	6.2%
5 - 14	11.7%	12.0%
15 - 24	9.5%	13.7%
25 - 34	11.5%	16.5%
35 - 44	14.0%	13.4%
45 - 54	14.4%	12.3%
55 - 64	14.7%	11.8%
Over 65	18.6%	14.1%
Note: Percentage values rounded to nearest tenth decimal.		

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

[6] https://encinitasca.gov/Visitors/About-Encinitas

In California, those persons of retirement age (i.e., 65 years and older) are expected to grow more than twice as fast as the total population, and this growth will vary by region. This means that people are living longer, and the number of older persons is increasing. This trend is also evident in Encinitas, where the percentage of the population aged 65 – 74 years doubled from 2010 to 2020.

The racial and ethnic composition of a population may affect housing needs because of cultural preferences associated with different racial/ethnic groups. Cultural influences may reflect a preference for a specific type of housing. Research has shown that particular cultures (e.g., Hispanic and Asian) tend to maintain extended families within a single household.

Table 2-3: Race and Ethnicity shows that, according to the 2020 American Community Survey, the ethnic distribution of the Encinitas population was predominantly White, not Hispanic or Latino (76.4 percent), with about four percent reporting as Asian. Approximately 16 percent of the Encinitas population was of Hispanic origin. San Diego County exhibited more ethnic diversity, with 44.9 percent of the population being White, not Hispanic or Latino, 12 percent Asian, and 34 percent of Hispanic or Latino origin. The race/ethnic composition of City residents has remained stable in Encinitas compared to the 2010 Census, with the proportion of Asian residents remaining stable and the proportion of Hispanic residents increasing from 13.7 to 15.9 percent. Countywide, from 2000 to 2010, the population of Hispanic or Latino origin increased from 27 percent to 33.9 percent.[7]

Table 2-3: Race and Ethnicity	Encinitas	San Diego County
White Alone (Not Hispanic or Latino)	76.4%	44.9%
Black Alone (Not Hispanic or Latino)	0.3%	4.9%
American Indian Alone (Not Hispanic or	0.1%	0.7%
Asian Alone (Not Hispanic or Latino)	3.7%	12.0%
Pacific Islander Alone (Not Hispanic or	0.1%	0.4%
Some Other Race Alone (Not Hispanic or	0.1%	0.2%
Two or More Races (Not Hispanic or	3.4%	8.6%
Hispanic Origin (Any Race)	15.9%	33.9%
Note: Percentage values rounded to nearest tenth decimal.		

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

Vulnerable Communities

Table 2-4: English Proficiency and Languages Spoken at Home Among	Number of Speakers	Percent Not Fluent in English[1]
English Only	49,181	-
Spanish	6,820	13.8%
Indo-European Languages	2,201	4.0%
Asian and Pacific Island Languages	925	14.2%
Other Languages	287	2.5%
Note: Percentage values rounded to nearest tenth decimal.		

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

The City is facing challenges in meeting its housing needs. Encinitas's housing costs continue to climb, while the availability and variety of housing are lacking. According to HomeDex, a real estate data source for North San Diego County, in November 2019, the median sales price in Encinitas was 55 percent higher than

[7] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029.

the median sales price for the North County region. At the same time, the City has a growing population, and its existing residents have changing needs.

- Baby Boomers are aging, and the City's senior citizen population (over 60 years of age) is projected to nearly double by 2035. Many seniors will seek to downsize and move into smaller homes in areas with easy access to services, transportation, and amenities.
- Millennials have been slower to buy single-family homes than earlier generations. Rising student debt, the cost of housing, and challenges in securing mortgages have contributed to this, but they often want various kinds of housing and neighborhoods than what is available today. They are looking for pedestrian and bike-friendly communities with services and amenities nearby.
- According to SANDAG's regional growth forecast, Encinitas can expect an anticipated 11 percent population growth through 2050.[8]

2.1 VULNERABLE POPULATIONS

Factors such as age, physical and/or mental condition, socioeconomic status, access to key services, and other factors affect the ability of people to prepare for and protect themselves and their property from a climate-related event. Even though hazard events may impact all parts of the City with equal severity, individuals may experience the effects differently.

Disadvantaged Communities

According to the California Office of Environmental Health Hazard Assessment (OEHHA), a community is considered disadvantaged based on its pollution burden and sensitive populations. OEHHA provides the CalEnviroScreen tool to evaluate and map disadvantaged communities. The dataset helps identify California communities that are most affected by specific sources of pollution and where people are often especially vulnerable to pollution's effects. The dataset uses environmental, health, and socioeconomic information to produce scores for every census tract in the state that is mapped using a scale based on the pollution burden of the location. The higher the percentage, the greater the burden and the higher likelihood of environmental justice concerns.

CalEnviroScreen calculates scores for two groups of indicators: Pollution Burden (e.g., PM2.5 concentrations, diesel PM emissions, adjacency to solid waste sites) and Population Characteristics (e.g., asthma emergency department visits, linguistic isolation, low-income households). **Figure 2-1: CalEnviroScreen 4.0** shows the combined Pollution Burden scores, which are made up of indicators from the Exposures and Environmental Effects components of the CalEnviroScreen model. Pollution Burden represents the potential exposures to pollutants and the adverse environmental conditions caused by pollution. Compared to all census tracts in the state, those tracts in Encinitas are all in the bottom third, meaning Encinitas's population has a lower pollution burden than other areas in the state. As a result, OEHHA does not identify any census tract in the City of Encinitas as containing disadvantaged communities.

While Encinitas may not have state-defined disadvantaged communities, the City still has populations vulnerable to climate hazard events. Each section covering a different climate hazard within the Vulnerability Assessment contains an analysis of social sensitivity using the following criteria to assess the potential impact on vulnerable populations:

- Disability status: Persons with disabilities may often have reduced mobility and experience difficulties living independently. As a result, they may have little or no ability to prepare for and

[8] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029.

mitigate hazard conditions without assistance from others. An estimated 19.1 percent of Encinitas households contain at least one person with a disability. [9]

- Income levels: Lower-income households are less likely to have the financial resources to implement mitigation activities on their residences. They may also struggle with having the necessary time to find and access educational resources discussing hazard mitigation strategies. Furthermore, lower-income households are less likely to be able to afford to move to areas that are safer or less at risk of being impacted by a hazard. The national poverty limit standard for the U.S. for a four-person family is an income of $26,200 or less. In Encinitas, between 2015 and 2019, an estimated 7.1 percent of households had an income that was considered below the poverty level. An estimated 2.3 percent of households received food stamps or qualified for the Supplemental Nutrition Assistance Program (SNAP). [10]
- Seniors (individuals at least 65 years of age): Seniors are more likely to have reduced mobility, physical and/or mental disabilities, and lower income levels, all of which may decrease their ability to prepare for and mitigate a hazard event. Senior Residential Facilities are mapped in **Figure 2-2: Critical Facilities and Hazardous Materials Sites**.

Homeless Population

In January 2022, the annual Point-in-Time Count found thirty-seven sheltered and seventy-six unsheltered individuals in the City of Encinitas (See **Table 2-5: Homeless County – Encinitas (2016-2023)**). The homeless are highly susceptible to impacts from direct and indirect climate effects, including extreme heat events, air pollution from wildfires, and precipitation-driven or coastal flooding.

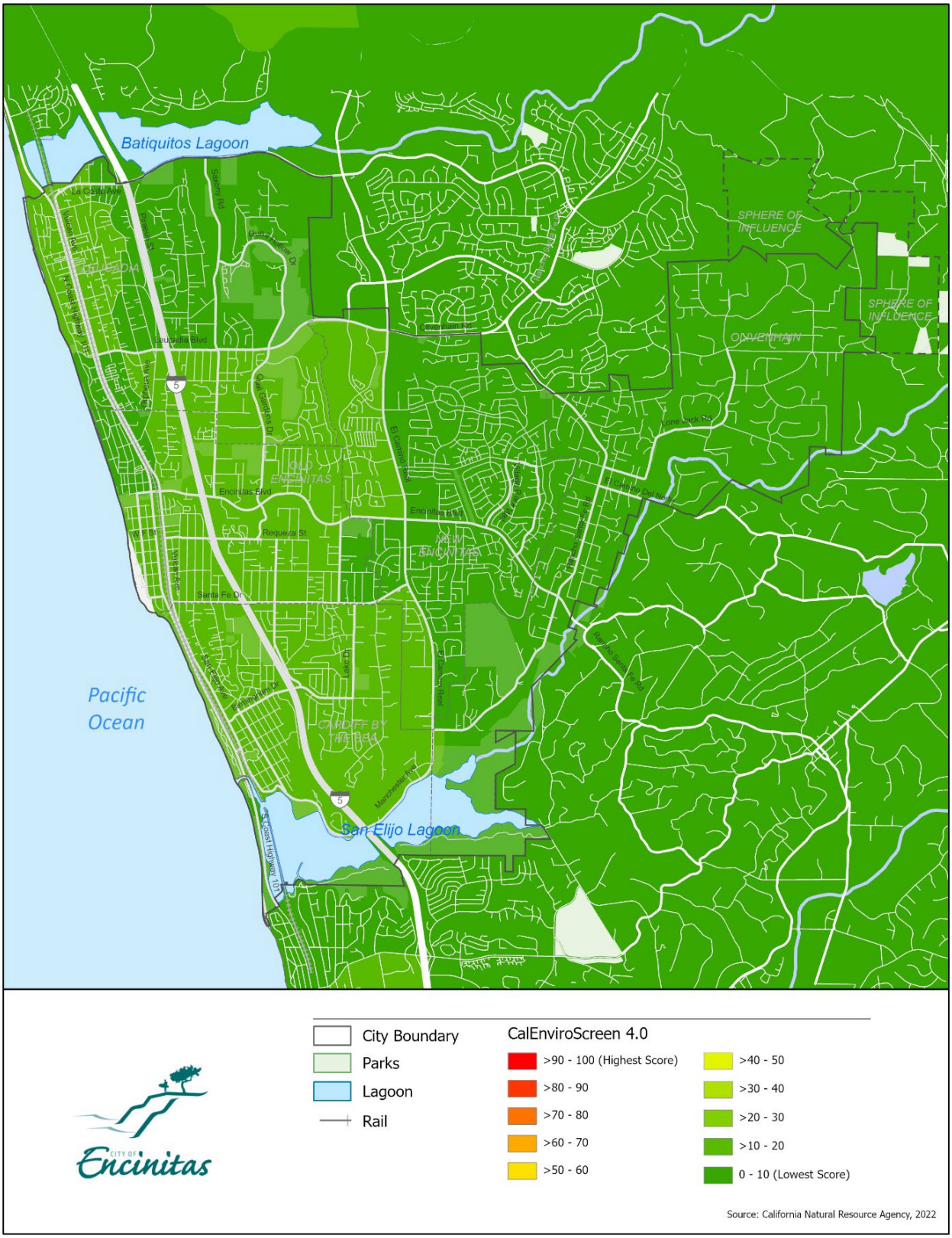
Table 2-5. Homeless Count – Encinitas (2016 – 2023)

Year	Total	Unsheltered	Sheltered
2016	93	54	39
2017	117	84	33
2018	125	86	39
2019*	120	79	41
2020*	80	47	33
2022*	113	76	37
2023*	92	73	19
Note: * Beginning in 2019, San Dieguito, Solana Beach, and Del Mar numbers were included in the Encinitas total.			

Source: San Diego Regional Task Force on Homelessness Point in Time Count

[9] US Census. American Community Survey. 2015-2019. ESRI 2022.
[10] US Census. American Community Survey. 2015-2019. ESRI 2022.

Figure 2-1: CalEnviroScreen 4.0



2.2 MAJOR COMMUNITY ELEMENTS

The City of Encinitas is bounded by the Pacific Ocean on the west. Coastal bluffs at the City's northern boundary overlook the portion of Batiquitos Lagoon that falls within Encinitas and includes lands south and southeast of the lagoon, including Indian Head Canyon, Magdalena Ecke Park, the slopes above Green Valley, and habitat north of Encinitas Boulevard between El Camino Real and Rancho Santa Fe Road. Slopes and bluffs overlook San Elijo Lagoon at the City's southern perimeter. Escondido Creek, a major east-west waterway, traverses the City's southern boundary and empties into the San Elijo Lagoon.

Portions of Encinitas are exposed to a variety of environmental hazards and resources, which may lead them to be more vulnerable to climate change. These constraints include topography, flooding, landslides and seismic hazards, and areas with natural and cultural resources. For example, areas of Olivenhain and the Sphere of Influence area beyond the City's eastern limits include slope areas greater than 25 percent and are characterized by the presence of biological habitat. Residential properties along the coast in Old Encinitas and Leucadia may be affected by the presence of coastal bluffs and erosion.

Residential Uses

With a population of approximately 63,000 residents, the City has a diverse residential base. Many existing homes are in master-planned communities that have been constructed as far back as the 1970s. New construction occurring in the City should meet the latest standards and requirements; however, neighborhoods with older homes may require retrofit improvements to reduce some of the risks to the structures.

Institutional Uses

MiraCosta College, a community college district known for its successful transfer rates, degrees, career planning, and skill-building, enrolls approximately 15,000 students each semester[11], which can increase the City's daytime population, impact roadways, and community services.

Open Space

The City of Encinitas and its residents value the importance of nature and open space. Encinitas boasts abundant opportunities to get outdoors and enjoy a hike or spend quiet time in nature. The Parks, Recreation, and Cultural Arts Department is responsible for eighty-five acres of open space and forty miles of trails. City trails provide pedestrian, bicycle and/or equestrian access to undeveloped open spaces such as Indian Head Canyon and Manchester Preserve. The Olivenhain community enjoys an extensive network of trails relative to other parts of the City. The Encinitas Ranch Specific Plan area has a large trail system as well. The San Elijo Lagoon Ecological Reserve includes approximately five miles of trails managed by the County of San Diego, which serve City residents and visitors. The City's Recreational Trails Master Plan includes plans to develop an additional forty miles of trails and pedestrian connections throughout the City.[12]

[11] MiraCosta College Enrollment. https://www.miracosta.edu/future-students/index.html. Accessed March 31, 2022.
[12] City of Encinitas. 2022. *Trails & Open Space.* https://encinitasca.gov/Trails. Accessed April 6, 2022.

INFRASTRUCTURE ASSESSMENT

Infrastructure plays a vital role in mitigating the effects of hazard events. When infrastructure fails, it can exacerbate the extent of certain hazards or create complications for rescue workers trying to reach victims. For example, because of high winds or seismic activity, fallen utility poles can obstruct roadways and prevent emergency vehicles from reaching affected areas. The following are electrical, fossil fuel, hydrologic, and transportation networks of infrastructure in Encinitas.

Water Supply

The District's water supply portfolio includes imported water purchased from the SDCWA, local surface water from Lake Hodges, and recycled water purchased from the San Elijo Joint Powers Authority (JPA). SDCWA purchases water from the Metropolitan Water District of Southern California (MWD), sourced from both the Colorado River Aqueduct (CRA) and the State Water Project (SWP), treated water from the SDCWA (recycled water source), and local stormwater runoff from the Lake Hodges watershed east of the City. SDCWA also purchases desalinated seawater, which is treated to drinking water standards at the Claude "Bud" Lewis Carlsbad Desalination Plant (Carlsbad Desal Plant).[13]

The San Dieguito Water District (SDWD) serves the City of Encinitas by providing water to approximately 40,000 residents in the communities of Leucadia, Old Encinitas, Cardiff-by-the-Sea, and New Encinitas. The Olivenhain Municipal Water District (OMWD) provides service to the remainder of the City. The OMWD is an independent public agency addressing the water needs of up to 40 percent of Encinitas residents. OMWD primarily serves the City's eastern half, including all or a part of the communities of Olivenhain, New Encinitas, Leucadia, and Cardiff-by-the-Sea.

Stormwater Management

The Stormwater Maintenance Division in the Public Works Department is responsible for maintaining the storm drain infrastructure through comprehensive programmatic efforts. The Stormwater Management Division (Clean Water Program) in the Public Works Department is responsible for enforcing regulatory mandates related to surface water.

The Clean Water Program has two goals: to maintain water quality and protect beaches, lagoons, and creeks from illicit discharges, sewage spills, and other pollutants.

Fire and Emergency Services

The Encinitas Fire and Marine Safety Department serves residents of the coastal, rural, and agricultural communities of Encinitas, Olivenhain, Leucadia, and Cardiff-by-the-Sea. San Diego County's Service Area (CSA) 17 consists of Del Mar, Del Mar Heights, Solana Beach, Encinitas, Rancho Santa Fe, and portions of Elfin Forest. Emergency medical services are provided by the Department and San Diego Medical Services Enterprise (SDMSE) within CSA 17.

There are six strategically located fire stations in the City of Encinitas, allowing firefighters and paramedics to provide timely responses to emergencies and efficiently respond to volume demand.

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[13] San Dieguito Water District. 2020 Urban Water Management Plan, Final. June 2021. https://encinitasca.gov/Portals/0/City%20Documents/Documents/San%20Dieguito%20Water%20District/Engineering/SDWD_2020%20reduced.pdf?ver=2021-06-10-145230-143. Accessed July 12, 2022.

Police Services

The City of Encinitas contracts with the County of San Diego Sheriff's Department to provide police/ law enforcement services to the City. In addition to the City of Encinitas, the North Coastal Station, located in the City off of El Camino Real, provides a wide range of municipal law enforcement services to the cities of Del Mar, Solana Beach, and Rancho Santa Fe. Services include the following:

- Helicopters;
- A bomb/ arson squad;
- A Special Enforcement Detail team;
- Canine units;
- Modern crime lab facilities; and
- One of the nation's most modern law enforcement radio communications networks.

There are no current plans for new facilities.[14]

Wastewater Capacity

The City's Wastewater Maintenance Division in the Public Works Department is responsible for maintaining the existing sewer infrastructure within the City. The City sewer maintenance includes cleaning sewer lines, clearing blockages, repairing breaks, and responding to emergencies. Sewage is conveyed through pipes to either the Encina Wastewater Authority (EWA) in Carlsbad, north of Encinitas, or the San Elijo Water Reclamation Facility in Cardiff, south of Encinitas.

Transportation

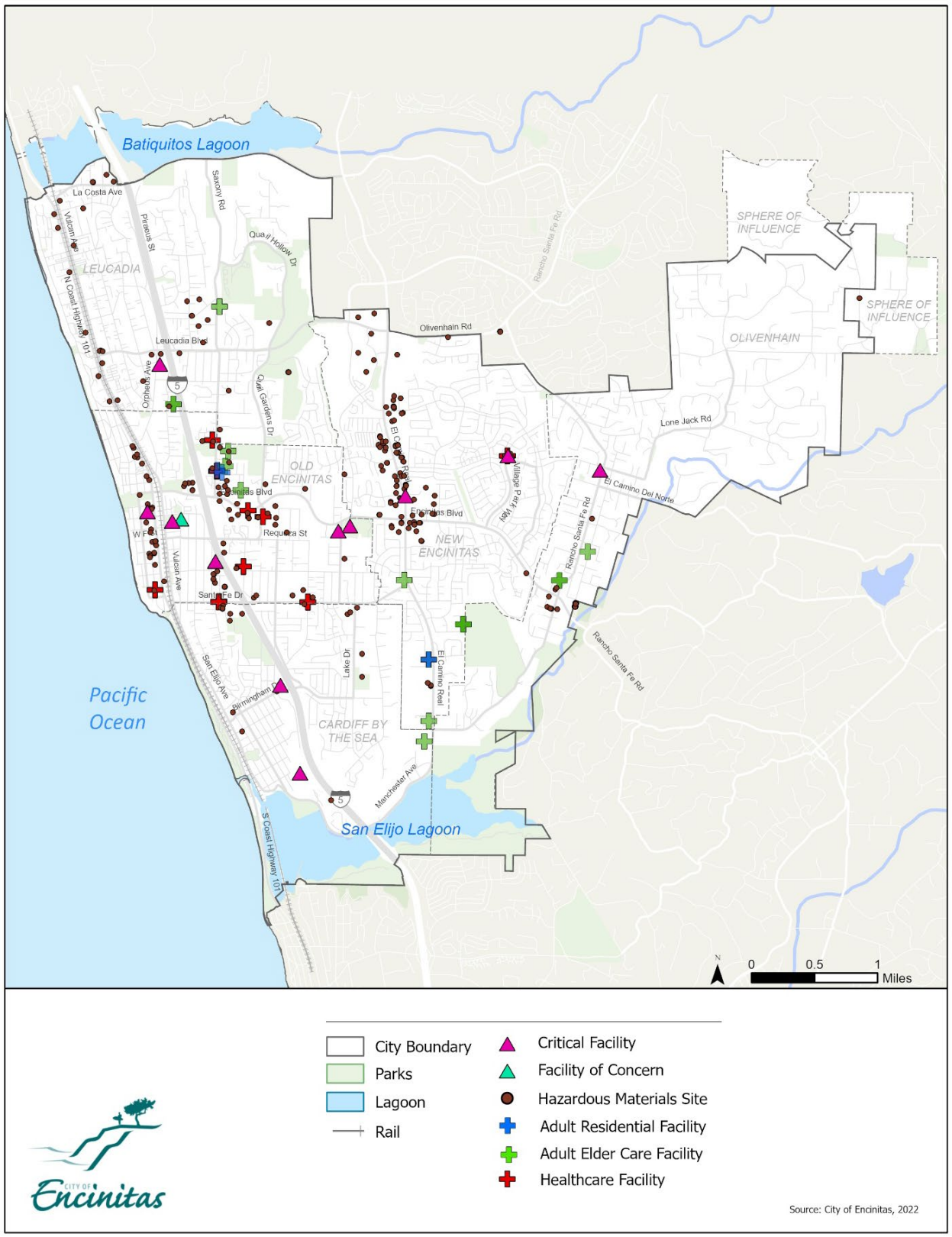
The transportation infrastructure in Encinitas consists of roadways for automobiles, bike facilities for cyclists, and sidewalks, crosswalks and trails for pedestrians. There are also other modes of travel into and out of the City, including freeways, buses/shuttles, regional bike facilities, local commuter trains, and long-distance trains.

Hazardous Waste

Hazardous materials can cause damage to physical assets in Encinitas if they are released into the environment. Corrosive hazardous materials can damage the exteriors of any buildings or structures designated as a critical facility or facility of concern by the City. Flammable hazardous materials can potentially start fires and may cause any nearby critical facilities to flashover. Sites closer to the origin for the release of the hazardous materials are more at threat than those further away. Figure 2-2: Critical Facilities and Hazardous Materials Sites shows Encinitas's critical facilities in relation to hazardous materials sites identified in the City.

[14] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029: Appendix B.

Figure 2-2: Critical Facilities and Hazardous Materials Sites



CHAPTER 3. VULNERABILITY ASSESSMENT

This section provides a comprehensive assessment of the City's vulnerabilities to climate change. It identifies and describes the climate hazards and other climate effects that may affect the City in the future. The Vulnerability Assessment follows the process outlined in Phase 2 of APG 2.0 and is composed of the following three steps:

- Exposure: The purpose of this step is to understand Encinitas' exposure to current and projected climate hazards. Existing hazards that can be worsened by the effects of climate change are identified and described based on historical data, including the City's MJHMP. Climate data are used to develop projections for how existing hazards are expected to change by mid-and late century from future climate change.
- Sensitivity and Potential Impacts: This step will characterize potential future climate impacts on community populations and assets. Using historical data and research from regional and state reports on climate impacts, this step explores how sensitive vulnerable populations and assets may be affected by the projected impacts of climate change hazards.
- Adaptive Capacity: The City and its supporting agencies and countywide organizations have already taken steps to build resilience and protect sensitive populations and assets from hazards. Thus, the purpose of this step is to characterize Encinitas's current capability to cope with the projected impacts from climate hazards to vulnerable populations and assets. The adaptive capacity of the City to adapt to each of the identified climate impacts is determined through a review of existing plans and programs.

3.1 EXISTING HAZARDS

The City of Encinitas has historically been affected by climate or climate-induced hazards such as drought, extreme heat events, wildfires, landslides, and flooding. Examples of significant events include State-wide droughts from 2007-2011, 2012-2016, and 2021 to now. Additionally, the City was impacted by the Harmony Grove wildfire in 1996 that resulted in the loss of three homes and the evacuation and sheltering of hundreds of Encinitas residents. Bluff failures occurring from coastal erosion has resulted in loss of life and property damage. Projected changes in climatic conditions will increase the frequency, duration, and intensity of these events.

3.1.1 ECONOMIC IMPACTS OF CLIMATE CHANGE

Encinitas will be increasingly affected by climate change and has begun to prepare on multiple fronts for climate change related impacts on residents, development, infrastructure, and ecosystems. While the potential costs to Encinitas from climate change hazard impacts are not currently known, economic impact studies for San Diego County provide a glimpse of potential impacts on the City. The following are summaries of regional economic studies relevant to Encinitas:

The cost of the 2007 wildfires in San Diego was estimated at nearly $2 billion for losses in residential and commercial properties. In addition to the direct costs, many private firms and public agencies were forced to shut down during the large-scale wildfire event. A complete three-day shutdown is estimated to cost $1.5 billion. Therefore, a large-scale wildfire due to climate change can have a major impact on the economy due to productivity losses.[15]

[15] California Climate Change Center. n.d. *Climate Change Related Impacts in the San Diego Region by 2050.*

According to the San Diego Foundation's Economic Resilience: Health and Water studies, the potential productivity and financial losses from climate change hazards include:

- Sixty-five thousand production hours lost in heat-exposed industries.
- Seventeen percent increase in commercial sector spending on electricity due to increased A/C usage.
- As much as $9.4 million in additional employee medical costs annually due to extreme heat.[16]
- Forty-six percent expected increase in San Diego County's water demand by 2035 due to increasing population, rising temperatures, less frequent rain, and increased soil and water reservoir evaporation.
- $10-18 million estimated costs to commercial, residential, and government sectors per significant flooding event.[17]

One study estimated that approximately $400 million of commercial and industrial property could be lost annually in San Diego County with 6.5 feet of sea-level rise.[18]

3.2 ANALYZING CLIMATE CHANGE

Climate change effects are categorized as direct or indirect. Direct effects are caused by the initial impacts of increased GHG emissions, while indirect effects occur because of the direct effect(s). The direct climate change effects include changes in temperature and precipitation. The indirect effects, which can occur because of isolated changes or a combination of changes in the direct effects (e.g., temperature or temperature plus precipitation), include extreme heat events, drought, wildfires, onshore flooding associated with large precipitation events, landslides, and coastal flooding and inundation resulting from sea-level rise.

To assess the potential direct and indirect effects of climate change, APG 2.0 recommends using Cal-Adapt, a global climate simulation model data. Cal-Adapt addresses uncertainty surrounding potential greenhouse gas (GHG) emissions using Representative Concentration Pathways. The RCPs in this vulnerability assessment rely upon two future emissions scenarios: RCP 4.5 and RCP 8.5. RCP 4.5 represents a medium emissions scenario of GHG emissions and assumes emissions will rise, even out near the middle of the century, and decrease to below 1990 levels by the end of the 21st century. RCP 8.5 is a high emissions scenario where GHG emissions continue to increase through the end of the 21st century.[19]

Cal-Adapt also includes ten global climate models, downscaled to local and regional resolution using the Localized Constructed Analogs statistical technique. California's Climate Action Team Research Working Group selected four of these models as priority models for research contributing to California's Fourth Climate Change Assessment. The projected future climate from these four models can be described as producing:

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[16] San Diego Foundation. n.d. *Economic Resilience: Health*. https://www.sdfoundation.org/wp-content/uploads/2016/04/economic-resilience-health.pdf. Accessed April 20, 2022.

[17] San Diego Foundation. n.d. *Economic Resilience: Water.* https://www.sdfoundation.org/wp-content/uploads/2016/04/economic-resilience-water.pdf. Accessed April 20, 2022.

[18] Kalansky, Julie, Dan Cayan, Kate Barba, Laura Walsh, Kimberly Brouwer, Dani Boudreau. (University of California, San Diego). 2018. *San Diego Summary Report*. California's Fourth Climate Change Assessment. Publication number: SUM-CCCA4-2018-009.

[19] Bedsworth et al. 2018. Statewide Summary Report. California's Fourth Climate Change Assessment. Publication number: SUMCCCA4-2018-013.

- A warm/dry simulation (HadGEM2-ES),
- A cooler/wetter simulation (CNRM-CM5),
- An average simulation (CanESM2), and
- The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5).

3.2.1 Direct Effects of Climate Change

There are two primary direct effects of climate change: changes in temperature and changes in precipitation. These changes include increases or decreases in temperature and precipitation. They also include changes in the frequency, duration, and intensity of changes to these patterns.

Changes in Temperature

According to Cal-Adapt, Encinitas's historical (1961-1990) annual average maximum temperature was 74.3°F, and the historic annual minimum temperature was 51.7°F. As shown in **Table 3-1: Change in Annual Average Temperature**, both are projected to increase by mid-century and further increase by the end of the century. The annual average maximum temperature in the City is projected to be 77.5°F by mid-century and 78.3°F by the end of the century under the medium emissions scenario. Under the high emissions scenario, the annual average maximum temperature in the study area is projected to be 78.6 °F by mid-century and 81.6 °F by the end of the century. This equates to an increase in temperatures of 4.3 to 7.3 °F by the end of the 21st century, depending on a medium or high emissions scenario.[20]

Table 3-1: Change in Annual Average Temperature

Annual Average Temperature	Historic Annual Average Temperature (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
Maximum	74.3	77.5	78.6	78.3	81.6
Minimum	51.7	54.8	55.8	55.9	59.1
F = degrees Fahrenheit					

California Energy Commission. 2022. CalAdapt. Local Climate Change Snapshot for Encinitas: Annual Average Maximum and Minimum Temperature. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

Annual Average Minimum Temperature

According to Cal-Adapt, the annual average minimum temperature is expected to increase in Encinitas (**Table 3-1**), consistent with the projected trend of overall warming for the City. Under the RCP 4.5 scenario, average minimum temperatures are projected to increase by approximately 4.1°F by 2100. Under the RCP 8.5 scenario, an increase of approximately 7.4°F for average minimum temperatures by 2100 is projected. With increasing minimum temperatures, it is anticipated that the City will experience warmer conditions throughout the year; however, this does not preclude severe winter weather events from occurring.

Changes in Precipitation

Annual Average Precipitation Levels

According to Cal-Adapt, annual projected precipitation levels in the City are expected to experience modest change by the end of the century. Table 3-2: Change in Annual Average Precipitation identifies estimated

[20] California Energy Commission. 2022. Cal-Adapt Data Download Tool: LOCA Downscaled CMIP5 Climate Projections. https://cal-adapt.org/data/download/. Accessed March 31, 2022.

annual average precipitation levels. These projections suggest that precipitation levels will be similar to conditions currently experienced within the City during average years.

Table 3-2: Change in Annual Average Precipitation

Average Annual Precipitation	Historic Annual Average Precipitation (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	11.9	11.3	11.5	11.3	10.9

CalAdapt. Local Climate Change Snapshot for Encinitas: Annual Average Precipitation. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

3.2.2 Indirect Effects of Climate Change

This analysis addresses five indirect effects of the projected changes in temperature and changes in precipitation: Extreme heat events, drought, wildfire and smoke, flooding, and liquefaction.

3.2.2.1 EXTREME HEAT EVENTS

Extreme heat events are a period when temperatures are abnormally high relative to a designated location's normal temperature range. Extreme heat events are one of the leading weather-related causes of death in the United States—from 1999 through 2009, extreme heat exposure caused more than 7,800 deaths.[21] There are generally three types of extreme heat events:

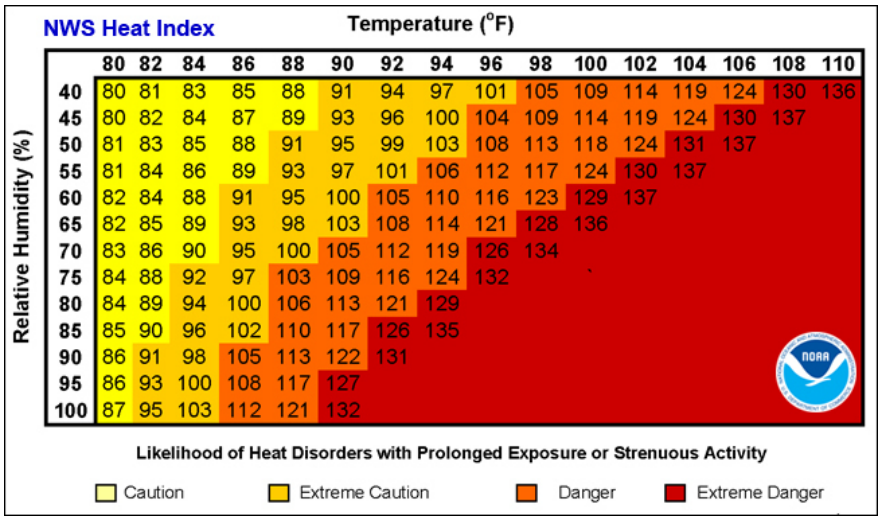
- **Extreme Heat Days:** a day during which the maximum temperature surpasses 98 percent of all historic high temperatures for the area, using the time between April and October from 1961 to 1990 as the baseline.
- **Warm Nights:** a day between April and October when the minimum temperature exceeds 98 percent of all historic minimum daytime temperatures observed between 1961 and 1990.
- **Extreme Heat Waves:** a successive series of extreme heat days and warm nights where extreme temperatures do not abate. While no universally accepted minimum length of time for a heat wave event exists, Cal-Adapt considers four successive extreme heat days and warm nights to be the minimum threshold for an extreme heat wave.

Extreme heat events will feel different from region to region since different areas have different historic high temperatures. For example, an extreme heat day on the coast will feel different from that in the High Desert. The reason for this is how humidity plays a factor in the perceived heat that people feel. Humid conditions will make a day feel hotter than non-humid conditions, even though the temperature may be the same. The difference between the perceived and actual temperatures is known as the "heat index." To illustrate the effect of the heat index, a 90-degree day with 50 percent humidity feels like 95°F, whereas a 90°F day with 90 percent humidity feels like 122°F. **Figure 3-1: National Weather Service Heat Index** shows the National Oceanic and Atmospheric Administration (NOAA) 's National Weather Service Heat Index.[22]

[21] United States Global Change Research Program, 2016: The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. A. Crimmins, J. Balbus, J. L. Gamble, C. B. Beard, J. E. Bell, D. Dodgen, R. J. Eisen, N. Fann, M. D. Hawkins, S. C. Herring, L. Jantarasami, D. M. Mills, S. Saha, M. C. Sarofim, J. Trtanj, and L. Ziska, Eds.

[22] National Oceanic and Atmospheric Administration (NOAA)'s National Weather Service Heat Index. https://www.weather.gov/safety/heat-index. Accessed March 31, 2022.

Figure 3-1: National Weather Service Heat Index



Source: National Oceanic and Atmospheric Administration National Weather Service Heat Index.

Historical Extreme Heat Events

Local data from within Encinitas is available using the National Weather Service Carlsbad McClellan Palomar Airport station. The data indicates that the average maximum temperature for the area from all years between 1991 and 2020 is 75.8°F, occurring in the month of August.[23] Given that the minimum threshold for an extreme heat day is 94.4°F, it is rare that the temperature exceeds this threshold in Encinitas on a regular basis. However, extreme heat events have occurred in the region, which occasionally impact the City. Significant historic extreme heat events include:

- May 2015: Strong high pressure and a strong late-season Santa Ana wind event combined to bring record temperatures exceeding 100° to the lower elevations. All-time high temperature records for the month of May were broken.[24]
- September 4-6, 2020. Forecasters issued Excessive Heat Warnings from the coast to the deserts through Labor Day. Beach temperatures were predicted to hit upwards of 95 while coastal areas could reach 105. Carlsbad McClellan Palomar Airport reached 101 degrees on September 6th.[25]
- January 15, 2021. Carlsbad McClellan Palomar Airport noted the highest maximum ever for January of 90 degrees.[26]

Unusually hot days and multi-day heat waves are a natural part of day-to-day variation in weather. As the Earth's climate warms, however, hotter-than-usual days and nights are becoming more common, and heat waves are expected to become more frequent and intense. Increases in these extreme heat events can

[23] National Weather Service. NOWData Carlsbad McClellan Palomar AP. https://www.weather.gov/wrh/climate?wfo=sgx. Accessed March 31, 2022.
[24] National Oceanic and Atmospheric Administration. May 2017. "A History of Significant Weather Events in Southern California." https://www.weather.gov/media/sgx/documents/weatherhistory.pdf
[25] North Coast Current. 2020. North coastal San Diego faces Labor Day broil as heat wave settles in. https://www.northcoastcurrent.com/encinitas/2020/09/north-coastal-san-diego-faces-labor-day-broil-as-heat-wave-settles-in/, September 4. Accessed July 14, 2022.
[26] National Weather Service. NOWData Carlsbad McClellan Palomar AP. https://www.weather.gov/wrh/climate?wfo=sgx. Accessed July 14, 2022.

lead to more heat-related illnesses and deaths, especially if people and communities do not take steps to adapt.[27]

VULNERABILITY TO EXTREME HEAT EVENTS

Exposure

The Fourth Assessment indicates that Southern California can expect longer and hotter heat wave, with continued future warming over the region.[28] The annual mean maximum temperature could increase by 7.3°F by 2100 (see **Table 3-1**).[29] As illustrated in **Table 3-3: Change in Number of Extreme Heat Days**, the annual number of extreme heat days (over 94.4°F) in Encinitas could increase up to 24 days by 2100.[30]

Table 3-3: Change in Number of Extreme Heat Days

Number of Extreme Heat Days*	Historic Annual Average Extreme Heat Days (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	4	9	12	12	28
***Number of days in a year when daily maximum temperature is above a threshold temperature of 94.4 °F**					

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Encinitas: Extreme Heat Days. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

Warm Nights

According to Cal-Adapt, a warm night event in Encinitas is a night when the evening temperature exceeds 67.3°F. **Table 3-4: Change in Number of Warm Nights** identifies the projected average number of warm nights that would occur each year under the RCP 4.5 and RCP 8.5 scenarios. By 2100, an estimated 35 to 72 warm nights (RCP 4.5 and RCP 8.5, respectively) could be experienced (compared to only four days annually based on observed historical conditions).

Table 3-4: Change in Number of Warm Nights

Number of Warm Nights*	Historic Annual Average Warm Nights (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	4	25	35	34	72
***Number of days in a year when daily minimum temperature is above a threshold temperature of 67.3**					

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Encinitas: Warm Nights. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

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[27] Sarofim, M.C., S. Saha, M.D. Hawkins, D.M. Mills, J. Hess, R. Horton, P. Kinney, J. Schwartz, and A. St. Juliana. 2016. Chapter 2: Temperature-related death and illness. In: The impacts of climate change on human health in the United States: A scientific assessment. U.S. Global Change Research Program.

[28] Southern California Association of Governments. Southern California Climate Adaptation Planning Guide. October 2020.

[29] California Energy Commission. 2022. CalAdapt. Local Climate Change Snapshot for Encinitas: Annual Average Maximum Temperature. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

[30] California Energy Commission. 2022. CalAdapt. Local Climate Change Snapshot for Encinitas: Extreme Heat Days. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

Sensitivity: Physical

The impacts of extreme heat events will be most severely felt in highly developed areas of Encinitas that are mostly paved and surrounded by buildings constructed of dark (heat absorbing) materials without the cooling benefits of tree shade. Urbanized areas can experience higher temperatures, greater pollution, and negative health effects, especially during summer months, than rural communities. This phenomenon is known as the Urban Heat Island Effect (UHIE). Urban heat islands are created by a combination of heat-absorptive surfaces (e.g., dark pavement and roofing), heat-generating activities (e.g., automobile engines and industrial generators), and the absence of "green spaces" (vegetative surfaces that provide evaporative cooling). During extreme heat days and heatwaves, asphalt and darker surfaces reduce nighttime cooling (as retained heat is released from these surfaces). The UHIE is known to intensify extreme heat days and heatwaves.

As illustrated in **Figure 3-2: Urban Heat Island Index**, due to coastal wind patterns, the UHIE is relatively low in Encinitas. The Urban Heat Island Index (UHII) is calculated by atmospheric modeling as a temperature differential over time between an urban census tract and nearby upwind rural reference points at a height of two meters above ground level, where people experience heat. The modeling covered 182 warm season days from 2006 and 2013, with one-hour timesteps, so the UHII is the sum of 24 * 182 = 4,368 hourly temperature differences. Since 2020, the index is also reported in degree-hours per day on a Celsius scale – a measure of heat intensity over time, calculated by dividing the UHII by 182 days. An increase of one degree over an eight-hour period would equal eight degree-hours, as would an increase of two degrees over a four-hour period.[31]

As illustrated in **Figure 3-2: Urban Heat Island Index**, the City is not severely impacted by the UHIE that may intensify extreme heat days and heatwaves. However, even without a large UHIE, the City is still projected to have extreme heat days, and many types of infrastructure are affected by extreme heat, including roads and rails. High temperatures increase the risk of pavement deterioration, depending on the paving materials and the traffic load of a given road.[32, 33] The type of pavement used is typically based on historical climate conditions; the increasing occurrence of frequent and prolonged extreme heat outside of historical norms will present challenges to the roadway system.[34] Extreme heat may also cause pavement heave and damage to transportation infrastructure and functioning.[35] Extreme heat is also problematic for rail systems, as railroad tracks exposed to high temperatures are at risk of warping or buckling.[36]

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[31] California Environmental Protection Agency. 2022. Urban Heat Island Interactive Maps. https://calepa.ca.gov/urban-heat-island-interactive-maps-2. Accessed April 12, 2022.

[32] Daniel, J.S., J.M. Jacobs, E. Douglas, R.B. Mallick, and K. Hayhoe. 2014. Impact of climate change on pavement performance: Preliminary lessons learned through the Infrastructure and Climate Network (IC Net). dot:10.1061/9780784413326.001.

[33] Rowan, E., C. Evans, M. Riley-Gilbert, R. Hyman, R. Kafalenos, B. Beucler, B. Rodehorst, A. Choate, and P. Schultz. 2013. Assessing the sensitivity of transportation assets to extreme weather events and climate change. Transportation Research Record: Journal of the Transportation Research Board 2326(1):16—23. doi:10.3141/2326-03.

[34] Holsinger, H. 2017. Preparing for change. FITWA-HRT-17-002. Public Roads 80(4). McLean, VA: Office of Research, Development, and Technology, Federal High Administration. https://highways.dot.gov/public-roads/januaryfebruary-2017/preparing-change. Accessed April 11, 2022.

[35] Guo Y, Gasparrini A, Li S, Sera F, Vicedo-Cabrera AM, de Sousa Zanotti Stagliorio Coelho M, et al. (2018) Quantifying excess deaths related to heatwaves under climate change scenarios: A multicountry time series modelling study. PLoS Med 15(7): e1002629.

[36] Magill, B. 2014. "Sun kinks" in railways join the list of climate change's toll. Scientific American, June 2. www.scientificamerican.com/article/sun-links-in-railways-Join-the-list-of-climate-change-s-toll. Accessed April 11, 2022.

As heat waves worsen, energy systems will need to adapt to help communities and businesses cope with rising temperatures. Access to air conditioning will be vital for vulnerable populations, even life-saving for the elderly, young children, and those with pre-existing health conditions. However, increased cooling needs for both air conditioning and refrigeration will place significant stress on the power system during periods of extreme heat. And if that power comes from fossil-fired power plants, there may also be an increase in soot, smog, and other forms of air pollution with the associated public health consequences.[37] Impacts on electricity resources from climate hazards can include stress and physical damage to the electricity generation, transmission, and distribution system. Transmission facilities face increasing climate change-related risks because of the increased frequency of wildfires, severe wind, and extreme heat. Extreme heat and drought can add stress to transmission systems, resulting in system failure. Electrical infrastructure may fail due to increased electrical loads and stress from longer periods of increased operation.

Sensitivity: Social

Temperature-related mortality (including from extreme heat) is projected to be among the most deadly and costly impacts of climate change in certain locations around the globe. Higher temperatures and extreme heat can lead to heatstroke and increase the risk of or exacerbate cardiovascular disease, respiratory disease, kidney failure, and preterm births. Significant differences in the projected number of heat-related deaths also exist within a particular region or City. For instance, urban areas with a large area of impervious surfaces and little shade— also known as urban heat islands—tend to be hotter than surrounding areas.

Even though extreme heat will be more frequent and severe in hotter regions of the state, one national study estimates that temperature-related mortality is projected to be higher in cooler regions because they are less prepared for the heat (for example, fewer buildings have air conditioning).

Warm night temperatures affect the ability of a community and its residents to effectively cool down from extreme heat days. If temperatures remain higher than normal during the night, the compounding impacts from high daytime temperatures can be highly detrimental to public health. Based on these projections, the City can anticipate increased demand – towards the end of the century – for cooling centers and calls for service from vulnerable populations, which are expected to be disproportionately impacted by extreme heat conditions.

Figure 3-3: Heat Health Action Index: Encinitas displays the Heat Health Action Index (HHAI) from the California Natural Resources Agency's California Heat Assessment Tool (CHAT). CHAT uses a dataset designed to investigate how the frequency of heat health events will change throughout the 21st century. The HHAI is a statistically weighted result of social (e.g., education, income, linguistic isolation), health (e.g., asthma, percent low birth weight), and environmental (e.g., pollution, tree canopy) indicators and is intended to represent overall heat vulnerability. Represented by the US Census Tract, the range is from 0 to 100, with lower scores representing less heat vulnerability. All Encinitas census tracts are projected to have low vulnerability to heat which corresponds to Cal-Adapts projections for the number of Extreme Heat Days through the end of the century (see **Table 3-3**).

[37] Abel, D.W., T. Holloway, M. Harkey, P. Meter, D. Ahl, V.S. Limaye, and J.A. Patz. 2018. Air-quality-related health impacts from climate change and from adaptation of cooling demand for buildings in the eastern United States: An interdisciplinary modeling study. PLOS Medicine 15(7):1—27.dot:10.1371/journal.pmed.1002599.

Figure 3-2: Urban Heat Island Index

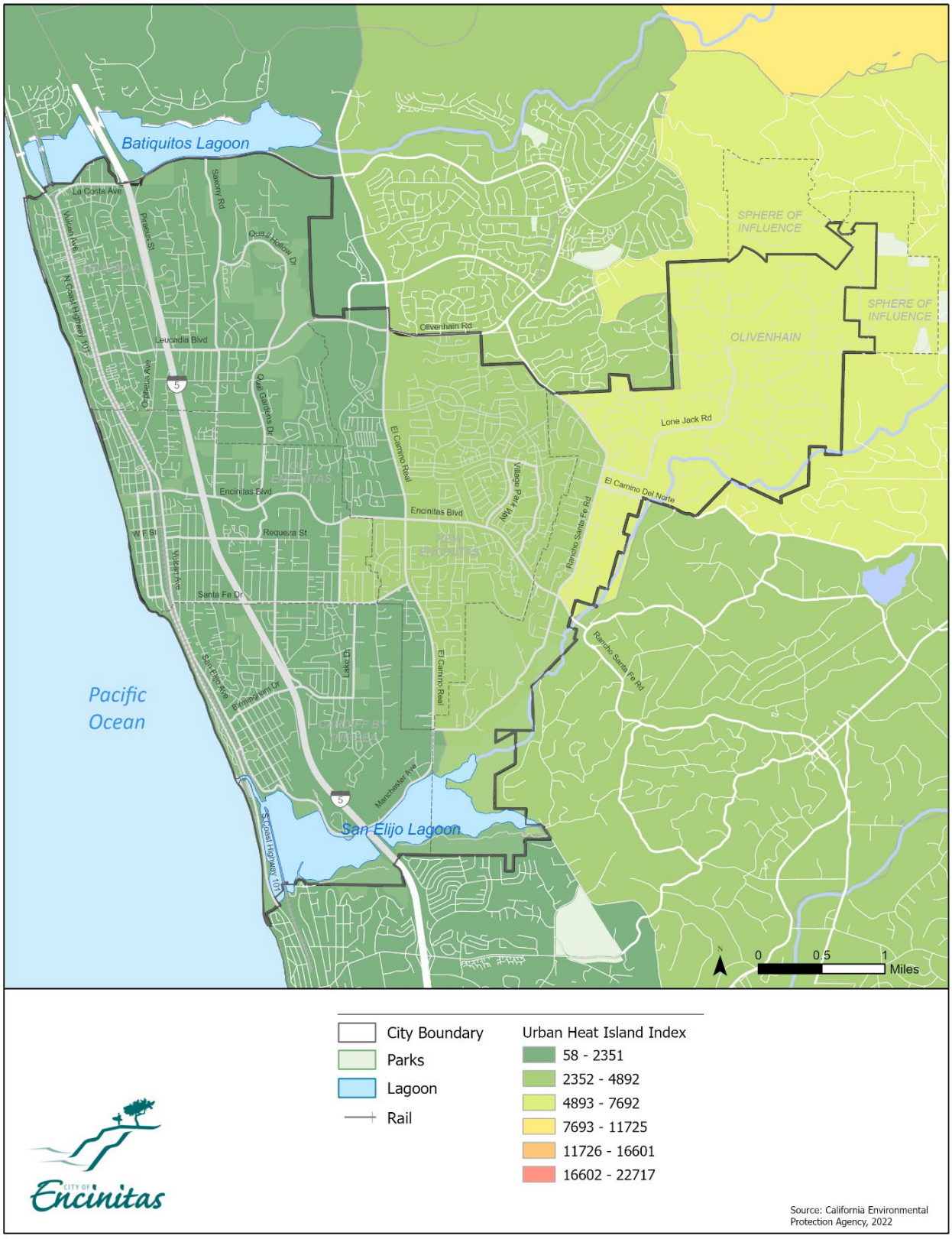
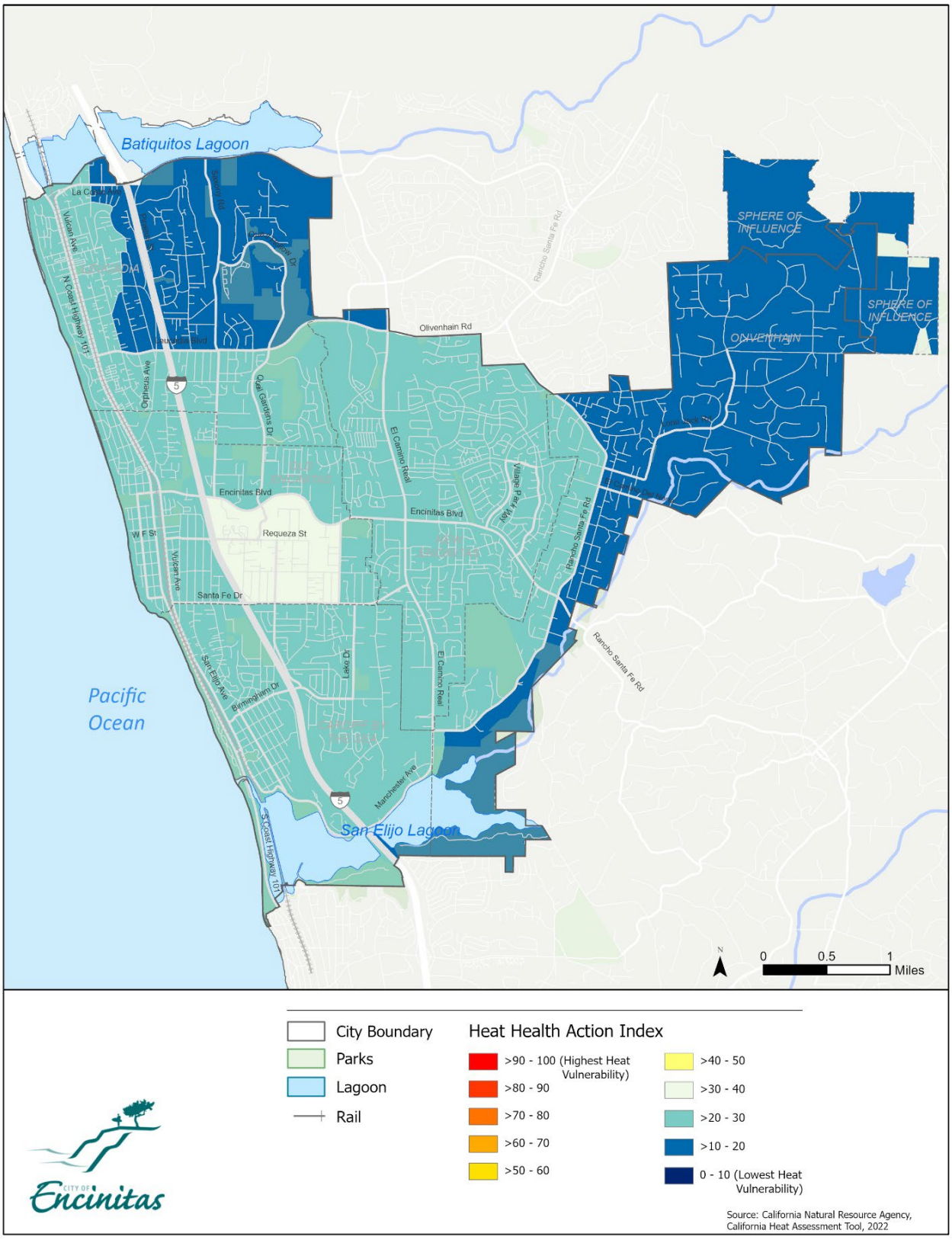


Figure 3-3: Heat Health Action Index: Encinitas



While the general population of Encinitas may be less vulnerable to extreme heat events, people have unique and individual thresholds. Extreme heat events, including heat waves, can lead to illness and death, particularly among older adults, the very young, and other vulnerable populations.

Adaptive Capacity

Current research indicates that most people can adapt biologically and physically to incremental increases in average normal temperatures. Children, pregnant women, and older adults are more susceptible to adverse effects because they are less able to regulate their body temperatures. Other at-risk groups include individuals working outdoors, outdoor athletes, the socially isolated, those with incomes below the federal poverty level, and communities of color. Continuous exposure to increased heat over time will impact how individuals are able to work and play both now and in the future.[38]

Over extended periods of time, individuals and communities can adapt to their local climates. When both warmer and colder temperatures go above or below those norms rapidly, scientific evidence shows that people become vulnerable to associated health effects related to those extremes. Studies suggest that climate change will increase the severity and frequency of extreme temperature conditions, leading to increases in temperature-related illness and death.

Beaches can help the public stay cooler during heat events, as the coastline in Encinitas is cooler than areas further inland and provides access to the ocean. The beach also provides a buffer between the ocean and the City's built infrastructure, helping to reduce erosion from waves and storm events. If beaches were to be impacted by climate hazards, they could lose the ability to provide these key amenities.

Regulation and Planning

California is dedicated to addressing the climate change impacts on transportation infrastructure, including funding and research initiatives as well as department- and agency-led projects to assess climate-related vulnerabilities and plan for more climate-resilient transportation infrastructure.

- Chapter 5 of 2017 (SB 1, Beall) Provided $20 Million for Climate Adaptation Planning Grants to prepare for and reduce damage from climate change impacts on transportation infrastructure.
- Chapter 118 of 2016 (AB 2800, Quirk) Established the Climate-Safe Infrastructure Working Group to convene a working group consisting of engineers, scientists, and architects to examine how to incorporate climate change impact data into state infrastructure planning, design, construction, operations, and maintenance.
- Agency (CalSTA) Developed Climate Action Plan for Transportation Infrastructure. Developed in response to Executive Order N-19-19, which called for CalSTA to leverage discretionary state transportation funds to reduce GHG emissions in the transportation sector and adapt to climate change.

Renewable energy and electricity storage technologies can add flexibility to the electricity grid. Together with microgrids, renewables can support increased grid resilience and reliability in the face of extreme

[38] National Institute of Heath, National Institute of Environmental Health Sciences. 2022. *Temperature-related Death and Illness*. https://www.niehs.nih.gov/research/programs/climatechange/health_impacts/heat/index.cfm#footnote1 Accessed April 7, 2022.

weather. Electricity storage also has the potential to replace fossil-fired "peaking" power plants, which are called upon in times of high demand for electricity, such as during extreme heat events.[39]

The City has addressed extreme heat events in planning documents such as the Climate Action Plan, Hazard Mitigation Plan, and the Urban Forest Management Plan. The City also operates programs that respond to extreme heat events for displaced residents. Finally, the City also has regulations in place that are beneficial during extreme heat events by limiting further potential public health impacts. The plans and programs for the City and supporting agencies are described below.

City of Encinitas Climate Action Plan (2020)

The City's Climate Action Plan contains actions to mitigate temperature-related effects and improve heat resiliency to protect its populations, functions, and structures in the short- and long-term. Strategies to mitigate the impacts of the UHIE, include:

- Incorporation of green infrastructure strategies by reducing the area of heat-absorbing paved surfaces and increasing landscaped area with planted vegetation, including shade trees.
- Promoting the use of solar carports on new and existing surface parking lots to mitigate heat absorption.
- Promoting the use of passive cooling design.
- Conduct outreach to educate City residents on the health risks associated with extreme heat events and strategies to prepare for these events.
- Coordinate with relevant agencies to better plan and prepare for extreme heat events and the increased demand for emergency services associated with these events.
- Work with local and regional employers to ensure worker protection measures are in place for extreme heat events.
- Work with local businesses and institutions to provide a network of "Cool Zone" areas.
- Participate in beach nourishment projects that maintain local wide sandy beaches. Encinitas beaches are considered regional "Cool Zones."

San Diego County Multi-jurisdictional Hazard Mitigation Plan (2017)

The 2017 MJHMP includes objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 8 of the 2017 MJHMP Chapter on Encinitas intends to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to severe weather, including extreme heat." The goal includes three corresponding objectives and seven actions to help the City prepare for the impacts of extreme heat events. Objectives and actions focus on planning, protecting vulnerable assets susceptible to extreme heat, and public education.[40]

Urban Forest Management Program

Trees are a source of shade, air conditioning, and other environmental benefits and yield both a high quality of life and economic benefits to the community, including enhanced property values. The City recognizes that its urban forest is an integral part of its infrastructure, providing significant ecological, social, and

[39] Abel, D.W., T. Holloway, M. Harkey, P. Meter, D. Ahl, V.S. Limaye, and J.A. Patz. 2018. Air-quality-related health impacts from climate change and from adaptation of cooling demand for buildings in the eastern United States: An interdisciplinary modeling study. PLOS Medicine 15(7):1—27. dot:10.1371/journal.pmed.1002599.
[40] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

economic benefits, including improved air quality, reduced erosion and stormwater runoff, energy conservation, improved health, and enhanced livability.[41] The City's Tree Ordinance and Urban Forest Management Policy (2009) are its primary regulatory tools to provide for orderly protection of trees, promote the health, safety, welfare, and quality of life for the residents of the City, to protect property values, and to avoid significant negative impacts on adjacent properties.[42]

Leaf Blower Ordinance

Air pollution exposure is one of the primary concerns of SB1000 because of the historically larger detrimental effects on vulnerable communities. On August 21, 2019, the Encinitas City Council voted unanimously in favor of passing a progressive Leaf Blower Ordinance to help the City transition away from fossil-fuel-based off-road equipment. The benefits of prohibiting gas-powered leaf blowers include avoiding greenhouse gas emissions; decreasing noise levels; and reducing suspended dust, allergens, and other harmful particulates.[43]

Emergency Shelters

Hazardous climate events, such as extreme heat or flooding, may potentially displace Encinitas residents or the already homeless. Those displaced will require temporary shelter during hazardous conditions and severe weather events with supplies that can increase the adaptive capacity of individuals experiencing homelessness.

In February 2019, the City of Encinitas adopted Ordinance 2019- 01, which permitted emergency shelters within the Light Industrial (LI) and Business Park (BP) zones as required by California Government Code Section 65583(a)(4) (A- D). In selecting an appropriate location for emergency shelters, access to public transit was an important consideration, as individuals and households experiencing homelessness do not have reliable means of transportation. The LI and BP zones are well served by public transportation and regional connections providing access to jobs and services.

Cool Zones

The Cool Zone program is an established network of free, air-conditioned settings (such as libraries or community centers) across San Diego County that allow respite for older adults, persons with disabilities, or anyone looking to escape the extreme heat during the summer. Cool Zones are a way for residents to lower individual utility usage and help conserve energy for the whole community. In partnership with San Diego Gas & Electric (SDG&E), the Cool Zone program is managed by Aging & Independence Services (AIS), a division of the County of San Diego Health and Human Services Agency.

The Community Resource Center (CRC) is an important local partner to the City in providing housing navigation and supportive services for those experiencing homelessness and other at-risk populations. The facility is a County designated "Cool Zone" making it a local respite from hot weather.[44] The Encinitas Public

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[41] City of Encinitas. 2009. Urban Forest Management Program Council Policy C027.

[42] City of Encinitas. 2022. Urban Forest Management Program. https://encinitasca.gov/Government/Departments/Public-Works/Urban-Forest-Management-Program. Accessed April 11, 2022.

[43] City of Encinitas. 2019. *Leaf Blower Ordinance.* *https://encinitasca.gov/leaf-blower-ordinance.* Accessed April 11, 2022.

[44] City of Encinitas. 2022. Community & Senior Center. https://encinitasca.gov/Residents/Senior-Citizens/Community-Senior-Center. Accessed July 14, 2022.

Library, Cardiff-by-the-Sea Library, and the Community Senior Center are also San Diego County designated Cool Zone facilities.[45]

The City of Encinitas has partnerships with regional service providers. The City provides Community Development Block Grant program funds to homeless service providers for homeless prevention and regional shelter efforts. Other North County facilities and services for those experiencing homelessness include (with distance from Encinitas in parenthesis):

- Mental Health Systems (Oceanside— 12.2 miles)
- Interfaith Community Services (Vista — 16.4 miles)
- La Posada Shelter (Carlsbad — 7.8 miles)
- Women's Resource Center (Oceanside — 12.2 miles)
- Operation Hope (Vista — 15.6 miles)
- Haven House (Escondido— 16.4 miles)
- Interfaith Community Services (16.4 miles)
- North County Lifeline (Oceanside 13.1)
- Oceanside Transit Center (Oceanside — 13.1 miles)[46]

3.2.2.2 DROUGHT + WATER SUPPLY

Warmer temperatures also contribute to more frequent and intense droughts by leading to a decline in and faster melting of winter snowpack, greater rates of evaporation, and drier soils. These conditions decrease the amount of spring and early summer snowmelt runoff upon which the state historically has depended for its annual water supply, while they increase the demand for irrigation water in both agricultural and urban settings. The period of 2012 through 2015 represents the state's four driest consecutive years on record in terms of statewide precipitation, and 2021 is the third driest single year. Moreover, 2022 already experienced the driest consecutive January and February in the Sierra Nevada, based on records dating back over one hundred years.

Drought may lead to water-related problems. When rainfall is less than normal for weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water-supply problems develop, the dry period can become a drought.[47]

As a result, droughts have widespread impacts across the state, including mandatory water use restrictions, reductions in agricultural crop production, over-pumping of groundwater—which damages infrastructure from land sinking and dries up domestic wells in communities—and degraded habitats for fish and wildlife.[48]

Historical Drought Events

The 2007–2011 California drought marked the beginning of increased restrictions on State Water Project (SWP) pumping from the Bay-Delta due to environmental considerations. In April 2007, Metropolitan Water

[45] San Diego County Health and Human Services Agency. 2022. Cool Zones. https://www.sandiegocounty.gov/hhsa/programs/ais/cool_zones/. Accessed July 14, 2022.
[46] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029.
[47] United States Geological Survey. 2022. California Water Sciences Center. California Drought. https://ca.water.usgs.gov/california-drought/what-is-drought.html. Accessed April 12, 2022.
[48] State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. https://lao.ca.gov/Publications/Report/4575. Accessed April 11, 2022.

District of Southern California (MWD) notified its member agencies that it expected challenges in meeting demands due to insufficient imported water supplies from the SWP and the Colorado River. To meet demands, MWD announced that it would implement shortage-related actions consistent with its Water Surplus and Drought Management Plan (WSDMP).

In January 2014, Governor Brown proclaimed a state of emergency throughout California, calling for increased conservation across the state. In response to the governor's drought declaration and call for conservation, the Water Authority activated its WSDRP for the second time since its adoption in 2006, declaring in February 2014 a regional drought response Stage I, Voluntary Supply Management. On April 2, 2017, Governor Brown lifted the drought emergency. This five-year drought (2012 – 2016), which is the most recent, has well-documented agricultural (e.g., extremely agricultural surface water allocations), physical (e.g., groundwater depletion-related subsidence) and environmental impacts (e.g., fish mortality). Surface and groundwater withdrawals were used to mitigate water supply impacts. Water transfers were a primary tool to move water to areas of need, such as permanent crops.[49]

On April 21, May 10, and July 8, 2021, Governor Newsom issued proclamations that a state of emergency exists in a total of 50 counties due to severe drought conditions and directed state agencies to take immediate action to preserve critical water supplies and mitigate the effects of drought and ensure the protection of health, safety, and the environment. On October 19, 2021, Governor Newsom signed a proclamation extending the drought emergency statewide and further urging Californians to reduce their water use.

On January 4, 2022, the State Water Resources Board passed Resolution No. 2022-0002 adopting an emergency regulation to supplement voluntary water conservation. [50]

As of May 24, 2022, new statewide regulations prohibit watering decorative grass in common areas of subdivisions and homeowners associations, as well as on commercial, industrial, and institutional properties.[51]

Vulnerability to Drought

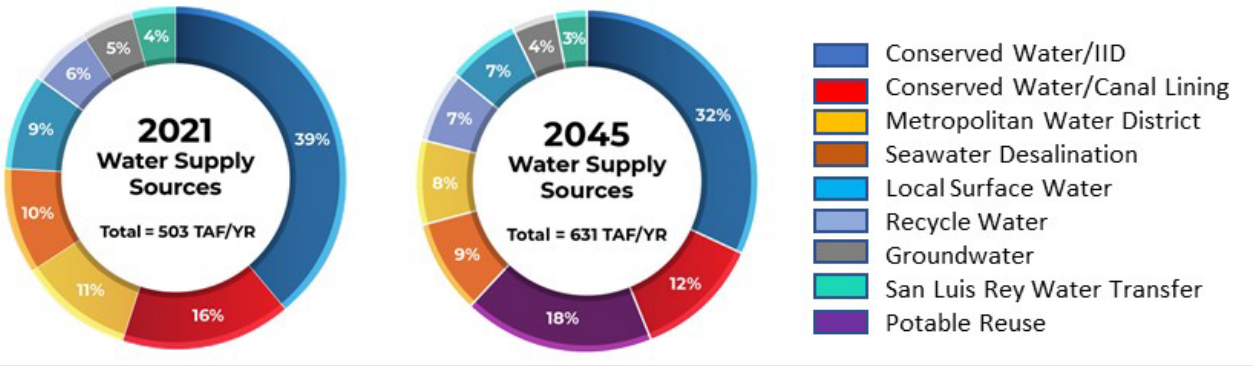
Exposure

Drought conditions in Encinitas are contingent upon precipitation and snowpack conditions in other parts of the state and region in which Encinitas' potable water is sourced – the Sierra Nevada and Colorado River Basin. The western United States, including California, and by default Encinitas, has been experiencing prolonged periods of drought. Recent research suggests that extended drought occurrence (a "mega-drought") could become more pervasive in future decades. An extended drought scenario is predicted for all of California from 2025 to 2075 under the HadGEM2-ES simulation and high emissions scenario. The extended drought scenario is based on the average annual precipitation between 1961 and 1990 of 10.9 inches. However, as shown in **Figure 3-4: Water Resource Portfolio for San Diego County**, the San Diego

[49] United States Geological Survey. 2022. California Water Sciences Center. California Drought. Comparisons. 2012-2016 California Drought: Historical Perspectives. https://ca.water.usgs.gov/california-drought/california-drought-comparisons.html. Accessed July 13, 2022.
[50] California Department of Water Resources. 2022. Resolution no. 2022-0002 to adopt an emergency regulation to supplement voluntary water conservation. January 4.
[51] San Diego County Water Authority. 2022. Summer of Water Savings, State Mandates. June 21, 2022.

County Water Authority has diversified water sources that are projected to supply water to the region for years to come.[52]

Figure 3-4: Water Resource Portfolio for San Diego County



Source: San Diego County Water Authority. 2022. Water Resource Portfolio. https://www.sdcwa.org/your-water/. Accessed July 15, 2022.

Sensitivity: Physical and Social

Encinitas' drought vulnerability is tied to the vulnerability of imported water purchased from the SDCWA, local surface water from Lake Hodges, and recycled water purchased from the San Elijo Joint Powers Authority.[53]

Changes in rainfall and snowmelt timing in water supply source areas can affect SDCWA's ability to provide adequate and safe drinking water on a reliable basis. As temperatures in Encinitas and the surrounding areas increase, there will also be a higher demand for potable water. While SDCWA may be able to rely on groundwater to provide additional supply, drawing from these sources can substantially lower water tables, resulting in land subsidence. Furthermore, drought conditions can increase the concentration of industrial chemicals, heavy metals, and agricultural runoff contaminants in groundwater.[54] Precipitation variability will also affect the local surface and groundwater supply causing the region to rely on other sources such as desalination and potable reuse. It is estimated that by 2040, countywide water demand will increase by 30 percent from 2015 levels due to population and economic growth, further straining the need for a sustainable water supply.[55] Increased episodes of drought and increased water demand could result in water shortages for the region, endangering ecological systems (e.g., flood control or sensitive habitat, recreational areas).

As vegetation changes because of drought conditions, the animal species that depend on certain plant communities for food supply and habitat may be affected. The projected increase in the duration of

[52] California Energy Commission. Cal-Adapt. 2022. Extended Drought Scenarios. https://cal-adapt.org/tools/extended-drought/#lat=33.0450&lng=-117.2539&boundary=place&climvar=Wildfire. Accessed April 12, 2022.
[53] San Dieguito Water District. 2020 Urban Water Management Plan, Final. June 2021. https://encinitasca.gov/Portals/0/City%20Documents/Documents/San%20Dieguito%20Water%20District/Engineering/SDWD_2020%20reduced.pdf?ver=2021-06-10-145230-143. Accessed July 12, 2022.
[54] Rudolph, L., Harrison, C., Buckley, L. & North, S. 2018. Climate Change, Health, and Equity: A Guide for Local Health Departments. Oakland, CA and Washington D.C., Public Health Institute and American Public Health Association.
[55] San Diego County Water Authority. 2016. *Urban Water Management Plan*.

droughts through the end of the century may threaten ecosystems as species become weak due to limited access to water and become susceptible to disease, pests, and decay.[56]

Adaptive Capacity

The City's reliance on various regional water resources, including the San Diego Water Authority, will remain a critical issue for the City's resilience to drought periods. The City will consider how future supply and demand for water resources in the region may change because of climate change. Considering conservation programs, maintenance of current adjudicated surface water rights, recycled water supply, and additional imported water from SDCWA, the City anticipates having sufficient water supply to meet current and future customers' needs through at least 2035. Therefore, water supply does not place a constraint on near-term development. The Olivenhain Municipal Water District, a member of the SDCWA, has stated their commitment to protecting its water sources, and continually looks for ways to increase its local supply. Programs include groundwater basin studies, recycled water, watershed outreach and education, and joint projects such as the Olivenhain Water Storage Project and the North San Diego County Regional Recycled Water Project.[57]

The City has addressed drought in planning documents such as the Climate Action Plan and Hazard Mitigation Plan. Finally, the City and the water districts that supply water to the Encinitas have regulations, plans, and programs in place that are beneficial during periods of drought by limiting water use. The plans and programs for the City and supporting agencies are described below.

City of Encinitas Climate Action Plan (2020)

Considering the potential decrease in regional water resources available to the City due to decreases in annual precipitation, the City will implement the following strategies to increase the community's resilience with regard to water supplies:

- Coordinate with local and regional partners (SDWD, OMWD, SDCWA) to support and improve water conservation efforts and programs for City residents.
- Expand and/or improve the recycled water efforts currently in place at the San Elijo Water Reclamation Facility.
- Work with relevant water agencies, including SDCWA, OMWD, and SDWD, to evaluate current and future water supply systems and vulnerabilities.
- Continue marketing and outreach programs to promote participation in existing water conservation rebate and incentive programs in the region.[58]

San Diego County Multi-jurisdictional Hazard Mitigation Plan (2017)

The 2017 MJHMP includes objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 9 of the 2017 MJHMP Chapter on Encinitas intends to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to drought". The goal includes four corresponding

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[56] California Natural Resources agency, Governor's Office of Planning and Research, and California Energy Commission. 2019. California's Fourth Climate Change Assessment; San Diego Region Report. Available: https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-009_SanDiego_ADA.pdf. Accessed April 12, 2022.

[57] Olivenhain Municipal Water District. 2022. https://www.olivenhain.com/your-water-supplies/overview/. Accessed July 15, 2022.

[58] City of Encinitas, Climate Action Plan. November 2020.

objectives and fifteen actions to help the City prepare for the impacts of drought. Objectives and actions focus on planning, protecting vulnerable assets susceptible to wildfire/structural fires, agency coordination, and public education, as follows:

Objective 9.A.1: Develop a comprehensive approach to reducing the possibility of damage and losses due to drought.

Action 9.A.1: Continue to promote water conservation as a means to mitigate future drought conditions (Municipal Code 23.26), including criteria for drought related actions and updating of SDWD Drought Response Plan.

Objective 9.B: Protect existing assets with the highest relative vulnerability to the effects of drought.

Action 9.B.1: Continue the use of reclaimed water for landscaping at city parks and facilities, where available.

Action 9.B.2: Implement water efficiency upgrades at municipal buildings, parks and publicly owned facilities.

Action 9.B.3: Explore options of public outreach, including providing residents with resources for water efficient plumbing and landscaping.

Objective 9.C: Coordinate with and support existing efforts by federal, state, local governments, utility providers and other organizations to mitigate the effects of drought.

Action 9.C.1: Support groundwater recycling efforts by San Elijo JPA.

Action 9.C.2: Support regional efforts to diversify and improve water supply and delivery systems, including the construction of the Carlsbad desalination plant.

Action 9.C.3: Support OMWD water conservation initiatives, including the use of mandatory water restrictions as part of its drought response plan, when necessary.

Action 9.C.4: Continue to coordinate with other agencies to improve water reuse as part of the North County Water Reuse Coalition.

Action 9.C.5: Continue to work with State Water Resources Control Board, San Diego County Water Authority, Office of Emergency Services, SFID and OMWD to assess vulnerability to drought risk and monitor drought conditions.

Action 9.C.6: Support OMWDs efforts to extend recycled water to Village Park (through the conversion of Wiegand Tank) and possible conversion of Wankett Tank to recycled water tank as a regional project.

Action 9.C.7: Provide support for the implementation of ongoing Lake Hodges Water Quality Improvement Projects (Prop 84), which are important for improving the ability to transport local supplies in regional system.

Action 9.C.8: Remain informed of state legislation regarding drought and water conservation.

Objective 9.D: Educate citizens about drought, its potential impacts and opportunities for mitigation actions.

Action 9.D.1: Continue to provide outreach materials to residences within the city for water conservation, in coordination with SFID and OMWD.

Action 9.D.2: Encourage residents to adopt drought tolerant landscaping or xeriscape practices to reduce dependence on irrigation.[59]

City of Encinitas Water Efficient Landscape Regulation

The State Legislature determined in the Water Conservation in Landscaping Act (the "Act"), Government Code Section 65591 et seq., that the state's water resources are in limited supply. The Legislature also recognized that while landscaping is essential to the quality of life in California, landscape design, installation, maintenance, and management must be water efficient. The City implements this regulation via Chapter 23.26 Water Efficient Landscape Regulations.[60]

San Dieguito Water District (2022) Water Master Plan

The Water Master Plan for the San Dieguito Water District provides an assessment of the existing water system conditions and demands. The plans concluded that the overall system is adequately sized to accommodate future 2030 growth demands. In the San Dieguito Water District, the current average daily demand for the district is 6.63 million gallons per day. The Master Plan identifies areas for improvement that were then included in the future planning horizon CIP. These CIP upgrades include pipeline system upgrades, valve replacement, meter replacement, and treatment plant upgrades.[61]

Olivenhain Municipal Water District Urban Water Management Plan (2020)

Olivenhain Municipal Water District (OMWD) has prepared this 2020 Urban Water Management Plan (UWMP) to guide its conservation and water resource management programs and to comply with state law. The Urban Water Management Planning Act [California Water Code (CWC) §§ 10610 – 10656] (Act) requires urban water suppliers to report, describe, and evaluate various aspects of their water resources and plans for providing water service, such as:

- Water deliveries and uses
- Water supply sources
- Efficient water uses
- Demand Management Measures (DMMs); and
- Water shortage contingency planning

OMWD is a California public water system providing potable water, wastewater services, recycled water, hydroelectricity, and park services and is headquartered in Encinitas, San Diego County, California. In 2020, OMWD served 22,592 accounts and delivered 17,100 acre-feet (AF) of potable water. Under the Act, as amended, OMWD is required to submit an UWMP every five years and this report is the fiscal year (FY) 2020 plan.[62]

OMWD Drought Response

The State Water Resources Control Board officially prohibited certain wasteful water practices by introducing the conservation emergency regulation (State Water Resources Control Board Resolution No.

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[59] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.
[60]City of Encinitas Water Efficient Landscape Regulation. Chapter 23.26. https://library.qcode.us/lib/encinitas_ca/pub/municipal_code/item/title_23-chapter_23_26-23_26_090. Access April 13, 2022.
[61] San Dieguito Water District. October 2021. 2022 Water System Master Plan.
[62] Olivenhain Municipal Water District. 2021. 2020 Urban Water Management Plan. June.

2022-0002). Under a drought-related State of Emergency, the following wasteful water practices are officially prohibited:

- Outdoor landscape irrigation resulting in visible runoff to adjacent properties
- Outdoor landscape irrigation within 48 hours of measurable rainfall
- Washing cars using a hose without a shut-off nozzle
- Using potable water to clean hardscapes except in cases where health and safety are at risk
- Using potable water in non-recirculating ornamental fountains, ponds or lakes
- Using potable water for street cleaning or construction purposes except in cases where health and safety are at risk
- Using potable water for irrigation of non-functional turf

Note: There are water use prohibitions for homeowner associations during and after a drought state of emergency.

OMWD encourages the following voluntary conservation practices:

- Restrict outdoor irrigation to no more than three days per week under the following schedule
    - Odd-numbered houses irrigating on Sunday, Tuesday, and Thursday
    - Even-numbered houses irrigating on Monday, Wednesday, and Saturday
- Restrict outdoor irrigation to no more than 10 minutes per watering station for systems not using water-efficient devices
- Irrigate residential and commercial landscape before 10 a.m. and after 6 p.m. This shall not apply to the use of a hand-held hose equipped with a shut-off nozzle to water landscaped areas.
- Use a bucket, a watering can, a hand-held hose equipped with a shut-off nozzle, or low-volume, non-spray irrigation to water landscaped areas, including trees and shrubs, located on residential and commercial properties that are not irrigated by a landscape irrigation system.
- Irrigate nursery and commercial grower's products before 10 a.m. and after 6 p.m. Watering is permitted at any time with a hand-held hose equipped with a shut-off nozzle, or when a drip/micro-irrigation system/equipment is used. Irrigation of nursery propagation beds is permitted at any time. Watering of livestock is permitted at any time.
- Serve and refill water in restaurants, bars, and other food service establishments only upon request.
- Offer guests in hotels, motels, and other commercial lodging establishments the option of not laundering towels and linens daily.
- Repair all water leaks within three (3) days of notification by Olivenhain Municipal Water District unless other arrangements are made with the General Manager.
- Use recycled or non-potable water for construction purposes when available and feasible.[63]

Carlsbad Desalination Plant

The Claude "Bud" Lewis Carlsbad Desalination Plant is the nation's largest, most technologically advanced and energy-efficient seawater desalination plant. Each day, the plant delivers nearly 50 million gallons (56,000 acre-feet per year) of fresh, desalinated water to San Diego County – enough to serve approximately 400,000 people and account for about one-third of all water generated in the County.[64]

[63] Olivenhain Municipal Water District. 2022. Water Conservation Practices. https://www.olivenhain.com/customer-services/drought/water-use-restrictions/. Accessed July 13, 2022.
[64] https://www.carlsbaddesal.com. Accessed April 13, 2022.

San Diego County Water Authority 2020 Water Shortage Contingency Plan (2021)

In 2017, SDCWA adopted its Water Shortage Contingency Plan to effectively manage water resources when the countywide water supply is under pressure. Though SDCWA has developed a diverse water supply portfolio, supply is still threatened by climate change and drought. The plan provides background on historical drought events and provides lessons learned from those events to maintain a sustainable water supply. The plan contains a series of steps to pursue during a water shortage to minimize impacts on the region's quality of life and economy.[65] On October 28, 2021, the SDCWA Water activated the Water Shortage Contingency Plan urging regional users to increase voluntary water conservation efforts during the current drought.[66] As of May 24, 2022, new statewide regulations prohibit watering decorative grass in common areas of subdivisions and homeowners associations, as well as on commercial, industrial, and institutional properties.[67]

San Diego County Water Authority 2020 Urban Water Management Plan

Under the Urban Water Management Planning Act (Water Code Sections 10610 through 10656), SDCWA developed the 2020 Urban Water Management Plan to ensure a reliable water supply for the region. The report includes annual water supply reports, which include documentation of local and imported water supplies. The plan's overall objective was to develop a mix of drought-resilience water resources available to the region to avoid periods of water shortages. The plan also discusses the agency's role in reducing GHG emissions and climate change and its research efforts on water systems' vulnerability to climate change impacts. Under the Urban Water Management Planning Act, an urban water supplier is required to submit an updated plan every five years.[68]

Water Smart San Diego (SDCWA)

The WaterSmart Landscape Makeover Program teaches you how to create a WaterSmart landscape. The WaterSmart Contractor Incentive Program targets qualified landscape contractors and large, self-managed landscape sites. The program's goal is to improve water-use efficiency by incentivizing the upgrade of irrigation devices.[69]

3.2.2.3 WILDFIRE + SMOKE

Warmer average temperatures and drier environments create conditions that lead to extreme, high-severity wildfires. These conditions increasingly dry out vegetation and lengthen the wildfire season, which raises wildfire risks. Additionally, more frequent and intense droughts put stress on trees and make them more susceptible to pest infestations. This, in turn, can lead to more diseased, dying, and dead trees, which can exacerbate the severity of wildfires by providing more combustible fuels.

Not only do high-severity wildfires take lives and destroy homes, businesses, and community infrastructure, but they also negatively impact fish and wildlife habitats. Moreover, intense wildfires can also impair air quality throughout the state. In recent years, smoke from wildfires has grown substantially and has been a major contributor to air pollution in the western United States—making up roughly half of small particulate matter, compared to less than 20 percent a decade ago. The degree to which climate change will impact

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[65] San Diego County Water Authority. 2021. 2020 Water Shortage Contingency Plan.
[66] San Diego County Water Authority. https://www.sdcwa.org/water-authority-activates-water-shortage-contingency-plan. Accessed April 13, 2022.
[67] San Diego County Water Authority. 2022. Summer of Water Savings, State Mandates. June 21, 2022.
[68] San Diego County Water Authority. 2021. 2020 Urban Water Management Plan.
[69] San Diego County Water Authority. 2022. WaterSmart. https://www.watersmartsd.org. Accessed April 13, 2022.

particulate emissions in the future is subject to uncertainty, but researchers have estimated that particulate matter in fire-prone areas could roughly double by the end of the century.

According to the state's Fourth Climate Change Assessment, by 2100, the frequency of extreme wildfires burning over 25,000 acres could increase by nearly 50 percent. As with other climate hazards, the state is already beginning to experience an increase in severe wildfires. Most of California's largest and most destructive wildfires have occurred in recent decades. This pattern has been particularly notable in the last few years, which have seen some of the worst wildfires in the state's recorded history. Five of the twenty most destructive wildfires in the state's history occurred in 2020 alone, with an additional two in 2021. [70]

The City's landscape consists of rugged coastal terrain and includes one low-lying coastal ridge. Several open space areas within the City are characterized by shrubs and native trees. During the dry months, the wildfire risk in these open, vegetated areas can increase when exacerbated by occasional Santa Ana winds and elevated temperatures. Additionally, extreme weather conditions, such as high temperature, low humidity, and/or winds of extraordinary force, may cause an ordinary, localized fire to expand into a more intense and difficult to control wildfire. Currently, many homes within Encinitas are in the urban-wildland interface (UWI) [71], which is characterized by zones of transition between wildland and developed areas and often include heavy fuel loads that increase wildfire risk (See **Table 3-8: Urban-Wildland Interface Threatened Populations**). These areas within Encinitas include neighborhoods near Saxony Canyon, South El Camino Real/Crest Drive, and Olivenhain. [72]

Historical Wildfire Events

- 1996 – Harmony Grove wildfire in Encinitas resulted in the loss of three homes and the evacuation and sheltering of hundreds of Encinitas residents.

Note: other fires like the 2007 Witch Fire have come close to the City limits but not entered the City.

VULNERABILITY TO WILDFIRE

Climate change will result in changes in precipitation patterns, increased temperature, and drought conditions. Wetter months may lead to increased vegetative growth, while following periods of drought will allow the vegetative growth to dry up, creating greater fuel for fires. Climate change will also worsen existing severe wind events, which fuel the spread and intensity of wildfires. Santa Ana wind events blow in an offshore direction in parts of Southern California. They are caused by the formation of large high-pressure systems over eastern California, Nevada, and Utah, producing strong and extremely dry winds. Santa Ana winds have caused some of the region's most damaging wildfires and account for some of the worst extreme heat events. While future wind events are predicted to decrease, the intensity of a severe wind event over a shorter amount of time is predicted to increase. [73]

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[70] State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. https://lao.ca.gov/Publications/Report/4575. Accessed April 11, 2022.
[71] Wildland Urban Interface (WUI): The geographical intersection of two disparate systems, wildland and structures. At this interface, structures and vegetation are close enough that a wildland fire could spread to structures or fire could spread from structures to ignite vegetation. Extracted from the California Department Of Forestry And Fire Protection Fire And Resource Assessment Program, California's Forest and Rangelands: 2010 Assessment.
[72] City of Encinitas, Climate Action Plan. 2020.
[73] California Natural Resources agency, Governor's Office of Planning and Research, and California Energy Commission. 2019. California's Fourth Climate Change Assessment; San Diego Region Report. Available:

Exposure

The potential for wildland fires represents a hazard where development is adjacent to open space or within proximity to wildland fuels. Steep hillsides and varied topography within portions of the City also contribute to the risk of wildland fires. The California Department of Forestry and Fire Protection (CAL FIRE) identifies Very High Fire Hazard Severity Zones (VHFHSZ) in the City that are included in the Local Responsibility Area (LRA) (See **Figure 3-5: Fire Hazard Severity Zones**). The map identifies two key areas in the City included in the VHFHSZ. Due to the topography and vegetation of these locations, surrounding properties are at increased risk of wildfire and associated hazards. Recent wildfire events in Encinitas include the Harmony Grove Fire in 1996, which resulted in the loss of three homes and the evacuation and sheltering of hundreds of residents.[74] The area of the Harmony Grove Fire is illustrated as a part of the Historic Fire Burn Areas.

The geographic extent of this hazard includes the following areas of the City: 1) Saxony Canyon, 2) South El Camino Real/Crest Drive, and 3) Olivenhain. Properties in these and other smaller areas are susceptible to wildfire because they are situated near open spaces and canyons containing heavy fuel loads. Reoccurring periods of low precipitation have increased the risk of wildfires in the region. A greater percentage of the population is potentially exposed to wildfires, and potential losses from this hazard are comparatively larger than those associated with flooding or coastal bluff failures. Recent wildfire events in Encinitas include the Harmony Grove Fire in 1996, which resulted in the loss of three homes and the evacuation and sheltering of hundreds of residents.[75]

The California Department of Forestry and Fire Protection's (CAL FIRE) Fire and Resource Assessment Program assesses the condition of California's forests and rangelands and maps fire hazards within State Responsibility Areas based on factors such as vegetative fuels, terrain, and weather. California's seasonally dry Mediterranean Climate lends itself to wildfires, and to better prepare, CAL FIRE is required to classify the severity of fire hazards in areas of California. The maps categorize lands into moderate, high, and very high Fire Hazard Severity Zones (FHSZ). FHSZ maps consider the likelihood that an area will be burned over a 30- to 50-year period and do not consider modifications from fuel reduction efforts.[76] As shown in **Figure 3-5: Fire Hazard Severity Zones**, 6.7 square miles, or approximately 35 percent, of the City is within a very high FHSZ. Wildfires also result in secondary impacts: a major consequence of wildfires is post-fire flooding and debris flow. The risk of floods and debris flows (or mudslide) after fires increases due to vegetation loss and soil exposure. These flows are a risk to life because they can occur with little warning and exert great force on objects in their path. Health threats from debris flows include:

- Rapidly moving water and debris that can lead to trauma;
- Broken electrical, water, gas, and sewage lines that can result in injury or illness; and
- Disrupted roadways and railways that can endanger motorists and disrupt transport and access to health care.[77]
- Mud is likely contaminated with pollutants. As described in reference to the Santa Barbara County mudslide in January 2018: "That mud could contain everything from sewage, to oil and gas from ruptured lines, as well as pesticides, ash, maybe chemicals from inside houses," said Chris Bryant,

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https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-009_SanDiego_ADA.pdf. Accessed April 12, 2022.

[74] City of Encinitas, Climate Action Plan. 2020.

[75] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

[76] California Office of the State Fire Marshall. https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildfire-preparedness/fire-hazard-severity-zones/. Accessed March 28, 2022.

[77] Centers for Disease Control and Prevention. 2022. Landslides and Mudslides. https://www.cdc.gov/disasters/landslides.html. Accessed July 14, 2022.

a regulatory consultant with Bergeson and Campbell. A Jan. 17, 2018 advisory from the Santa Barbara County Department of Public Health said: "Unknown amounts of potentially hazardous chemicals and untreated sewage were swept into the mudslide debris that flowed through impacted areas." [78]

Table 3-5: Critical Facilities and Facilities of Concern (Fire Hazard Severity Zone)

Category	Number of Facilities	
	Critical	Concern
City Facilities (Fire, Sheriff)	0	-
Community & Senior Center	0	-
Library	-	0
Water/Sewer Facilities	1	-
Hospital	0	-
Total	0	0

Source: City of Encinitas 2022

One critical facility was identified by the City resides within the VHFHSZ: The San Elijo Wastewater Treatment Facility at 2695 Manchester Avenue. Four elder care facilities are located in the VHFHSZ:

- Belmont Village Cardiff 3535 Manchester Ave.
- Avocado Greens, 1159 Saxony Road
- Westmont of Encinitas, 3535 Manchester Ave
- Compassionate Elder Care and Encinitas Retirement Gardens II, 803 Hollyridge Drive

As the frequency, severity, and impacts of wildfire are sensitive to climate change as well as other factors, including development patterns, temperature increases, wind patterns, precipitation change, and pest infestations, it is difficult to project exactly where and how fires will burn. Instead, climate models estimate an increased risk of wildfires. The Keetch-Byram Drought Index (KBDI) represents a simplified proxy for favorability of occurrence and spread of wildfire but is not itself a predictor of fire. As shown in **Table 3-6: San Diego County KBDI > 600 (days)**, San Diego County's wildfire risk is projected to double by the end of the century compared with the historical baseline. This will lead to an increased risk for areas in Encinitas susceptible to wildfire and corresponding smoke.

Table 3-6: San Diego County KBDI > 600 (days)

KBDI > 600 (days)	Historic KBDI > 600 (days)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	77	126	136	133	169

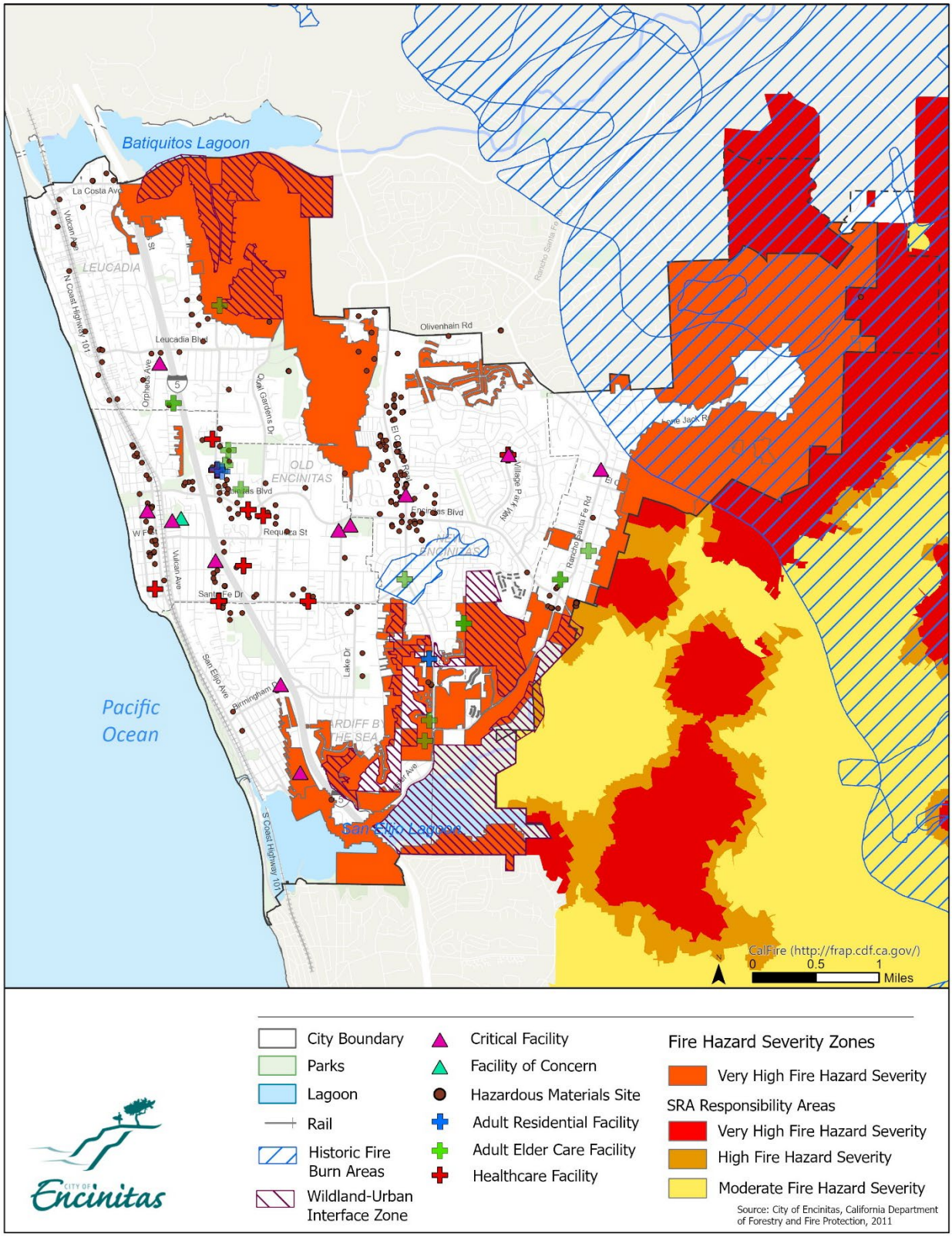
Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Encinitas: Wildfire KBDI. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

Sensitivity: Physical

Beyond direct damage to physical property and harmful effects on public safety, wildfires also result in secondary impacts: a major consequence of wildfires is post-fire flooding and debris flow. After fires, the

[78] Allington, Adam. 2018. Toxic Pollutants in California Mudslide Present Cleanup Challenges. Bloomberg Law. https://news.bloomberglaw.com/environment-and-energy/toxic-pollutants-in-california-mudslide-present-cleanup-challenges. January 18. Accessed July 14, 2022.

Figure 3-5: Fire Hazard Severity Zones



risk of floods and debris flows increases due to vegetation loss and soil exposure. These flows are a risk to life because they can occur with little warning and exert great force on objects in their path. Additionally, wildfire can cause direct and indirect damage to electrical infrastructure. Direct exposure to fire can sever transmission lines, and heat and smoke can affect transmission capacity. Other impacts of climate change also threaten electricity infrastructure, including wildfires that can destroy poles and towers carrying transmission lines.[79]

Furthermore, because of historical forest management trends over the past century, increased temperatures, and more frequent drought, California wildfires are characteristically hotter and more intense as compared to naturally occurring fire regimes. As such, soil structure and moisture retention are damaged, leading to increased susceptibility to erosion or landscapes. If Encinitas' coastal foothills become covered with dry, overgrown vegetation because of drought conditions, extreme heat events and high winds can increase the threat of wildfires.

Wildfire could damage roads in several ways. Unsafe conditions and damage could lead to road closures. Typical asphalt mixtures could ignite or melt/excessively soften. Debris from fires and subsequent landslides could block roads.[80,81] Most major roads have sidewalks that create a small defensible space as well as the development of the surrounding areas.

Wildfires could alter hydrology by changing vegetation, increasing runoff, and resulting in more sediment that could block drainage and damage structures.[82] This impact would be caused by upstream factors; wildfires are unlikely to directly burn and/or damage outfalls themselves due to construction materials and placement near bodies of water.

Conservation areas and open spaces in the City of Encinitas provide crucial ecosystem services such as clean air and water and climate regulation. If conservation areas are damaged, endangered species could be at increased risk of species survival. If habitats of sensitive species are subject to frequent disturbance or destruction, resources may be needed to conserve these species. In addition, there may be more insects, pests, or invasive species in the event of damage.

Community parks are used for recreation, exercise, as gathering spaces, and sites of natural, historical, tribal cultural, and archaeological resources. Loss of or damage to community parks would interfere with their ability to serve these functions.

Sensitivity: Social

Wildfires are a major public health concern as they can cause immediate health impacts through burns, injuries, heat stress, and direct smoke inhalation. However, a wildfire can influence the health outcomes of an area larger than the burn area because the associated smoke can travel long distances and worsen the

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[79] Davis, M., and S. Clemmer. 2014. Power failure: How climate change puts our electricity at risk—and what we can do. Cambridge, MA: Union of Concerned Scientists. https://www.ucsusa.org/sites/default/files/2019-10/Power-Failure-How-Climate-Change-Puts-Our-Electricity-at-Risk-and-What-We-Can-Do.pdf. Accessed April 11, 2022.

[80] Carvel, R., & Torero, J. (2006). The Contribution of Asphalt Road Surfaces to Fire Risk in Tunnel Fires: Preliminary Findings. Proceedings of the International Conference on Risk and Fire Engineering for Tunnels, Stations, and Linked Underground Spaces (pp. 83-87). Hong Kong: Tunnel Management International.

[81] Cannon, S., & DeGraff, J. (2009). The Increasing Wildfire and Post-Fire Debris-Flow Threat in Western USA, and Implications for Consequences of Climate Change. In K. Sassa, & P. Canuti, Landslides - Disaster Risk Reduction (pp. 177-190). Verlag Berlin Heidelberg: Springer.

[82] U.S. DOT. 2018. Transportation Climate Change Sensitivity Matrix. U.S. Department of Transportation. Retrieved from https://toolkit.climate.gov/tool/transportation-climate-change-sensitivity-matrix

air quality for extended periods. Wildfires can be a significant contributor to air pollution in both urban and rural areas and have the potential to significantly impact public health through particulates and volatile organic compounds in smoke plumes. Wildfires are a major source of particulate matter, which is an air pollutant that increases one's risk for respiratory illnesses, cardiovascular disease, negative birth outcomes, and premature death.[83] Wildfire smoke contains numerous primary and secondary pollutants, including particulates, polycyclic aromatic hydrocarbons, carbon monoxide, aldehydes, organic compounds, gases, and inorganic materials with toxicological hazard potentials.[84] Wildfire smoke also increases exposure to ground-level ozone and toxic chemicals (e.g., pesticides, plastics, and paints) released from burned buildings and other human-made materials. Individuals sheltering in place are also at risk of exposure to hazardous air quality because wildfire smoke penetrates homes, particularly older homes.[85] Beyond these immediate health impacts, the stress, displacement, and loss of home and community from wildfires can cause significant mental health impacts, such as anxiety, depression, and post-traumatic stress disorder.[86]

During hazard events such as wildfires, flooding, or extreme storms, the elderly and other vulnerable populations such as persons with disabilities may require additional assistance to adequately respond. These are unique challenges for Encinitas as 37.5 percent of households in the Very HIgh Fire Hazard Severity Zone have at least one individual age 65 or older. Additionally, 18.3 percent of households have at least one person living with a disability. Challenges that these populations face include the potential inability to access emergency supplies, evacuate, or receive and understand emergency information. The effects of climate change hazards can result in infrastructure disruptions, including power outages. Such events could result in additional health hazards for the elderly or persons with disabilities who rely on power to sustain medical equipment/assistive technology use.

Table 3-7: Very High Fire Hazard Severity Zone Threatened	VHFHSZ	Encinitas
Total Population	10,245	62,007
Percent of residents that are children (less than 10 years)	9.5%	11.0%
Percent of households that have people 65+ years	36.2%	34.1%
Percentage of households with at least one person living with a disability	18.3%	19.1%[1]
Median age	43.9	43
Total households	4,055	23,893
Median household income	$151,132	$120,488
Percent of rental households	37.5%	36.2%

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

A total of 1,733 Encinitas residents live within the wildland-urban interface (**Table 3-8: Wildland-Urban Interface Threatened Populations**). The geographic extent of this hazard includes the following areas of the City, for the most part: 1) Saxony Canyon, 2) South El Camino Real/Crest Drive, and 3) Olivenhain. Properties

[83] Bell, J.E., S.C. Herring, L. Jantarasami, C. Adrianopoli, K. Benedict, K. Conlon, V. Escobar, J. Hess, J. Luvall, C.P. Garcia-Pando, D. Quattrochi, J. Runkle, and C.J. Schreck, III, 2016: Ch. 4: Impacts of Extreme Events on Human Health. The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment. U.S. Global Change Research Program, Washington, DC, 99–128.

[84] Künzli, N. et al. 2006. Health effects of the 2003 Southern California wildfires on children. Am J Respir Crit Care Med. 174:1221-8.

[85] Rudolph, L., Harrison, C., Buckley, L. & North, S. (2018). Climate Change, Health, and Equity: A Guide for Local Health Departments. Oakland, CA and Washington D.C., Public Health Institute and American Public Health Association.

[86] Hanigan, Ivan C., Colin D. Butler, Philip N. Kokic, and Michael F. Hutchinson. 2012. "Suicide and Drought in New South Wales, Australia, 1970–2007." Proceedings of the National Academy of Sciences of the United States of America 109 (35): 13950–55.

in these and other smaller areas are susceptible to wildfire because they are situated near open spaces and canyons containing heavy fuel loads. Reoccurring periods of low precipitation have increased the risk of wildfires in the region. The WUI zone in the northern portion of the City is fully within a VHFHSZ, whereas the WUI in the southern part of the City is intermixed within the VHFHZ zone. Like the FHSZ, 24.5 percent of households have at least one person living with a disability. However, the areas are more affluent and have one-third of the number of households that have people aged 65 years or more. This should reduce the sensitivity to wildfire (and smoke) and benefit the adaptive capacity of these households. [87]

Table 3-8: Wildland-Urban

	WUI[1]	Encinitas
Total Population	1,733	62,007
Percent of residents that are	10.0%	11.0%
Percent of households that have	15.9%	34.1%
Percentage of households with at	24.5%	19.1%[1]
Median age	47.6	43
Total households	640	23,893
Median household income	$153,306	$120,488
Percent of rental households	22.7%	36.2%
Percent of household income	6.2%	7.2%

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

Adaptive Capacity

The City has addressed wildfire in planning documents such as the Climate Action Plan, Hazard Mitigation Plan, and the Urban Forest Management Plan. The City also operates programs that respond to wildfire events for displaced residents. Finally, the City also has regulations in place that are beneficial during wildfires by limiting further potential public health impacts. The plans and programs for the City and supporting agencies are described below.

City of Encinitas Climate Action Plan (2020)

Like many communities in the region, the City will likely experience increased wildfire risk in the future. To prepare for increased wildfire risk, the City has adopted strategies focused on key areas within the City that are most vulnerable to wildfire risk, such as residences and businesses that are in the UWI within the City. The City will implement the following strategies to address increased wildfire risk.

- Coordinate with relevant agencies, including CalOES, CAL FIRE, and the Encinitas Fire and Marine Safety Department, to map and identify current and future land uses, neighborhoods, and infrastructure that are at an elevated risk of experiencing wildfire impacts.
- Continue to update the MJHMP every five years.
- Update the Safety Element of the City's General Plan consistent with the OPR General Plan Guidelines, which requires adopted safety elements to consider climate change and climate adaptation strategies pursuant to SB 379.
- Improve coordination for emergency services related to wildfire and other related events in the City.
- Consider new development standards for City residents and businesses within the WUI.

[87] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

San Diego County Multi-jurisdictional Hazard Mitigation Plan (2017)

The 2017 MJHMP included objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 5 of the 2017 MJHMP Chapter on Encinitas intends to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to wildfires/structural fires." The goal includes four corresponding objectives and 26 actions to help the City prepare for the impacts of wildfires (and structural fires). Objectives and actions focus on planning, protecting vulnerable assets susceptible to wildfire/structural fires, agency coordination, and public education.[88]

City of Encinitas Municipal Code

Helping to reduce the spread of wildfire, the City specifies development setback requirements in the Zoning Ordinance (Encinitas Municipal Code Title 30).

Defensible Space (2008)

In 2008, the City of Encinitas Fire Department received a Federal Emergency Management Administration (FEMA) Fire Prevention and Safety Grant to conduct a public education program to educate Encinitas residents on defensible spaces, Firewise gardening techniques, and how best to protect homeowners from wildfires.

CALFIRE (2013)

In 2013, the City worked with CAL FIRE, to develop the City's Fire Hazard Severity Zone Map. The map identifies the VHFHSZ within the City, locating regions in the City at increased risk of wildfire risk and related hazards.

Emergency Shelters

Hazardous climate events, such as extreme heat events or flooding, may potentially displace Encinitas residents or the already homeless. Those displaced will require temporary shelter during hazardous conditions and severe weather events with supplies that can increase the adaptive capacity of individuals experiencing homelessness.

In February 2019, the City of Encinitas adopted Ordinance 2019-01, which permitted emergency shelters within the Light Industrial (LI) and Business Park (BP) zones as required by California Government Code Section 65583(a)(4) (A- D). In selecting an appropriate location for emergency shelters, access to public transit was an important consideration, as individuals and households experiencing homelessness do not have reliable means of transportation. The LI and BP zones are well served by public transportation and regional connections providing access to jobs and services.

Cool Zones

The Community Resource Center, Encinitas Public Library, Cardiff-by-the-Sea Library, and the Community Senior Center are San Diego County designated Cool Zone facilities intended to provide areas for vulnerable populations to find refuge from hot weather.[89]

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[88] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.
[89] San Diego County Health and Human Services Agency. 2022. Cool Zones. https://www.sandiegocounty.gov/hhsa/programs/ais/cool_zones/. Accessed July 14, 2022.

The City of Encinitas has partnerships with other service providers. The City provides Community Development Block Grant (CDBG) program funds to homeless service providers for homeless prevention and regional shelter efforts. Other North County facilities and services for those experiencing homelessness include:

- Mental Health Systems (Oceanside— 12.2 miles)
- Interfaith Community Services (Vista — 16.4 miles)
- La Posada Shelter (Carlsbad — 7.8 miles)
- Women's Resource Center (Oceanside — 12.2 miles)
- Operation Hope (Vista — 15.6 miles)
- Haven House (Escondido— 16.4 miles)
- Interfaith Community Services (16.4 miles)
- North County Lifeline (Oceanside 13.1)
- Oceanside Transit Center (Oceanside — 13.1 miles)[90]

3.3.2.4 FLOODING

Climate models predict that California will experience less frequent but more intense storm patterns in the coming decades, including the state's precipitation more frequently falling as rain rather than snow compared to historical trends. Additionally, the state's streams and rivers will swell more in some years from earlier and faster spring snowmelt caused by higher temperatures. Scientists suggest the combination of these factors could lead to a 50 percent increase in runoff in future years, challenging the capacity of the state's existing reservoirs, canals, levees, and other flood control systems and increasing the risk of inland flooding. Floods cause significant risk to human life and damage roads, buildings, and other infrastructure.[91]

ONSHORE FLOODING

Increases in temperature and precipitation can lead to extreme precipitation events and sea-level rise, leading to flooding in Encinitas. In the context of climate change for Encinitas, this analysis categorizes flood types according to climate effect: Onshore flooding caused by precipitation-driven events and coastal flooding. The following describes the types of floods within each category.

Onshore Flooding from Precipitation-Driven Events

- **Inland flooding** occurs when moderate precipitation accumulates over several days, intense precipitation falls over a brief period, or a river overflow because of an ice or debris jam or dam or levee failure.
- A **flash flood** is caused by heavy or excessive rainfall in a brief period, generally less than six hours. Flash floods are usually characterized by raging torrents after heavy rains that rip through riverbeds, urban streets, or mountain canyons. They can occur within minutes or a few hours of excessive rainfall.

Coastal Flooding

- A **coastal flood**, or chronic inundation of land areas along the coast, is caused by higher-than-average high tide and worsened by heavy rainfall and onshore winds (i.e., wind blowing landward from the ocean).

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[90] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029.

[91] State of California, Legislative Analyst's Office. 2022. Budget and Policy Post. Climate Change Impacts Across California Crosscutting Issues. April 5, 2022. https://lao.ca.gov/Publications/Report/4575. Accessed April 11, 2022.

- **Storm surge** is an abnormal rise in water level in coastal areas, over and above the regular astronomical tide, caused by forces generated by a severe storm's wind, waves, and low atmospheric pressure.[92]

The following analyses describe onshore flooding and coastal flooding vulnerabilities resulting from projected climate change for the City of Encinitas.

Onshore Flooding from Precipitation Events

Variability in the climate is likely to result in changes in the frequency, intensity, and duration of precipitation events causing heavy rainfall, thunderstorms, and hail. Like other California regions, the high year-to-year variability of precipitation in Encinitas is severely affected by extreme precipitation events (days having precipitation at or exceeding the 95th percentile), which accounts for 80 percent of the year-to-year variability.[93] Most of the heaviest events occur during winter. While days with measurable precipitation become less frequent in Southern California, extreme precipitation events are anticipated to intensify. It is predicted that the state will experience prolonged periods of drought followed by extreme precipitation (See Section 3.2.2.2: Drought).

For Encinitas, projections show only a slight change in average annual rainfall through the end of the century (**Table 3-2: Change in Annual Average Precipitation**). Globally, climate change is anticipated to lead to more variability in the intensity of rainfall events from year to year and longer transitions between droughts and deluges.[94,95] Historically, Encinitas has experienced an average of three extreme precipitation events per year. Under the medium emissions scenario, the City is still expected to experience three extreme precipitation events per year through the end of the century. Under the high emissions scenario, Encinitas is expected to experience three to four extreme precipitation events per year by mid-century and four extreme precipitation events per year by the late century.[96]

The primary concern for precipitation-driven hazards is flooding. Areas of Encinitas already experiencing flooding when there are heavy rainfall events could find that flooding increases in the future. However, the forecasted changes in Maximum 1-Day Precipitation are not anticipated to be substantially different from historical records (see **Table 3-9. Change in Maximum 1-Day Precipitation**). Therefore, impacts from flooding caused by projected climate change should not be dramatically different than what the community currently experiences.

Table 3-9. Change in Maximum 1-Day Precipitation

Maximum 1-Day Precipitation (Inches)	Historic Maximum 1-Day Precipitation (1961 – 1990)	Medium Emissions (RCP 4.5)		High Emissions (RCP 8.5)	
		Mid-Century	End-Century	Mid-Century	End-Century
	1.168 inches	1.169 inches	1.189 inches	1.208 inches	1.248 inches

[92] NOAA National Severe Storms Laboratory. *Severe Weather 101.* https://www.nssl.noaa.gov/education/svrwx101/floods/types. Accessed April 6, 2022.

[93] Jennings, M.K., D. Cayan, J. Kalansky, A.D. Pairis, D.M. Lawson, A.D. Syphard, U. Abeysekera, R.E.S. Clemesha, A. Gershunov, K. Guirguis, J.M. Randall, E.D. Stein, S. Vanderplank. (San Diego State University). 2018. San Diego County Ecosystems: Ecological Impacts of Climate Change on A Biodiversity Hotspot. California's Fourth Climate Change Assessment, California Energy Commission. Publication number: CCCA4- EXT-2018-010.

[94] Higbee, M. C. (2014). Report from San Diego County Multi-Jurisdictional Hazard Mitigation Plan Update Training Workshop #1: Climate Change and Hazards in San Diego.

[95] Swain, D. L. (2018). Increasing precipitation volatility in twenty-first-century California. Nature Climate Change.

[96] California Energy Commission. Cal-Adapt Extreme Precipitation Events Tool. Available: https://cal-adapt.org/tools/extremeprecipitation/. Accessed April 6, 2022.

Source: California Energy Commission. CalAdapt. Local Climate Change Snapshot for Encinitas: Maximum 1-Day Precipitation. https://cal-adapt.org/tools/local-climate-change-snapshot. Accessed March 28, 2022.

Historical Onshore Flooding Events

- November 17-18, 1986. Early season storm brought 1.16" to San Diego and 1.03" in Oceanside, more rain that falls in than a typical November. The storm caused numerous traffic accidents and multiple power outages. Street flooding occurred in Encinitas.
- February 18-20, 1993. Heavy rain: 2-5" in coastal areas. Urban and river flooding occurred across the region. Flooding occurred from Oceanside to Encinitas.[97]
- 1997. Heavy winter storms forced the closure of Coast Highway 101.
- March 1, 2010. Storm resulted in limited access along Coast Highway 101 due to flooding and undermining in one section that prompted emergency repairs to pump concrete slurry beneath the existing roadway and pulling existing riprap toward the road.
- 2015-2016. El Nino-related winter storms prompt temporary placement of cobble along Coast Highway 101.
- April 10, 2020. Encinitas recorded nearly 5 inches of rain in 24 hours on Friday, April 10, as a low-pressure system parked over Southern California. The five-day total was 7.39 inches in Encinitas. The city of Encinitas closed Lone Jack Road, from Crystal Ridge Road through to the east of Stratford Knoll, in Olivenhain on Friday because of heavy flooding.[98]

Exposure

Flood zones are geographic areas that the Federal Emergency Management Act (FEMA) has defined according to varying levels of flood risk. These zones are depicted on a community's Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map. Each zone reflects the severity or type of flooding in the area. Portions of the City are located within a FEMA 100-year zone and floodways (illustrated in **Figure 3-6: Flood Hazard Zones**). These two designations coincide with the City's Floodplain Overlay Zone boundary. The low-lying areas along the floodplains of Cottonwood Creek, Encinitas Creek, Escondido Creek, and their tributaries can experience flooding during severe rain seasons.[99]

In Encinitas, the geographic extent of flooding hazard is limited to 1) Encinitas coastline, particularly "Restaurant Row" in Cardiff (south of San Elijo State Beach Campgrounds); 2) Escondido, Encinitas, and Cottonwood Creeks; and 3) low-lying areas of Leucadia and Old Encinitas. The City has experienced property-related losses resulting from localized flooding in Leucadia and coastal flooding in Cardiff, but not loss of life. Winter storms in 1997, 2005-2006, and 2010-2011 resulted in significant damages and required emergency protective measures, debris removal, and infrastructure reconstruction.

Dam Failure

Geologists estimate that a magnitude 7.5 earthquake from the Elsinore Fault 11 miles east of Lake Wohlford could result in a failure of its hydraulic fill dam. The geographic extent of this hazard is limited to the persons and properties within the inundation path surrounding Escondido Creek and San Elijo Lagoon. The dam inundation path is larger than the Escondido Creek 100-year floodway, and a greater number of persons and properties are exposed to this hazard compared to coastal bluff failures and flooding. Major arterials within the inundation path include El Camino Del Norte, Rancho Santa Fe Road, Manchester Avenue, and Coast Highway 101. The failure of Wohlford Dam (1895) and Dixon Reservoir Dam (1970) could threaten

[97] National Weather Service. 2017. A History of Significant Weather Events in Southern California.
[98] North Coast Current. 2020. Encinitas receives nearly 5 inches of rain in 24 hours Friday. April 10.
[99] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029: Appendix B.

City facilities and infrastructure (including the San Elijo Water Reclamation Facility, Cardiff and Olivenhain sewer pump stations, and the San Dieguito Water District 36" high-pressure supply line) and educational facilities (MiraCosta College) located in and adjacent to the inundation path. Although exposure to loss of property is significant, the potential for loss of life is limited because of the length of time before flood wave arrival (approximately 1 ½ hours), allowing for aggressive warning and evacuation measures to be initiated by the City.

The Olivenhain Dam (2003) is a concrete gravity dam located on a tributary of Escondido Creek, just west of Lake Hodges, holding 24,000 acre-feet. Stanley Mahr Reservoir (1981) is a small, earth-filled embankment dam located on a tributary of Encinitas Creek in San Marcos with a capacity of approximately 200-acre feet. A failure of Mahr Reservoir in Carlsbad would produce flooding along Encinitas Creek (which flows into Batiquitos Lagoon) in the northern portion of the City. Emergency Action Plans have been developed for these dams. The risk of failure of both dams is low due to their age and construction and existing surveillance and inspection measures. Figure 3-6: Flood Hazard Zones shows 100-year floodplains and floodways within the City.[100]

Coastal Bluff Failures

The geographic extent of the hazard is limited primarily to the Encinitas coastal sandstone bluffs. After the El Nino storms of 1982-1983, Encinitas beaches were stripped of vertical sand up to twenty feet deep, putting the coastal bluffs and homes in jeopardy of collapsing into the sea. Furthermore, the shoreline segments at Moonlight Beach and Cardiff-by-the-Sea are extremely vulnerable to coastal inundation from potential future sea-level rise. In 2000, unstable cliffs at Beacon's Beach in Encinitas caused a landslide that killed a woman sitting on the beach. The recreational bicycle path along the seaside of Highway 101 was undermined in 2010. In 2019 a failure near the Grandview Street public access killed three people.

No critical facilities or hazardous materials sites are in the 100-Year Flood Zone or associated Floodways. Public safety critical asset types have a near-negligible vulnerability to precipitation-driven flooding. Fire stations and police patrol and specialty vehicles have a low vulnerability to precipitation-driven flooding. These asset types have low exposure, meaning that none of them are located within the 100-year floodplain or floodway. None of the healthcare, elder care, or adult residential facilities are within the 100-year floodplain or floodway.

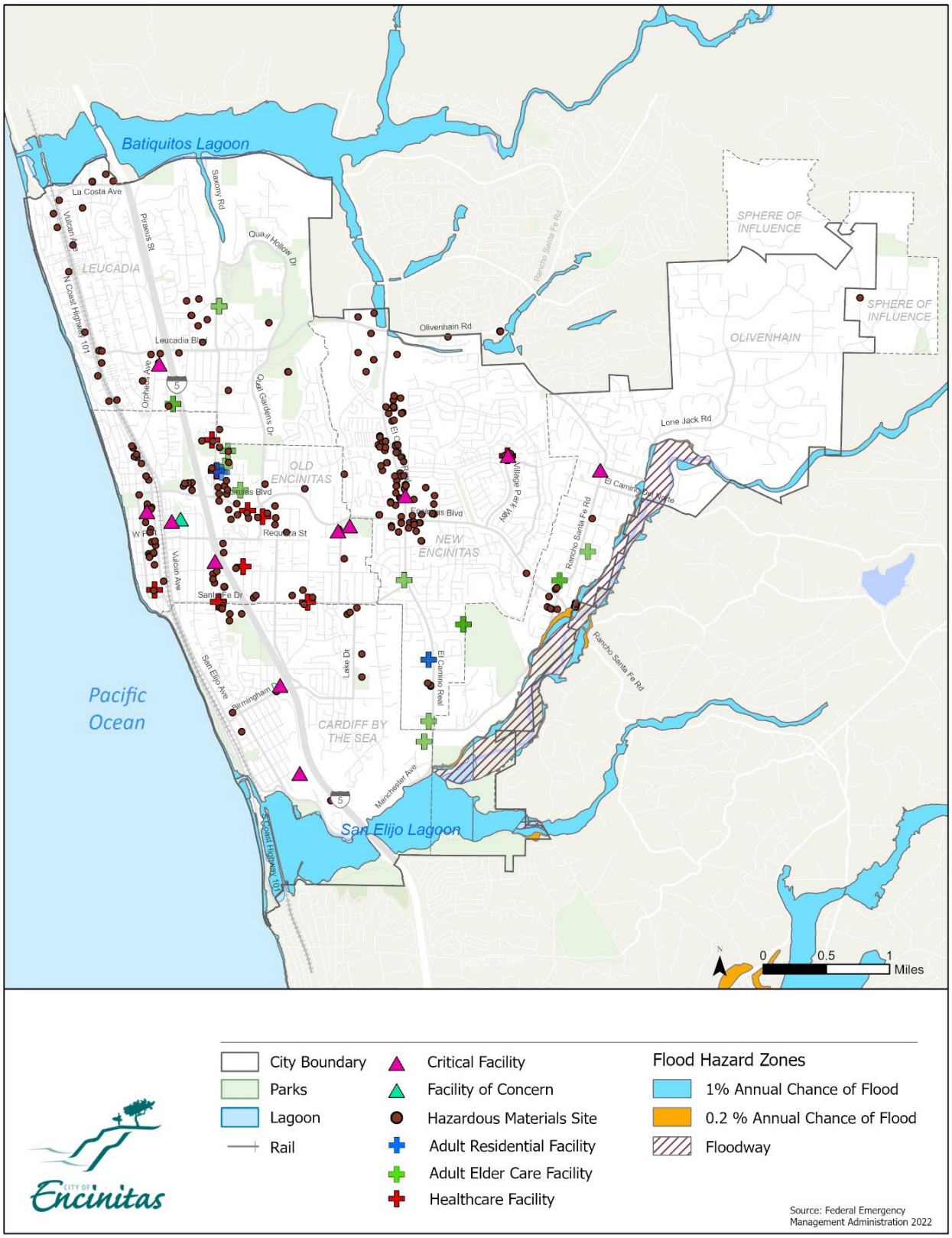
No Encinitas residents live in a FEMA flood zone. Any potential flood threat will primarily affect those residents living adjacent to a 100-year flood zone. These zones are located along drainages within the City. Flooding of this type would inundate curb cuts as well as sidewalks.

Sensitivity: Physical

Water pipes, wastewater pipes, and wastewater pump stations show low to medium vulnerability to onshore flooding and high vulnerability to coastal erosion. Flooding would not have a severe impact on underground pipes or pump stations, but erosion could compromise the functionality of the system. Higher intensity storms result in higher levels of erosion and sediment runoff into waterways, which in turn can back up/clog storm drain systems resulting in their failure. Sediment back up caused a drainage failure and subsequent flooding around Ocean Cove Dr. in 2020, so this is a recent and relevant issue.

[100] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

Figure 3-6: Flood Hazard Zones



The City has key underpasses beneath major freeways and rail lines that, if flooded, could impact circulation throughout the City. Electronic or mechanical equipment on the ground could become waterlogged and nonfunctional.

Storm events could cause erosion on trails. Periodic flooding may temporarily limit access to parks, but once floodwaters recede, the park should be usable again with limited clean-up. Leucadia Oak Parks and Encinitas Community Parks were designed to be multi-purpose as they incorporate climate adaptation features that retain upstream runoff in detention basins within the park. Under dry, non-precipitation events, these areas are recreational park features such as a volleyball court and a sports field.

Precipitation-driven flooding has the potential to impact habitats. Increased precipitation patterns could encourage the growth of invasive species. In addition, flooding in regional upland watersheds could impact water quality by bringing more nutrients and total dissolved solids into the water supply.

Sensitivity: Social

In a flood event, any people in Encinitas who walk or bike as their main form of transportation may encounter greater difficulties with their mobility if they do not have access to an alternative means of transportation. Seniors, persons with disabilities, and low-income persons are those most likely to be threatened. Flooding is the second most deadly weather-related hazard in the United States, which can be attributed mostly to drowning. Other effects can include building damage, mold, and respiratory damage.[101]

Surfing and ocean swimming are very popular activities in the City. Encinitas is an internationally known surfing hotspot and was named one of the top 20 surf towns by National Geographic in 2012.[102] Rainstorms and the subsequent runoff can introduce an influx of freshwater carrying trash, nutrient, and bacteria rich freshwater into the ocean. As stated by the San Diego County Department of Environmental Health and Quality, "Urban runoff may contain large amounts of bacteria from a variety of sources such as animal waste, soil, and decomposing vegetation. Bacteria levels can remain elevated after a rainstorm depending upon the intensity of the storm, volume of runoff and ocean conditions." Swimmers, surfers and other beach water users are typically warned to avoid going into the water at beaches and bays because recent rainfall could bring urban runoff, which can cause bacteria levels to rise significantly.[103]

Additionally, persons experiencing homelessness may be caught outside during flood conditions without any shelter. Possessions such as sleeping bags or electronic devices may be damaged or swept away by the floodwaters. Factors that make people sensitive to flooding are related to their ability to evacuate or escape the flood.

Adaptive Capacity

While there is limited physical or social vulnerability to onshore precipitation-driven flooding, the City is well prepared to adapt to future effects of climate change related to flooding. Encinitas has adopted

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[101] Hall, A., N. Berg, and K. Reich. 2018. Los Angeles Summary Report. California's Fourth Climate Change Assessment. University of California, Los Angeles. Publication number: SUM-CCCA4-2018-007.

[102] San Diego Union-Tribune. 2012. Encinitas named one of 20 best surf towns. July 26. https://www.sandiegouniontribune.com/sdut-encinitas-named-one-worlds-best-surf-towns-2012jul26-story.html. Accessed July 14, 2022.

[103] The Times of San Diego. 2022. Swimmers and Surfers Warned of High Ocean Bacteria Levels after Recent Rain. March 20. https://timesofsandiego.com/health/2022/03/20/swimmers-and-surfers-warned-of-high-ocean-bacteria-levels-after-recent-rain/. Accessed July 14, 2022.

regulations and implemented programs intended to ensure the health and safety of its residents from flooding events. These include, but are not limited to:

Floodplain Overlay Zones

Floodplain Overlay Zone regulations apply to all areas within the Special Study Overlay Zone, where site-specific analysis of the land indicates the presence of a flood channel, floodplain, or wetland. The zone also applies to all areas identified as flood channels and floodplains on maps published by the Federal Emergency Management Agency or current City and County maps designating the floodway/ floodplain areas. Any development within this zone is required to incorporate a series of improvements or modifications to ensure the ability of structures to withstand periodic flooding. The additional standards are also in place to guarantee the preservation of sensitive habitat areas.

Construction Codes

The City of Encinitas' construction codes are based upon the California Code of Regulations, Title 24, which includes the California Administrative Code, Building Code, Residential Code, Electrical Code, Mechanical Code, Plumbing Code, Energy Code, Historical Building Code, Fire Code, Existing Building Code, Green Building Standards Code, and California Referenced Standards Code. They are the minimum necessary to protect the public health, safety, and welfare of the City's residents.

COASTAL FLOODING AND INUNDATION

With six miles of coastline critical to the local economy, tourism industry, and Encinitas lifestyle, coastal hazards are a primary climate-related concern for Encinitas. Coastal hazards include coastal flooding and erosion, both of which are expected to be exacerbated by climate change. According to the closest tide gauge in La Jolla, sea levels rose 0.67 feet between 1924 and 2021.[104] The frequency of extreme coastal floods is expected to increase under all projections of sea-level rise. Rising seas boost the occurrence of severe floods (such as the 500-year flood) more than moderate floods (such as the ten-year flood) along the Pacific coast of the United States.[105] By elevating storm tide, sea-level rise makes it easier for waves to overtop natural barriers, increasing the relative frequency of flooding along the Pacific coast.

King tides in Encinitas already result in flooding along low-lying stretches of shoreline. The vulnerability considers how these conditions will change with sea-level rise in the future. The assessment evaluates tidal flooding—storm surge and sea-level rise—in terms of total water level above today's mean higher high water (MHHW) level. Using total water level recognizes the contribution of both sea-level rise and storm surge to flooding and reflects a range of scenarios.

Historical Coastal Events

- December 1-2, 1986. High tides of 7.7' at San Diego. Minor flooding (4" of seawater) along Pacific Coast Hwy.
- January 30, 1998. Very high surf, up to twenty feet, pounded the beaches of Orange and San Diego Counties. Severe beach erosion was reported, along with damage to the Ocean Beach and Seal Beach piers and thirty-two homes in San Clemente.

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[104] National Oceanic and Atmospheric Administration. (2022). Relative Sea Level Trend 9410230 La Jolla, California. NOAA Tides & Currents: https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=9410170. Accessed April 6, 2022.

[105] Buchanan, M. K. (2017). *Amplification of flood frequencies with local sea level rise and emerging flood regimes*. Environmental Research Letters, 12(6), 064009.

- March 1, 2010. Storm resulted in limited access along the South Coast Highway 101, south of restaurant row (south of Chart House) in Cardiff-by-the-Sea, due to flooding and undermining along road.
- January 11, 2013. Very high "king" tides around 7.5' hit the coast. Some beach areas became inundated with seawater in Seal Beach, La Jolla Shores, and Imperial Beach. [106]
- December 23, 2015. Storm events and higher than normal tides, caused severe coastal erosion to the shoreline along Cardiff State Beach within the Encinitas City limits. Flooding occurred in both Cardiff State Beach parking lots and into the beach fronting restaurants (Pacific Coast Grill/Chart House). Public access points were closed. Severe wave action events accompanied by high tidal push, exposed portions of South Coast Highway 101.

Coastal Flooding

According to OPC's *State of California Sea-Level Rise Guidance: 2018 Update*, there is a 0.5 percent probability that Encinitas could experience between 0.9 feet of sea-level rise by 2030, 2.0 feet by 2050, and 7.1 feet by 2100 under the high emissions, RCP 8.5 scenario. [107]

These projections were used to select corresponding localized sea-level rise modeling thresholds produced by the United States Geological Service (USGS) through their Coastal Storm Modeling System version 3.0 (CoSMoS). CoSMoS produces projections of coastal flooding and inundation that could result from sea-level rise and storms while factoring in changes in beaches and the retreat of cliffs and bluffs along the California coast. [108] The sea-level rise mapping consists of a quantitative geospatial assessment of CoSMoS projected SLR and 100-year storm surge impacts on the Encinitas coastline. CoSMoS flood maps illustrate the potential extent of inundation and/or temporary coastal flooding from a 100-year storm event resulting from projected sea-level rise for specific water elevations. As the projected water level is calculated from the mean sea level, the depth of flooding on land may be less than the projected water elevation and may also vary by location based on topography.

The OPC projections were translated to the closest data available from CoSMoS. Based on this data selection process, the following sea-level rise projections were used to estimate the exposure from daily average flooding and storm surge (100-year) flooding: 0.25 meters of sea-level rise (2030 timeframe), 0.5 meters (2050 timeframe), and 2.0 meters of sea-level rise (2100 timeframe). [109]

Daily flooding was used to estimate exposure to chronic inundation and represents the extent of flooding that would occur at high tide on average each day, assuming each sea-level rise scenario (**Figure 3-7: Chronic Inundation**). Storm surge (100-year storm) flooding was used to estimate exposure to more severe but periodic flooding and represents the extent of flooding that would occur during a 100-year (one percent annual chance) storm assuming each sea-level rise scenario in **Figure 3-8: Storm Surge Flooding**). The storm surge flooding scenario is not additive to the daily flooding scenario.

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[106] National Weather Service. 2017. A History of Significant Weather Events in Southern California.
[107] Ocean Protection Council. 2018. State of California Sea-Level Rise Guidance: 2018 Update.
[108] USGS. (n.d.). Coastal Storm Modeling System (CoSMoS). https://www.usgs.gov/centers/pcmsc/science/coastal-storm-modeling-system-cosmos?qtscience_center_objects=0#qt-science_center_objects. Accessed April 6, 2022.
[109] Sea level rise (SLR) projections from the Ocean Protection Council (OPC) were provided in feet. The United States Geological Survey's CoSMoS 3.0 model used to map the extent of flooding operates using the metric system. The OPC SLR projections (with associated timeframes) were matched to the closest value in CoSMoS for use in the analyses. As a result, the scenario elevations from CoSMoS may differ from the OPC projections.

Figure 3-7: Chronic Inundation

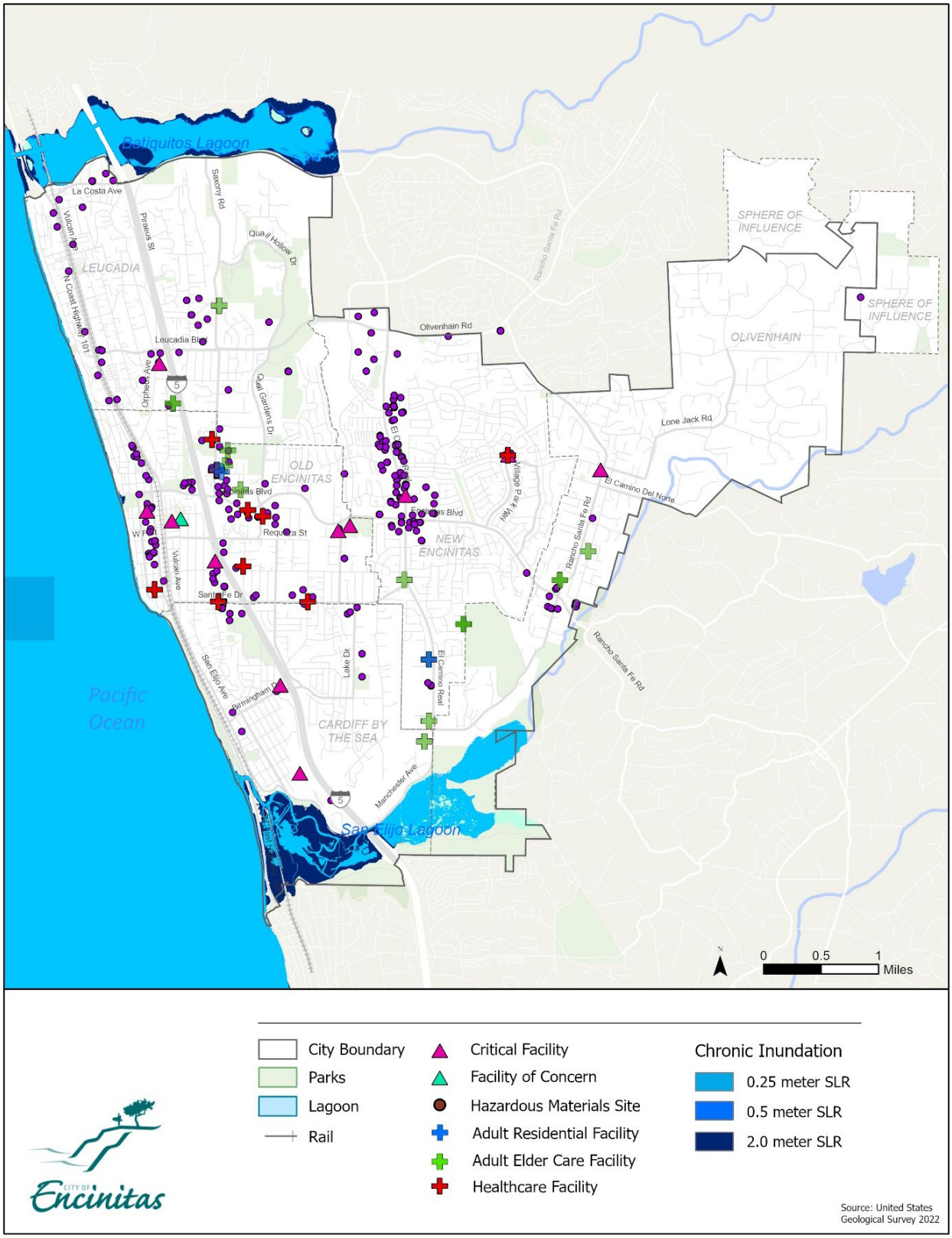
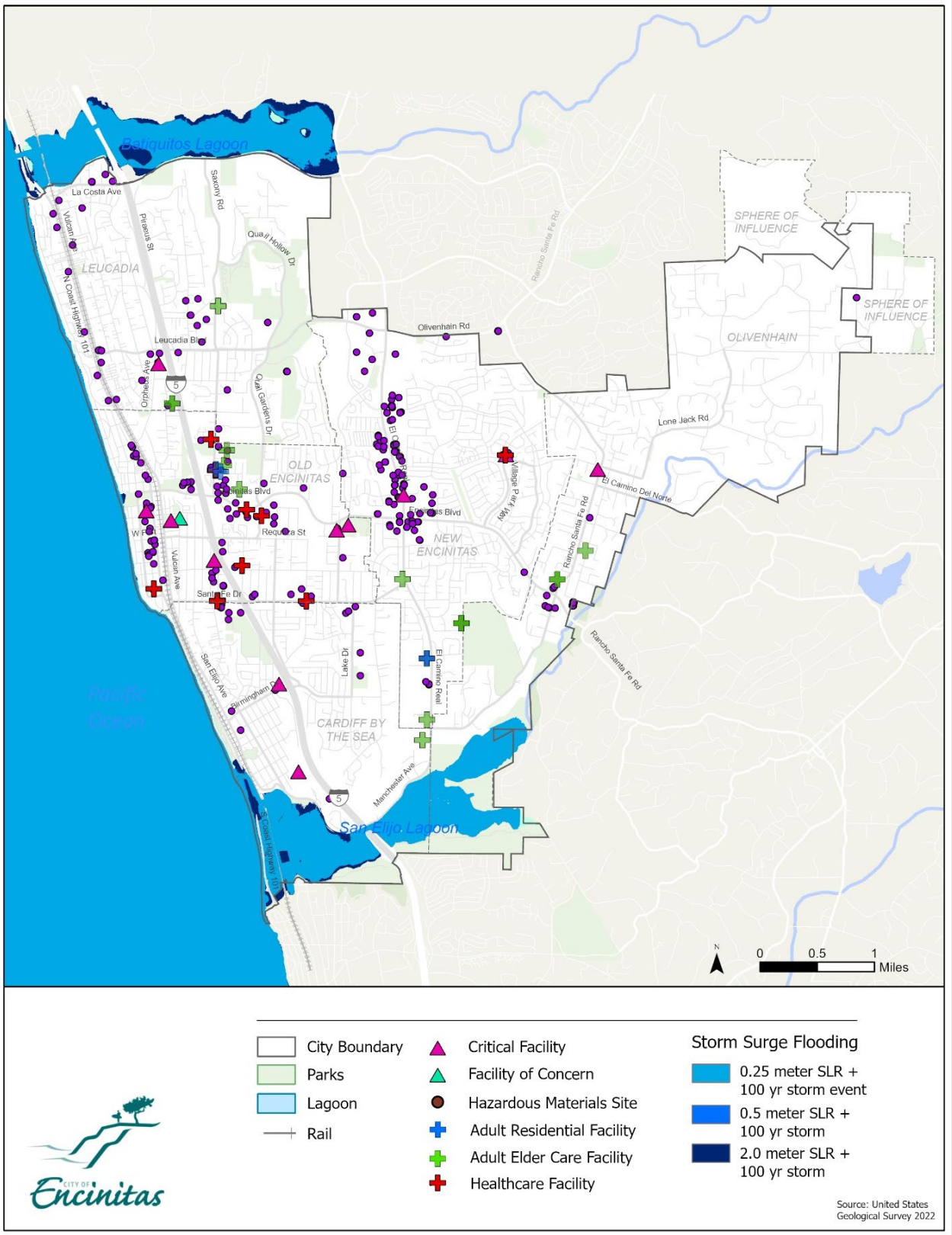


Figure 3-8: Storm Surge Flooding



Exposure

Encinitas' Climate Action Plan contains data from a 2017 assessment of potentially impacted infrastructure along the City's coastline. The 2017 sea-level rise assessment relied upon 2012 National Research Council projections for sea-level rise in the San Diego region. According to projections, sea-level is expected to rise 4-30 centimeters (2-12 inches) by 2030, 12-61 centimeters (5-24 inches) by 2050, and 42-167 centimeters (17-66 inches) by 2100, relative to the year 2000 levels. Consistent with the 2017 analysis and the 2020 CAP, this assessment utilizes a 0.5-meter increase in sea level by mid-century and a 2-meter rise in sea level by the end of the century. The City of Encinitas selected these higher-end sea-level rise scenarios consistent with a "medium-high risk-averse" approach to planning for sea-level rise resilience.[110]

Table 3-10: Encinitas Infrastructure Impacted by Sea Level Rise

Buildings Stock	Low-lying areas surrounding San Elijo Lagoon
	Erosions impacts to residential areas near Sea Cliff County Park (Swami's)
Storm Water	Stormwater systems north and west of San Elijo Lagoon and outlets on Moonlight Beach will be impacted by 2100.
	Cliff retreat has a high potential impact on the stormwater system, including inlets and outlets west of South Coast Highway 101 between San Elijo Lagoon and Sea Cliff County Park (Swami's).
Wastewater	By 2100, flooding is projected to impact Cardiff Sewer Pump Station, sewer system infrastructure surrounding San Elijo Lagoon, wastewater infrastructure at Moonlight Beach, and two lift stations in Batiquitos Lagoon.
	Higher water levels could potentially cause sewer spills into environmentally sensitive areas, such as the mouth of San Elijo Lagoon.
Drinking Water	Aboveground water distribution components, such as valves, meters, and service points north and west of San Elijo Lagoon will be exposed to impacts of flooding.
Transportation	Sections of Highway 101 near San Elijo Lagoon will experience flooding impacts by 2050 and 2100.
	Erosion is projected to impact Coast Highway 101 south of the Self-Realization Fellowship Temple and local roads along the coastal bluff, including Neptune Ave and 4th Street.
Beach and Public Access	Boneyard Beach and D Street Beach, located south of Moonlight Beach, are also projected to experience shoreline change.
	Cardiff State Beach-Seaside and Cardiff State Beach are located along the San Elijo Lagoon, which is projected to be impacted by flooding and shoreline change.

Source: City of Encinitas, ICLEI 2017

Further analysis did not identify any Critical Facilities, Facilities of Concern, or hazardous materials sites located in the chronic inundation or storm surge areas (See **Figure 3-7: Chronic Inundation and Figure 3-8: Storm Surge Flooding**). None of the healthcare, elder care, or adult residential facilities are within the chronic inundation or storm surge areas.

[110] Ocean Protection Council. 2018. State of California Sea-Level Rise Guidance: 2018 Update.

An evaluation of projected sea-level rise impacts revealed only slight differences in socio-economic impacts through the end of the century. While the effect of storm surge is larger at 2 meters, the effects of chronic inundation up to 2 meters and storm surge flooding up to 0.5 meters are the same under the three scenarios.[111] The primary reason for the similarity in impacts is 1) Encinitas properties and residents are primarily on coastal bluffs and therefore less affected by direct flooding and storm surge (and more affected by bluff erosion), and 2) the lagoons to the north and south of the City are able to accommodate much of the future flooding.

The socio-economic characteristics of the populations threatened by future sea-level rise differ from those of the general population within the City, with fewer children, fewer elderly, younger, a higher percentage of homeownership, and fewer people living below the poverty level. As a result of these characteristics, it is reasonable to assume that the population affected by future sea-level rise would not be considered vulnerable from a climate change perspective.

Table 3-11: Chronic Inundation – Threatened Populations	0.25 Meters	0.5 Meters	2 Meters	Encinitas
Total Population	448	448	472	62,829
Percent of residents that are children (less than 10 years)	6.8%	6.8%	7.0%	9.7%
Percent of households that have people 65+ years	27.1%	27.1%	27.6%	35.0%
Percentage of households with at least one person living with a disability	19.2%	19.2%	18.4%	19.1%
Median age	41.5	41.5	41.9	44.1
Total households	177	177	185	24,516
Median household income	$108,558	$108,558	$109,505	$120,888
Percent of rental households	54.2%	54.2%	52.5%	37.7%
Percent of household income below poverty level	4.5%	4.5%	4.9%	7.1%

Source: US Census Bureau, ACS 2015 – 2019, SANDAG Series 13 Regional Growth Forecast Update, ESRI 2022[1]

Table 3-12: Storm Surge Flooding Threatened Populations	0.25 Meters	0.5 Meters	2 Meters	Encinitas
Total Population	448	448	553	62,829
Percent of residents that are children (less than 10 years)	7.9%	7.9%	7.9%	9.7%
Percent of households that have people 65+ years	27.1%	27.1%	25.2%	35.0%
Percentage of households with at least one person living with a disability	19.2%	19.2%	17.3%	19.1%
Median age	41.5	41.5	43.2	44.1
Total households	177	177	326	24,516
Median household income	$108,558	$108,558	$109,666	$120,888
Percent of rental households	54.2%	54.2%	54.0%	37.7%
Percent of household income below poverty level	4.5%	4.5%	5.1%	7.1%

Source: US Census Bureau, ACS 2015 – 2019, SANDAG Series 13 Regional Growth Forecast Update, ESRI 2022[1]

Sensitivity: Physical

Critical infrastructure such as roads, rail, and the stormwater system are particularly sensitive to potential inundation. A 100-year storm event may obstruct business operations, limit public access, and/or lead to potential public safety reductions, including emergency response recovery. Transportation and stormwater

[111] Because of the presence of bluffs, the .25 meter and .5-meter scenarios for Chronic Inundation and Storm Surge impact the same group of people.

systems adjacent to flood-susceptible areas are highly vulnerable to chronic inundation and storm surge with sea-level rise.

Chronic inundation could limit access to and use of parks and fundamentally change habitat types.

Temporary coastal flooding may temporarily limit access to beaches and parks, but once floodwaters recede, the park and beach areas should be usable again. Narrowing sandy areas could limit a beach's ability to provide valuable recreational and ecological services. Current beaches may shrink as sea levels rise. Periodic flooding has the potential to limit access to beaches and wash away the sand. Once floods recede, the beach could generally resume functionality—albeit with reduced long-term functionality as sea levels rise.

If exposed to chronic inundation or storm surge-related flooding, sensitive habitats could experience damage or significant alteration. The changes to ecosystems that come with sea-level rise impacts—changes in sediment, nutrient availability, and salinity—could lead to shifts in habitat locations and may cause certain habitats to shrink or disappear.[112] If there is sufficient available space and obstacles do not exist, habitats may be able to migrate inland to reduce exposure to chronic flooding. However, not all habitat types or species would be able to keep pace with sea-level rise, given the bluff conditions in Encinitas.

Sensitivity: Social

Shoreline change from erosion and flooding can cause inconvenience; loss of amenity, and expense to repair and prevent damage. However, it usually poses no direct and immediate threat to human life.[113] Yet, when erosion threatens to damage valuable public infrastructure, or there is not enough beach width to accommodate the recreational needs of the local population and the City's many visitors, public health and safety can be compromised.[114]

Coastal access and recreational opportunities are threatened by rising seas as permanent inundation, episodic flooding, or the erosion of beaches, recreational areas, or trails occurs. In areas where beaches cannot migrate inland due to development or more resistant landforms, beaches will narrow or disappear completely. Access to, and the quality of, water-oriented activities may also be affected. For instance, increased water levels and altered sediment patterns driven by sea level rise could lead to a change in surfing conditions – a primary tourism driver in Encinitas.[115] Shoreline change that affects recreational opportunities and visitor patterns may have severe implications for businesses, households, and individuals that depend on coastal tourism for their enjoyment or economic livelihood.

BLUFF EROSION

The soft sandstone bluffs common along the Encinitas coastline are prone to erosion from waves and stormwater runoff. In addition, sea-level rise together with increased storm frequency may accelerate beach and other shoreline erosion. As the beaches narrow, sensitive sandstone bluffs are exposed to crashing waves, which carve notches into the bluffs. Bluffs affected by these notches are then prone to episodic collapse. Consequently, residential properties on the upper bluff are experiencing land loss, and

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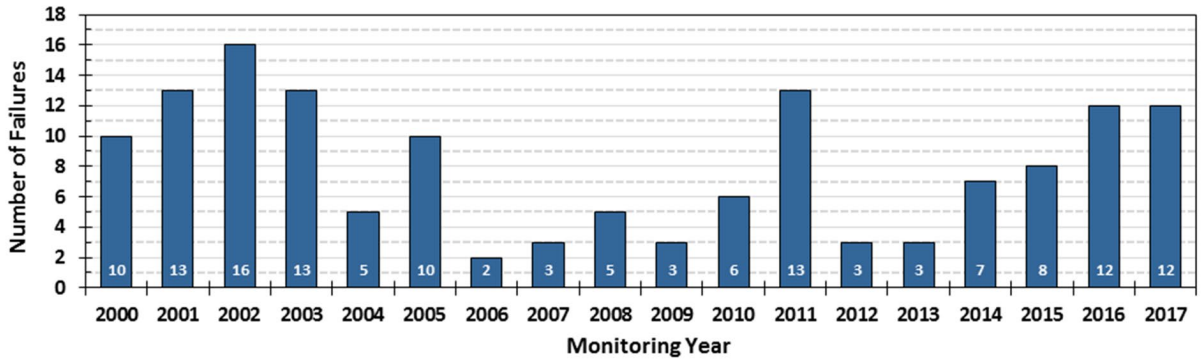
[112] ICLEI. (2017). San Diego Regional Coastal Resilience Assessment. ICLEI-Local Governments for Sustainability USA.
[113] Paterson, Shona K., Arleen O'Donnell, David K. Loomis, Ph.D. 2010. The Social and Economic Effects of Shoreline Change: North Atlantic, South Atlantic, Gulf of Mexico, and Great Lakes Regional Overview. July 30.
[114] California, State of, Department of Boating and Waterways. 2022. Shoreline Erosion Control & Public Beach Restoration. https://dbw.parks.ca.gov/?page_id=28766. Accessed July 19, 2022.
[115] California, State of, Coastal Commission. 2022. Sea Level Rise, Science & Consequences. https://www.coastal.ca.gov/climate/slr/science/. Accessed July 19, 2022.

property owners can spend significant resources to try to protect their property; otherwise, the structures will eventually be lost. In 2012, an Army Corps survey of toe notches in Encinitas showed 190 parcels had toe notches of 8-11 feet deep. The other 188 parcels had toe notches of six feet or less.[116]

In 2018, the City of Encinitas created a GIS database of bluff failure information. The database was created using the City's Bluff Explorer application and covers the period from 2000 through 2017. One hundred and forty-four coastal bluff failures were documented in the City of Encinitas during the 18-year period from 2000 through 2017. Eleven of these events were minor failures (approximately two cubic yards or less), and forty-four were major (greater than two cubic yards). The latter presents a threat to public safety and endangers both public and private property and infrastructure. The dimensions of the remaining eighty-nine bluff failures were not provided. Recorded bluff failures averaged eight events per year.[117]

Bluff Failures Documented in Encinitas, 2000-2017[118]



Source: Coastal Frontiers Organization. 2018.

Areas where bluff failures have been most frequent include, from north to south:

- Grandview Street Public Access: This location accounts for approximately 11 percent of the total number of failures registered in Encinitas (16 events). The site was particularly active in the early 2000s, but failures have occurred at this location as recently as August 2019 when three people were killed when the oceanfront bluff collapsed.[119]
- Beacon's Beach: With 5 percent of all failures (7 events), this location was also the most active in the early 2000s. Beacon Beach: A minor bluff failure forced closures on May 2, 2022, of a parking lot above Beacon's Beach in Encinitas and a switchback trail that has provided pedestrian access to the popular seafront city park for decades. The overnight cliff collapse sent soil tumbling down toward the beach but caused no reported injuries or structural damage.[120]
- Between D Street and F Street: This site, which once again was particularly active in the early 2000s, accounted for 13 percent of all the bluff failures registered in Encinitas (19 events).

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[116] United States Army Corps of Engineers. 2012. Encinitas-Solana Beach Coastal Storm Damage Reduction Feasibility Study San Diego County, California, Appendix E: Economics. Los Angeles District.

[117] Coastal Frontiers Organization. 2018. GIS-Based Bluff Failure Database and Characterization History Cities of Encinitas and Solana Beach. Bluff Failure Characterization, 4.1. City of Encinitas. Page 8.

[118] Coastal Frontiers Organization. 2018. GIS-Based Bluff Failure Database and Characterization History Cities of Encinitas and Solana Beach.

[119] Riggins, Alex and Gary Worth. 2019. 3 People killed in Encinitas beach cliff collapse. San Diego Union-Tribune. August 3rd.

[120] Ireland, Elizabeth. 2022. Bluff Collapse in Encinitas Forces Parking, Pedestrian-Access Closures 'Until Further Notice'. Times of San Diego. May 2.

- I Street: In sharp contrast with the three previous areas, the first reported failure at this location occurred in 2006. The site is still active, with three failures occurring in 2017. A total of eight failure events have occurred in the area fronting I Street, 6 percent of the total.
- Swami's Beach: Nine bluff failures have been documented at Swami's Beach during the monitoring period (6 percent of the total). Five of these events occurred in 2016 and 2017, making Swami's Beach a particularly active site.

The 2018 Coastal Frontier's bluff failure report provided two significant conclusions regarding temporal changes and the impact of environmental variables, as follows:

Temporal Changes

The data suggest that bluff failure spatial distribution in Encinitas has changed noticeably over time. While in the early 2000s, bluff failures tended to cluster at specific locations (such as the three first sites listed above). In recent years failures have been more evenly distributed along the coastline.

Environmental Variables

When the entire study period is considered, significant correlations between the environmental variables and bluff failures were conspicuously absent:

- Wave Conditions: The years 2000 through 2005, when bluff failures were particularly frequent (67 events in six years), were characterized by unexceptional oceanographic conditions (storm days and wave energy index). The conditions were more severe from 2006 through 2013, but the number of bluff failures was significantly lower (38 events in eight years).
- Precipitation: Similarly, annual precipitation values were not significantly higher in the early 2000s when bluff failure frequency was highest than during the rest of the study period (2005 being the exception). The correlation coefficient between precipitation and bluff failure events was 0.03.
- El Niño: While a relativity high number of bluff failures occurred in 2003 and 2016 ("moderate" and "very strong" El Niño years, respectively), the number of failures recorded in 2010 ("strong" El Niño year) was modest.[121]

Figure 3-9: Bluff Retreat illustrates cliff retreat based on a USGS dataset containing projections of coastal cliff-retreat rates and positions for future sea-level rise scenarios. As the sea level rises, waves break closer to the sea cliff, more wave energy impacts the cliffs, and cliff erosion rates accelerate. The CoSMoS model also includes wave run-up, wave set-up that raises the water level during big-wave events, and tidal levels.

The various levels of exposure to beach erosion are relatively similar and are difficult to distinguish at a City-wide scale. Four maps at a more detailed extent have been created for Encinitas in Figure 3-9 (through Figure 3-12): Bluff Retreat as the properties and structures appear to be similarly affected for all three SLR scenarios. In this map, "Hold the Line" assumes the current infrastructure will continue in place.

Cliff retreat data was not modeled by the USGS for the area adjacent to San Elijo State Beach parking lot (labeled 8* in Figure 3-9). This specific area is not included in the USGS CoSMoS 3.0 Cliff Retreat data set. USGS staff believe the area may not have been modeled because of a misinterpretation of the topography as dunes (versus cliffs) next to the inlet.[122]

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[121] Coastal Frontiers Organization. 2018. GIS-Based Bluff Failure Database and Characterization History Cities of Encinitas and Solana Beach.

[122] United States Geological Survey. 2022. Per email correspondence with Amy Foxgrover, September 29.

Figure 3-9: Bluff Retreat: Section 1

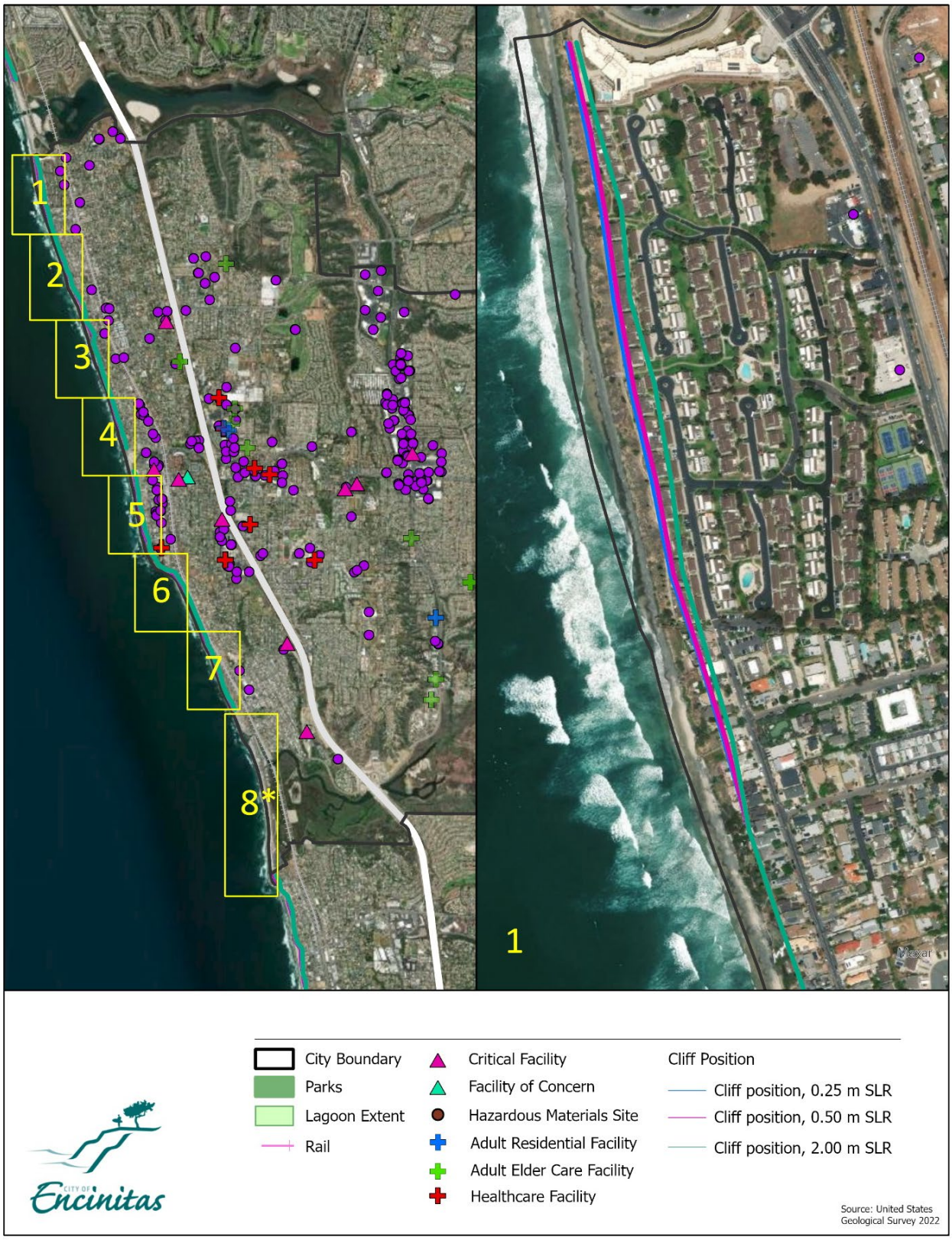

Figure 3-10: Bluff Retreat: Sections 2 and 3

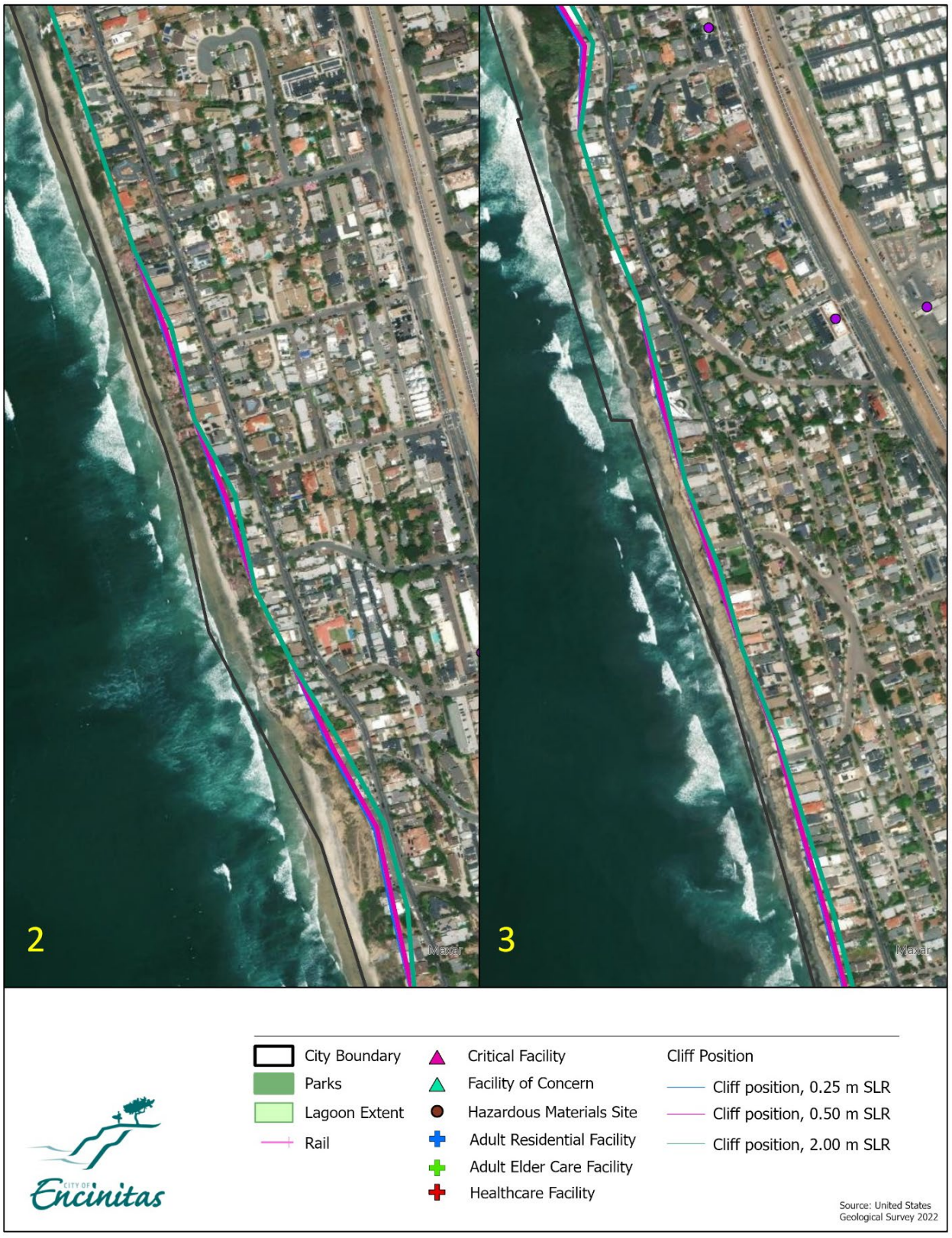

Figure 3-11: Bluff Retreat: Sections 4 and 5

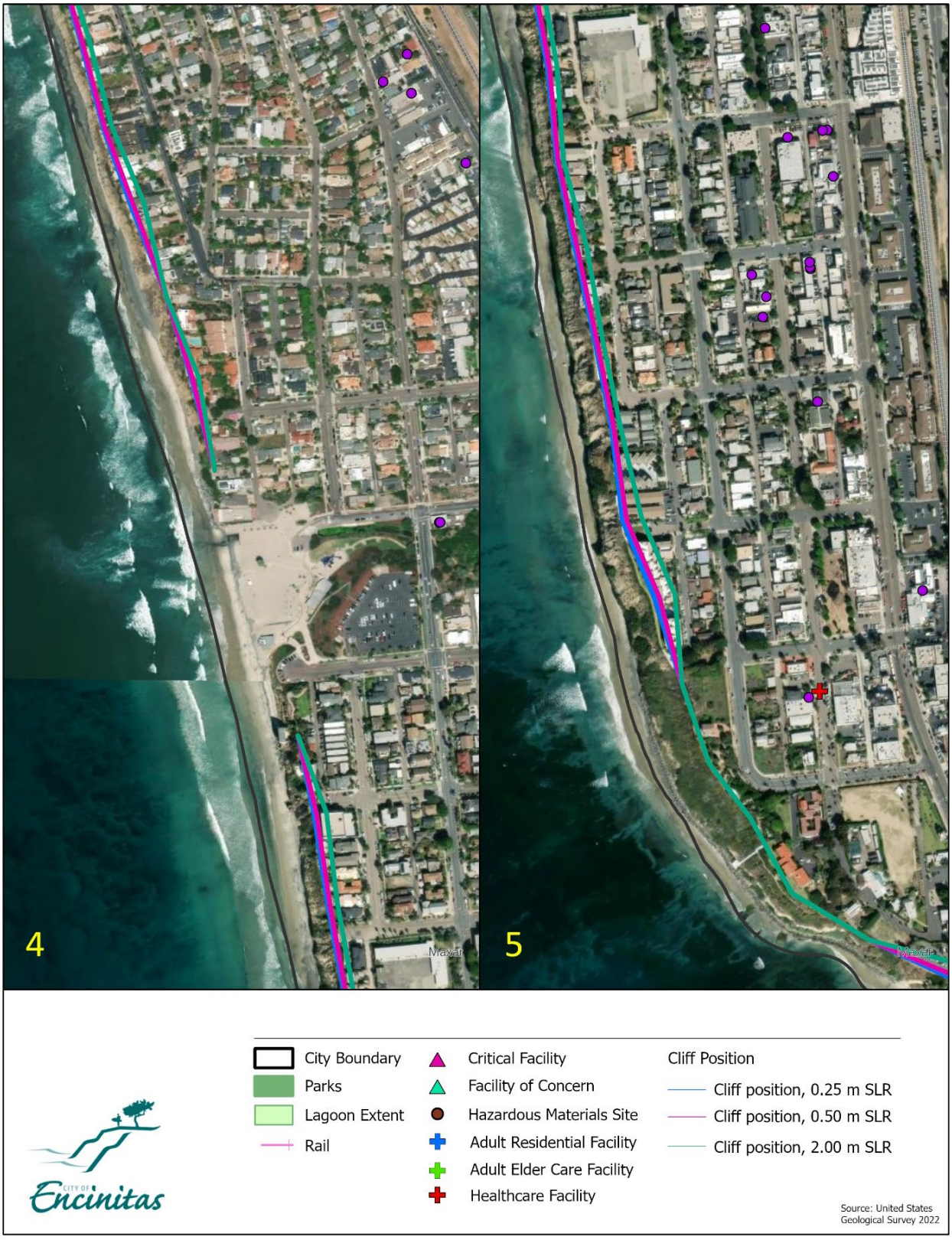

Figure 3-12: Bluff Retreat: Sections 6 and 7

Further analysis did not identify any Critical Facilities, Facilities of Concern, or hazardous materials sites located in the bluff erosion areas. None of the healthcare, elder care, or adult residential facilities are within the bluff retreat areas. The socio-economic impacts on the local community (Table 3-13) mirror those of storm surge and chronic inundation, whereby the impacted populations are not considered highly vulnerable from a climate change perspective.

Table 3-13: Bluff Retreat – Threatened Populations	0.25 – 2 Meters	Encinitas
Total Population	483	62,007
Percent of residents that are children (less than 10 years)	7.8%	11.0%
Percent of households that have people 65+ years	22.4%	34.1%
Percentage of households with at least one person living with a disability	18.0%	19.1%[1]
Median age	42.3	43
Total households	183	23,893
Median household income	$108,056	$120,488
Percent of rental households	56.7%	36.2%
Percent of household income below the poverty level	4.4%	7.2%

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

Sensitivity: Physical

Bridges, major arterials, and outfalls show vulnerability to coastal erosion. Permanent impacts from erosion pose a more significant challenge for adaptation. However, there is significant redundancy in the roadway network. Rerouting traffic through a detour or temporarily limiting service on affected roads would affect fewer travelers than on state-owned routes (e.g., state highways and freeways). There is low redundancy in the bridge network. Daily flooding could require the creation of alternate routes outside of inundation zones.

It is difficult to adapt outfalls (by increasing elevation and/or adding backflow valves). There are spatial and topographical constraints to elevating outfall pipes, which add to the time and cost of required engineering. There are also the spatial constraints of other existing structures and easement widths when considering the relocation of an outfall.

Erosion could erase or significantly alter habitable land within conservation areas. The changes to ecosystems that come with sea-level rise impacts—changes in sediment, nutrient availability, and salinity—could lead to shifts in habitat locations and may cause certain habitats to shrink or disappear. Inland migration might be possible, though only likely in the lagoon adjacent areas.[123]

Economic Impacts

Among the most significant issues driving coastal management and policy in the face of sea-level rise is the need to protect private property. Sea-level rise and associated flooding will threaten nearly $100 billion worth of property along the California coast by 2100[124], and coastal landowners and planners will inevitably act to protect their assets from these losses. Landowners overwhelmingly default to standard risk-mitigation techniques to sea-level rise induced problems – specifically, coastal armoring solutions. The results from a 2016 California State Coastal Conservancy study called into question the conventional

[123] ICLEI. (2017). *San Diego Regional Coastal Resilience Assessment.* ICLEI-Local Governments for Sustainability USA.
[124] Heberger, M., H. Cooley, P. Herrera, P.H. Gleick, and E. Moore. 2009. The Impacts of Sea-Level Rise on the California Coast. California Climate Change Center.

wisdom that shoreline armoring is the best response to coastal erosion. In the scenarios analyzed, shoreline armoring yielded significantly lower net present values than other options. While the study notes that Monterey is not representative of all coastal areas, the result could be applicable to other urbanized stretches of the California coastline with similar levels of exposure to coastal hazards.[125]

Adaptive Capacity

The City is currently working on a series of area-specific planning efforts to increase community and local ecosystem resiliency to the impacts of sea-level rise, described as follows:

Coastal Storm Damage Reduction

Opportunities exist to reduce bluff failures and/or mitigate the danger from those failures. Encinitas employs lifeguards year-round that encourage recreating away from the base of the bluffs. As beaches are highly impacted by coastal erosion, the City can also increase the size of the beach area to provide reduced scouring and provide significant recreational benefits as well. Two engineering methods may be employed to reduce storm damage: soft-structural and hard-structural. The soft-structural method includes beach fills, sand scraping, or sand bypassing/recycling. Hard structures consist of sand retention (see below for a discussion of Beach Sand Nourishment), features that impede alongshore sand movement (e.g., groins, jetties, artificial reefs, or detached breakwaters), and storm-protective features (See Chapter 4: Climate Adaptation Framework), which directly prevent shoreline or upland erosion (e.g., coastal armoring, seawalls, or revetments).[126]

Cardiff Beach Living Shoreline Project

In collaboration with the State Coastal Conservancy and the California State Parks, the City developed the Cardiff Beach Living Shoreline. The project supports efforts for a local dune restoration project to restore heavily impacted coastal habitat and provide natural sea-level rise adaptation by protecting a vulnerable segment of Cardiff Beach. The project provided innovative approaches for climate resiliency and sea-level rise adaptation, buffering the City, specifically HWY 101, from storm surge and flooding during extreme weather events. The dune has been constructed and is currently in year 4 of a 5-year post construction monitoring period. It is currently being monitored by both consultants and academics at UCLA. The dune serves as a buffer against storm surge. In times when it has experienced significant erosion from storm surge, the dune has been replenished to as-built grade by sand from yearly maintenance dredging of the San Elijo Lagoon. As such, the dune has a reliable source of beach quality material to maintain its effectiveness.[127]

San Elijo Lagoon Restoration Project

The San Elijo Lagoon Conservancy, in coordination with the City, SANDAG, Caltrans, and supporting engineering and construction firms, completed the San Elijo Lagoon Restoration Project in 2021. The project consisted of selective dredging and filling the mudflats and salt marsh habitat within the lagoon, intended to improve tidal circulation and restore sensitive habitats currently compromised by surrounding land uses. The project provides continuity of habitats currently threatened by sea-level rise and provide increased adaptive capacity for the surrounding communities during flooding and extreme weather events.

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[125] California State Coastal Conservancy. 2016. Economic Impacts of Climate Adaptation Strategies for Southern Monterey Bay. The Nature Conservancy.

[126] United States Army Corps of Engineers. 2012. *Encinitas-Solana Beach Coastal Storm Damage Reduction Feasibility Study San Diego County, California, Appendix E: Economics.* Los Angeles District.

[127] City of Encinitas. 2022. Written comments by Liam Maxwell. June 23, 2022.

This project will add 300,000 cubic yards of material to the beach and nearshore environment, improving coastal resiliency for years. The project includes a 50-year Restoration Monitoring Plan that includes monitoring of thirteen key variables within the wetland to ensure there are no adverse impacts and the wetland ecosystem was improved. The monitoring occurs first is the wetland itself, and second is the local coastal marine environment where the project provided beach replenishment sand. [128]

Beach Sand Nourishment

U.S. Army Corps of Engineers San Diego County, CA Project (formerly known and referred to as Encinitas-Solana Beach Coastal Storm Damage Reduction Project)

The City of Encinitas and Solana Beach have partnered to bring a 50-year beach nourishment project with the support of the US Army Corps of Engineers and the State Parks and Recreation Department. This project would provide stability and resiliency to the coastline. Construction of the project is to begin in 2023. This project would increase the existing width of 7,800 feet of coastline an additional 50 feet seaward. The project will place 340,000 cubic yards of sediment on the beaches initially and renourish the beaches with 220,000 -340,000 cubic yards of sediment every 5 years thereafter for the entire 50-year lifespan of the project. It is estimated that in total this project will provide 2.32 million-3.15 million cubic yards [129] of sediment onto the beaches. [130]

Opportunistic Beach Fill Program

In 1993, SANDAG adopted a comprehensive plan for erosion mitigation known as the "Shoreline Preservation Strategy for the San Diego Region". The Strategy proposed an extensive beach building and maintenance program to provide for environmental quality, recreation, and storm protection in the coastal zone. Following a number of modest beach nourishment projects that were undertaken primarily on an opportunistic basis (i.e., when sand became available from other sources), the Regional Beach Sand Project I (RBSP I) was conceived and implemented in 2001 as a more comprehensive approach to restoring the County's sand-starved beaches. Based on the success of RBSP I, a second Regional Beach Sand Project (the RBSP II) was conducted eleven years later in 2012.

The Opportunistic Beach Fill Program identifies construction projects that export sandy beach material and then haul the material to the beach at Moonlight, Cardiff, Leucadia, or Ponto State Beach. The City collaborates with developers to conduct monitoring and permitting and share the cost for hauling the material to the beach.

2001 Regional Beach Sand Project (RBSP I)

Between April 6 and September 23, 2001, the RBSP I provided 2.1 million cy of beach-quality sand to twelve receiver beaches located between Imperial Beach and Oceanside. The material was excavated from six offshore borrow areas using a trailing suction hopper dredge and pumped onto the subaerial portion of each receiver beach (Noble, 2002). The median grain size (d50) varied considerably among the borrow areas, ranging from 0.14 mm (fine sand) to 0.62 mm (coarse sand).

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[128] The Nature Collective. 2022. San Elijo Lagoon Restoration. https://thenaturecollective.org/project/san-elijo-lagoon-restoration/ Accessed July 12, 2022.

[129] Renourishment volume ranges were determined based on low and high sea level rise scenarios. Information provided by Liam Maxwell, City of Encinitas. June 23, 2022.

[130] City of Encinitas. 2022. Written comments by Liam Maxwell. June 23, 2022.

- Beach replenishment at Batiquitos would involve the placement of dredged sediment from a point approximately 850 feet south of the Batiquitos Lagoon into the community of Leucadia and Leucadia State Beach. Batiquitos received 118,000 cubic yards along 1500 feet of beach, while Leucadia received 132,000 cubic yards along 2700 feet of beach.
- Beach replenishment from August 10th through August 16th at Moonlight Beach consisted of the placement of 105,000 cubic yards of dredged sediment along 800 feet of beach.
- Beach replenishment from August 2nd through August 10th at the Cardiff site consisted of the placement of 101,000 cubic yards of dredged sediment along 900 of Cardiff State Beach south of the San Elijo Lagoon inlet and Restaurant Row. [131]

2012 Regional Beach Sand Project (RBSP II)

The RBSP II project was smaller in scope than RBSP I, providing approximately 1.5 million cy of beach quality sand to eight receiver beaches located between Imperial Beach and Oceanside. The material was excavated from three offshore borrow areas, pumped onto the subaerial portion of each receiver beach, and shaped to the design configuration using conventional earth-moving equipment. The receiver sites were nearly identical to eight of the RBSP I sites, but four receiver beaches nourished in RBSP I were not included in the second project (Mission Beach, Torrey Pines, Del Mar, and Leucadia).

- Moonlight Beach: Sand replenishment was completed between October 20th and October 25th, 2022. Approximately 92,000 cubic yards of sand was placed on 800 feet of beach just north of the D St. access point at Moonlight Beach.
- Cardiff Beach: Sand replenishment between the Chart House restaurant and just north of South Cardiff State Beach was completed between October 25th and October 28th, 2012. Approximately 89,000 cubic yards was placed on about 1,600 feet of beach.
- Batiquitos Beach: Sand replenishment was completed between October 28th and November 4th, 2012. Approximately 106,000 cubic yards of new sand was placed on 1,400 feet of beach between the Batiquitos Lagoon mouth and the bluff-backed area of the beach. [132]

A third installment of the Opportunistic Beach Fill Program is currently planned by SANDAG.

3.3.2.5 LANDSLIDES AND LIQUEFACTION

In the context of climate change vulnerability, increased liquefaction and heightened possibility of landslide events are a concern. Both hazards have an indirect effect of increased precipitation and flooding because soils must be saturated with water for liquefaction or landslides to occur.

- Liquefaction occurs when seismic energy shakes an area with low-density, fine grain soil, like sand or silt, which is also saturated with water. When the shaking motion reaches these areas, it can cause these loosely packed soils to suddenly compact, making the waterlogged sediment behave more like a liquid than solid ground.
- Landslides occur when the earth on slopes becomes destabilized, typically after heavy rains, when the precipitation saturates the soil and makes it less stable, or when significant erosion from rainfall

[131] SANDAG. 2000. The San Diego Regional Beach Sand Project Final Environmental Impact Report/ Review Environmental Assessment.
[132] SANDAG. 2012 Regional Beach Sand Project. https://www.sandag.org/index.asp?projectid=358&fuseaction=projects.detail. Accessed on April 6, 2022.

destabilizes the ground. Slopes that have recently burned face a greater risk from rain-induced landslides, as the fires burn the trees, brush, and other vegetation that help stabilize the earth.

Earthquakes may also be a source of liquefaction and landslides as the shaking can destabilize already loosened soils. Southern California is considered one of the most seismically active regions in the United States because the faulting is dominated by the compression regime associated with the "big bend" of the San Andreas Fault Zone.

The San Diego region is transected by several sub-parallel, pervasive fault zones and smaller faults. The City of Encinitas is in the southern part of the Peninsular Ranges geologic Province: an area exposed to risk from multiple earthquake fault zones. The San Andreas Fault, which runs from Baja, California to San Francisco, is approximately one hundred miles east of the City and poses a potential risk for the San Diego region. However, for the City, the highest risks originate from nearby zones such as the Elsinore Fault Zone, the Rose Canyon Fault Zone, and other offshore faults. Each zone has the potential to cause moderate to large earthquakes that would cause ground shaking in Encinitas.[133]

Historical Earthquake Events

- November 22, 1800 – A 6.5 magnitude occurred on the Rose Canyon fault offshore from Oceanside. It cracked adobe walls at the missions of San Diego de Alcala and San Juan Capistrano.
- May 27, 1862 – A magnitude 6.0 earthquake centered on the Rose Canyon or Coronado Band faults.
- July 13, 1986 – A magnitude 5.4 earthquake centered off the coast of Oceanside on the Coronado Bank Fault.

VULNERABILITY

Exposure

Figure 3-13: Deep-Seated Landslide Susceptibility shows the relative likelihood of deep-seated land sliding based on regional estimates of rock strength and steepness of slopes. On the most basic level, weak rocks and steep slopes are most likely to generate landslides. The map uses detailed information on the location of past landslides, the location and relative strength of rock units, and the steepness of the slope to estimate susceptibility to deep-seated land sliding. This landslide susceptibility map is intended to provide infrastructure owners, emergency planners, and the public with a general overview of where landslides are more likely to occur.[134] While no definitive scale for measuring landslides exists, landslide events are usually measured using the amount of material displaced (i.e., the cubic feet of earth that moved). In addition, to these landslide hazards, the California Geological Survey has mapped deep-seated landslide hazards, which uses a scale of landslide susceptibility based on slope steepness and the strength of the underlying rock, with zero being no susceptibility and ten being the highest susceptibility.

Only one critical facility, the wastewater treatment facility at 2695 Manchester Avenue, falls within the Deep-Seated Landslide Susceptibility area. There are 36 hazardous materials facilities that fall within the Deep-Seated Landslide Susceptibility area, comprised of medical facilities, fuel stations, and various commercial enterprises with chemicals such as diesel, nitrogen, sulfuric acid, and nitrous oxide.

[133] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029: Appendix B.
[134] County of San Diego, Planning and Development Services, LUEG-GIS Service and National Earthquake Hazards Reduction Program. 2017.

Figure 3-13: Deep-Seated Landslide Susceptibility

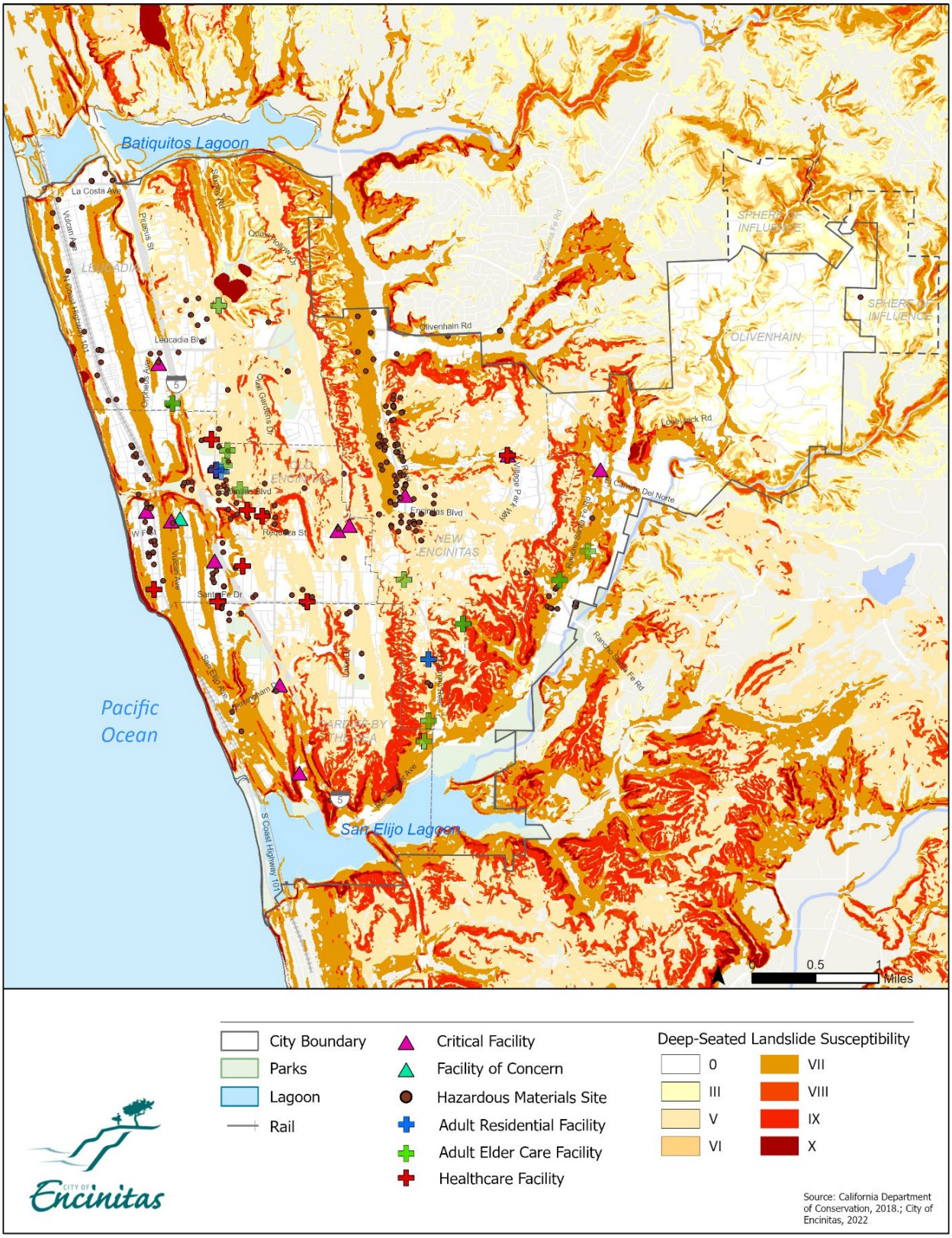


Table 3-14: Critical Facilities and Facilities of Concern (Deep-Seated Landslide Susceptibility)

Category	Number of Facilities	
	Critical	Concern
City Facilities (Fire, Sheriff)	0	-
Community & Senior Center	0	-
Library	-	0
Water/Sewer Facilities	1	-
Hospital	0	-
Total	**1**	**0**

Source: City of Encinitas 2022

Figure 3-14: Liquefaction Potential highlights areas with potential for liquefaction. In Encinitas, there may be a potential for liquefaction in areas with loose sandy soils combined with a shallow groundwater table, which typically are in alluvial river valleys/basins and floodplains. The underlying dataset combines existing liquefaction areas from local maps, National Earthquake Hazards Reduction Program, which rates soils from hard to soft and known hydric soils from the United States Department of Agriculture Soil Survey to identify the potential areas liquefaction may occur.

The liquefaction areas mirror the 100-year FEMA floodplain as illustrated in **Figure 3-6: Flood Hazard Zones**. There are no Critical Facilities, Facilities of Concern, or hazardous materials sites located in the potential liquefaction areas. None of the healthcare, elder care, or adult residential facilities are within the potential liquefaction areas.

Sensitivity: Physical

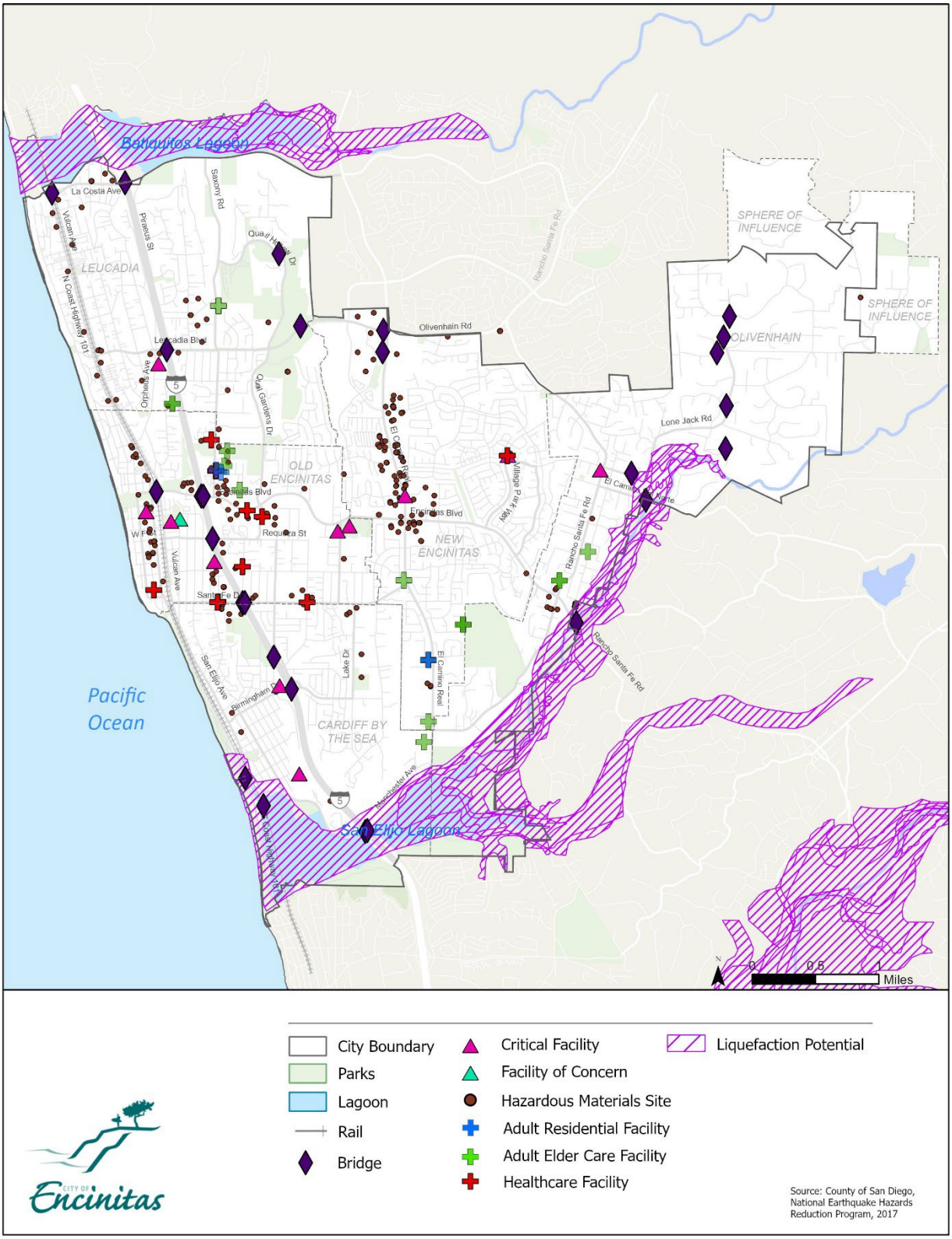
As climate change is anticipated to change the usual precipitation patterns in Southern California, including Encinitas, periods of both rain and drought are anticipated to become more intense and frequent. Therefore, depending on the circumstances, climate change could increase the future risk of liquefaction in Encinitas. Given the topography, it is anticipated that landslide risk will remain high in those areas identified in darker red in **Figure 3-13: Deep-Seated Landslide Susceptibility**. However, the City requires mitigation of these types of conditions, which reduces landslide potential in the developed areas of the City (See Adaptive Capacity: Hillside/Inland Bluff Overlay Zone regulations).

During liquefaction events, the liquified soil can lose its stability which can cause damage to buildings and infrastructure built upon it. In severe cases, buildings may completely collapse. Pipelines or other utility lines running through a liquefaction zone can be breached during an event, potentially leading to flooding or the release of hazardous materials. Considering a "major liquefied petroleum transmission line pass(es) through the community,"[135] the City should monitor the potential impacts of a seismic event on this critical infrastructure.

There are multiple bridges located in the potential liquefaction areas, including but not limited to the La Bajada, San Elijo Overcrossing, and the Railway Bridge at San Elijo. The MJHMP identifies the replacement of the Highway 101 Bridge as a Priority Action because a Seismic Vulnerability Study concluded that the bridge (constructed in 1932) is susceptible to failure/collapse during a significant seismic event or tidal influx due to strong storms. With potential changes in precipitation, bridges should be monitored periodically for seismic vulnerability.

[135] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

Figure 3-14: Liquefaction Potential



As discussed in the City of Encinitas Housing Element, major onshore and offshore fault zones present a seismic risk to the City, like most Southern California communities. In the early 1990s, the City surveyed unreinforced masonry buildings in Encinitas and identified structures vulnerable to earthquake forces. The survey provides twenty site addresses in the City that are subject to risk and their estimated occupancy information and building condition. None of the sites for lower-income households identified in the site inventory analysis are at risk due to the presence of unreinforced masonry buildings.[136]

Considering the future degradation of structures, the City will want to monitor the quality of older housing stock to ensure it is still safe in a liquefaction event. The U. S. Department of Housing and Urban Development may consider units substandard if they were built before 1940. Eight hundred sixty-two units in Encinitas were built before 1940, approximately three percent of the total housing in the City. The City has a minimal number of units in need of repair or rehabilitation, especially given the high percentage of newly constructed units. Based upon a combination of previous "windshield surveys," observations and experiences of the code enforcement and planning staff, and indicators from other surveys, the City has estimated that 50-100 units would fall into this category, although most, if not all, meet minimum housing and building code requirements.

Approximately 25 percent of the housing stock is approaching 50 years of age or older and is more likely to require major rehabilitation. Housing that is not maintained can discourage reinvestment, depress neighboring property values, and negatively impact a neighborhood's quality of life. Improving housing is an important goal of the City. The age of the City's housing stock indicates a potential need for continued code enforcement, property maintenance, and housing rehabilitation programs to stem housing deterioration. Overall, however, given residents' moderate to higher incomes, deferred maintenance is not a prevalent issue in the City.[137]

Sensitivity: Social

Approximately 15 percent of the City's households are potentially exposed to landslide hazards. The demographics of vulnerable populations mirror those of the entire City, except for the percent of households that have people aged 65 or older residing in the home is less than that of the City (approximately 643 homes). Relative to other hazards (e.g., coastal flooding), the potential losses from one large landslide or multiple landslides caused by soil saturation or an earthquake could be comparatively large in most cases.

[136] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029: Appendix B.
[137] City of Encinitas. 2021. Encinitas 6th Cycle Housing Element 2021-2029: Appendix B.

Table 3-15: Deep Seated Landslide – Threatened Populations

	Landslide[1]	Encinitas
Total Population	8,875	62,007
Percent of residents that are children (less than 10 years)	10.2%	11.0%
Percent of households that have people 65+ years	17.0%	34.1%
Percentage of households with at least one person living with a disability	20.3%	19.1%[1]
Median age	42.3	43
Total households	3,782	23,893
Median household income	$116,840	$120,488
Percent of rental households	38.1%	36.2%
Percent of household income below the poverty level	7.5%	7.2%

Source: US Census Bureau, ACS 2020, ESRI 2022[1]

Adaptive Capacity

The City has addressed seismic hazards in the Hazard Mitigation Plan and enforces regulations intended to protect people and assets from seismic events. The plans and programs for the City and supporting agencies are described below.

San Diego County Multi-jurisdictional Hazard Mitigation Plan (2017)

The 2017 MJHMP includes objectives and actions to decrease the risks associated with increased temperature and extreme heat events. Goal 4 of the 2017 MJHMP Chapter on Encinitas intends to "[r]educe the possibility of damage and losses to existing assets, particularly people, critical facilities/infrastructure, and City-owned facilities, due to geologic hazards, including earthquake, liquefaction, and landslides." The goal includes four corresponding objectives and twenty-three actions to help the City prepare for the impacts of wildfires (and structural fires). Objectives and actions focus on planning, protecting vulnerable assets susceptible to seismic events, agency coordination, and public education.[138]

Hillside/ Inland Bluff Overlay Zone

The Hillside/Inland Bluff Overlay Zone requires that development be restricted in those areas where slopes exceed 25% and encroachments have been minimized to the greatest extent feasible. The Hillside/ Inland Bluff Overlay Zone regulations apply to all areas within the Special Study Overlay Zone, where site-specific analysis indicates that 10 percent or more of the area of a parcel of land exceeds 25 percent slope.

[138] San Diego County Multi-Jurisdictional Hazard Mitigation Plan, Section Five, Encinitas. October 2017.

CHAPTER 4. CLIMATE ADAPTATION FRAMEWORK

This chapter provides actions to build adaptive capacity and increase resilience to climate change-related impacts in Encinitas. It is organized by climate hazard (extreme heat, drought, wildfire plus smoke, flooding, and liquefaction) consistent with the Vulnerability Assessment.

The City already has robust plans with respect to hazard mitigation and preparedness. The following recommendations are intended to augment mitigation and preparedness policies in the existing General Plan and Multi-Jurisdictional Hazard Mitigation Plan and address more fully the recovery and response components of disaster planning that are essential for achieving a more resilient community. Actions in this chapter work to address multiple hazards. For example, the measures to improve air quality correlate closely with those for extreme heat (e.g., planting trees).

As the climate will continue to evolve, it is recommended the City of Encinitas take an "Adaptive Pathways" approach to climate adaptation. Adaptive Pathways is a planning framework that considers the uncertainty of climate change and the change in risk conditions and allows for flexibility in implementation to improve effectiveness and economic efficiency. An adaptive pathways approach identifies thresholds or points in time when decisions or action pathways should be revisited, allowing for adjustments in implementation to be made based on changing conditions. It is recommended the City first identify climate change adaptation policies and programs, then construct an adaptive pathways approach appropriate to prepare and respond to individual or multiple climate hazards.

Then employing the adaptive pathways approach, the following actions for resiliency and adaptation should be considered and implemented as appropriate:

1. GENERAL CLIMATE HAZARD ADAPTATION

Interagency Coordination

1-1 Collaborate with local and regional partners to provide robust critical infrastructure and facility planning, monitoring, and maintenance to prevent and respond to damage from climate change effects, including fallen trees, flood waters, wildfires, landslides, and severe storms.

Education and Outreach

1-2 Improve flood and heat warning and information dissemination, focusing on ensuring those who lack internet access and cell phones and for whom English is a second language can receive and understand emergency warnings.

Planning and Engineering

1-3 Continue to integrate findings of climate vulnerability into all phases of emergency planning.

1-4 As necessary, identify additional community safety locations that may serve as temporary shelter or refuge during hazard events.

1-5 Develop and update protocols for routing emergency services (fire, ambulance, police) to ensure all homes and businesses can be accessed in the event of an emergency.

1-6 Consider the installation of microgrids at critical emergency response facilities such as fire stations, community centers, and designated emergency evacuation sites.

a. Address housing insecurity and reduce the exposure of persons experiencing homelessness to safety and health impacts from climate disasters.

1-7 Include provisions for special needs populations and communities with low rates of car ownership in emergency response procedures.

a. Vulnerable Population Registry. Develop a voluntary vulnerable population registry and subsequent priority list to help first responders better provide services and meet the needs of those most in need.
b. Emergency Shuttle. Explore the possibility of partnerships for providing an emergency evacuation shuttle service.
c. Know Your Neighbor Program. Coordinate a Know Your Neighbor Program where community leaders and neighbors provide resources and check in on vulnerable populations during hazard events where people shelter at home.
d. Regular Needs Assessment. Regularly meet with community leaders representing special needs populations, including seniors, to maintain continuous two-way communication. This should include surveys and other needs assessments to refine notification and response policies.

Building and Environmental Design

1-8 Use nature-based solutions to improve resilience while promoting biodiversity (e.g., green infrastructure projects such as rain gardens or bioswales, habitat corridors, and land conservation).

2. EXTREME HEAT EVENTS

Interagency Coordination

2-1 Coordinate with relevant agencies including, but not limited to, the San Diego County Office of Emergency Services and Encinitas Fire and Marine Safety Department to better plan and prepare for extreme heat events and the increased demand for Emergency services associated with these events. (CAP Strategy 5: Temperature and Extreme Heat)

2-2 Protect the energy grid by working with utility providers in the region to harden existing energy infrastructure systems against damage from climate change-related effects and expand redundancy in the energy network through microgrids and decentralized energy systems.

2-3 Provide working touchless water refill stations at public facilities, parks, and bus shelters.

2-4 Collaborate with regional transit providers to increase shading and heat-mitigating materials on pedestrian walkways and transit stops.

Education and Outreach

2-5 Conduct outreach to educate City residents on the health risks associated with extreme heat events and strategies to prepare for these events. Alongside general outreach, particular focus should be given to educating populations vulnerable to extreme heat, including children and the elderly. (CAP Strategy 4: Temperature and Extreme Heat)

2-6 Work with local and regional employers to ensure worker protection measures are in place for extreme heat events. Measures may include assurance of adequate water, shade, rest breaks,

and training on heat risks for all employees working in the City. (CAP Strategy 6: Temperature and Extreme Heat)

2-7 Protect vulnerable populations from high temperatures:

a. Improve access to air conditioning. Improve the availability of air conditioning to those who do not currently have access.

b. Incentivize the use of air conditioning. Work with local governments and utilities to review the adequacy of programs designed to help vulnerable populations stay cool during heat waves, with attention to ways to offset the economic impacts on seniors and low-income groups.

Planning and Engineering

2-8 Expand the number of cooling centers from two (Encinitas Library and the Encinitas Community and Senior Center) to three. Determine location based on accessibility to at-risk populations.

2-9 Collaborate with local businesses and institutions to provide a "Cool Zone" area network (i.e., cooling centers) for vulnerable residents to rest in air-conditioned environments during high-temperature periods and heatwave events. (CAP Strategy 7: Temperature and Extreme Heat)

2-10 Partner with the local school districts to ensure every school has adequate air conditioning.

2-11 Expand hours of operation of cooling centers when the temperature exceeds Cal-Adapt thresholds for extreme heat days and during hazardous air days.

2-12 Supply cooling centers with refrigerators for storing medicine, backup water supplies, and social services information in multiple languages.

2-13 Collaborate with federal, state, regional, and local partners to develop a community-wide outreach program to educate vulnerable populations on how to prepare for and recover from climate change effects.

Building and Environmental Design

2-14 Incorporate green infrastructure strategies into new and existing infrastructure to mitigate the effects of the UHIE by reducing the area of heat-absorbing paved surfaces and increasing landscaped areas, including, but not limited to: (Revised CAP Strategy 1: Temperature and Extreme Heat)

a. Plant City trees. Increase City's urban tree canopy cover percentage, especially for areas with the highest UHI contribution: large parking lots, arterial roads, and dark roofs on buildings.

b. Use vegetation. For example, green walls and green roofs where trees are not possible.

c. Restore urban streams. Where possible, restore natural geomorphic and hydrologic features to failing culverted and channelized streams in urban areas.

d. Shade green open space. Use trees to provide shade at outdoor worksites and places where people recreate.

e. Ensure robust maintenance program is in place for City-maintained trees, landscaping and other vegetation.

2-15 Examine and expand the use of porous pavements in parking lots to lower nighttime surface temperatures as compared to other pavements, which also provides water quality benefits.

2-16 Promote the use of solar carports on new and existing surface parking lots to mitigate heat absorption and increase shaded areas for the City's population. Implementation priority will be given to City-owned parking lots to serve as an example. (CAP Strategy 2: Temperature and Extreme Heat)

2-17 Promote passive cooling design (e.g., appropriate building orientation, shade trees, window shading, cool roofs) and use the California Building Standards Code (CalGreen) voluntary

measures for residential and non-residential buildings to improve energy efficiency. (CAP Strategy 3: Temperature and Extreme Heat)

2-18 Participate in beach nourishment projects that maintain local wide sandy beaches. Encinitas beaches are considered regional "Cool Zones." By maintaining the beach width, the City will be able to handle larger numbers of coastal visitors when needed, keeping the public a safe distance from the bluffs. (CAP Strategy 8: Coastal Erosion and Predicted Sea-Level Rise)

2-19 Promote private property tree planting by bulk purchasing trees for at-and below-cost sales to property owners for planting on private property.

3. DROUGHT + WATER SUPPLY

Interagency Coordination

3-1 Coordinate with local and regional partners (SDWD, OMWD, SDCWA) to support and improve water conservation efforts and programs for City residents. Coordinate with these agencies to provide educational outreach to residents on how best to conserve water and reduce water demand. (CAP Strategy 1: Precipitation Patterns and Water Supply)

3-2 Work with relevant water agencies, including SDCWA, OMWD, and SDWD, to evaluate current and future water supply systems and vulnerabilities and how water resources may be impacted by climate change. (CAP Strategy 3: Precipitation Patterns and Water Supply)

Planning and Engineering

3-3 Evaluate and improve the capacity of stormwater infrastructure for high-intensity rainfall events.

3-4 Invest in the use of green infrastructure (e.g. permeable pavements and landscaping) in developed areas and restrict the use of paved surfaces.

3-5 Improve sewage and solid-waste management infrastructure to reduce vulnerabilities to flooding and inundation, especially older infrastructure that is undersized or inadequate.

Education and Outreach

3-6 Expand upon existing water conservation education outreach programs for residents and businesses. Expand upon the City's existing Water Efficient Landscape Regulation to promote the use of climate-appropriate landscaping (e.g., xeriscaping) to reduce demand for potable water resources among City residents. Promote current funding available through the Save Our Water Turf Replacement Rebate Program sponsored by the CA Department of Water Resources. (CAP Strategy 5: Precipitation Patterns and Water Supply)

Water Conservation

3-7 Expand and/or improve the recycled water efforts currently in place at the San Elijo Water Reclamation Facility along with corresponding water conservation efforts to ensure that, when economically viable, all current and future City landscaping can source the majority of landscaping water needs from recycled sources. (CAP Strategy 2: Precipitation Patterns and Water Supply)

3-8 Continue marketing and outreach programs to promote participation in existing water conservation rebates and incentive programs in the region. Current programs for southern California include Water Smart San Diego (SDCWA), SoCal WaterSmart (Metropolitan Water District), and SDWD's free sprinkler nozzle program. (CAP Strategy 4: Precipitation Patterns and Water Supply)

4. WILDFIRE + SMOKE

Interagency Coordination

4-1 Coordinate with CAL FIRE, Encinitas Fire and Marine Safety Department, private landowners, and other responsible agencies to identify the best methods of fuel modification to reduce the severity of future wildfires, such as: prescribed fire, forest thinning, grazing, mechanical clearing, hand clearing, education, and defensible space. (CAP Strategy 1: Increased Wildfire Risk)

4-2 Work with relevant State agencies, including OES and CAL FIRE, to improve coordination for emergency services related to wildfire and related events in the City. Consider the development of a Community Wildfire Protection Plan to increase community resilience to wildfire events. (CAP Strategy 4: Increased Wildfire Risk)

Planning Tools

4-3 Continue to update the MJHMP every five years as required by the state to comprehensively plan for current and future wildfire risks within the City and work to implement all strategies in the City's current MJHMP. (CAP Strategy 2: Increased Wildfire Risk)

4-4 Adopt thresholds for restricting certain activities (e.g., outdoor sporting events, working outdoors) in accordance with Air Quality Index thresholds set under the California Department of Industrial Relations' Division of Occupational Health and Safety emergency regulation (July 2019) to protect workers from wildfire smoke.

Education and Outreach

4-5 Implement an alert system to warn residents of smoke hazards and inform them of actions they should take during an event (multiple languages, multiple media outlets).

4-6 Implement wildfire risk communication messaging that:

a. Occurs throughout the high wildfire risk season, so people know in advance how to use masks and air purifiers and where to get them.

b. Reaches non-English speaking individuals and those without cell phones. Educate people on the severity of smoke impacts using easy-to-understand, comparative risk language (e.g., equivalent to smoking a certain number of cigarettes a day) and publicize fresh air centers—both City-designated and informal ones like movie theatres.

4-7 Provide masks and air filters, with instructions on how to use them and information about their limitations, to the City's vulnerable populations. Develop a program for providing air filters at cost or a reduced cost.

Building and Environmental Design

4-8 Consider new development standards for City residents and businesses within the WUI, such as incorporating defensible space practices into landscape requirements for neighborhoods at increased risk of wildfire. Residential areas that should be considered for new standards include neighborhoods surrounding Lux Canyon, Saxony Canyon, the Manchester Preserve, and Escondido Creek. (CAP Strategy 5: Increased Wildfire Risk)

4-9 Support citywide tree planting efforts, as trees can settle particles in the air during wildfire-smoke episodes.

5. FLOODING – ONSHORE

Interagency Coordination

5-1 Coordinate with relevant agencies such as OES and the Encinitas Public Works Department to map and identify all critical facilities and infrastructure that may be compromised by increased

flood risk. The City should plan accordingly for upgrades, relocation of facilities and infrastructure or identify beach nourishment projects to better prepare for increased risk of flooding events. (CAP Strategy 2: Increased Flood Risk)

5-2 Coordinate with relevant agencies such as FEMA, OES, and the Encinitas Fire and Marine Safety Department to better plan and prepare emergency services required for flooding events, including evacuation, flood management, and recovery services. (CAP Strategy 3: Increased Flood Risk.

Planning and Engineering

5-3 Conduct a comprehensive assessment of all stormwater and wastewater infrastructure in the City and analyze how this infrastructure may be affected or compromised by an increased risk of flooding events. (CAP Strategy 1: Increased Flood Risk)

5-4 Continue local and regional ecosystem restoration efforts to increase climate resiliency for flooding events within the City. (CAP Strategy 4: Increased Flood Risk)

5-5 Establish plans to stage equipment (e.g., portable pumps) in strategic areas before a storm event.

Education and Outreach

5-6 Launch a consumer education campaign on flood insurance and flood preparedness. (MHMP Goal 7: Objective 7E)

Building and Environmental Design

5-7 Implement requirements for managing runoff from impervious surfaces using green infrastructure. Consider design modifications for infiltration-based green infrastructure in areas with shallow groundwater.

5-8 Limit or prohibit the use of fill to elevate structures.

5-9 Implement programs to encourage flood-proofing retrofits to existing buildings and redevelopment in flood-prone areas.

5-10 Implement requirements for flood-resistant designs:

a. Design structures with flood-resistant or flood-proof building materials to enable floodable designs (those that allow for a certain level of flooding with no or negligible damage).
b. Flood-Resistant Building Materials use flood-resistant or flood-proof building materials in construction or renovation to enable floodable designs.
c. Floodable Designs – require building designs (including the use of flood-resistant building materials) that allow for a certain level of flooding with no or negligible damage.

5-11 Continue to manage and implement Urban Greening for Stormwater Management Best Management Practices ad described in the City's BMP Design Manual – Chapter 7 Engineering Design Manual. As managed by the City's Stormwater Division and implemented.[139] C

6. COASTAL FLOODING AND BLUFF EROSION

Interagency Coordination

6-1 Coordinate with regional and local transportation agencies to ensure redundancy of high-use transportation corridors to allow for continued access and movement in the event of an emergency.

[139] The City's Stormwater Division manages the program while the City's Development Services Engineering Division implements to the program.

6-2 Coordinate with regional and local transit providers to ensure that transit services can continue to operate during and after extreme events by coordinating with regional transit providers to identify alternative routes and stops if the primary infrastructure is damaged or closed as a result of extreme events.

Planning and Engineering

6-3 Support and monitor ongoing analysis of sea-level rise data relevant to the City's planning efforts. Continue to incorporate the most up-to-date information on sea-level rise into relevant planning documents, including the Safety Element of the City's General Plan. (CAP Strategy 1: Coastal Erosion and Predicted Sea-Level Rise)

6-4 Continue to implement current efforts focused on beach nourishment, coastal bluff improvements and wetland restoration, prioritizing projects that will mitigate the impacts of sea-level rise, including coastal erosion and saltwater inundation. (CAP Strategy 4: Coastal Erosion and Predicted Sea-Level Rise)

6-5 Coordinate with relevant agencies, including FEMA and OES, to prepare and plan for the impacts of coastal erosion, sea-level rise, and coastal storm surge, continuously updating and utilizing the most relevant strategies and guidance provided by relevant agencies and institutions. (CAP Strategy 5: Coastal Erosion and Predicted Sea-Level Rise)

6-6 Continue to map critical infrastructure in the City that may be impacted by sea-level rise and work with City's Public Works Department to plan accordingly. (CAP Strategy 6: Coastal Erosion and Predicted Sea-Level Rise)

6-7 Incorporate sea-level rise effects into capital improvement plans.

6-8 Update maintenance protocols to incorporate projected climate change effects and evaluate the potential for increased frequency or need to maintain transportation infrastructure.

6-9 Consider the best available and most recent scientific information with respect to the effects of long-range sea-level rise when establishing sea-level rise maps, scenarios, signals, and decision points. The City shall also support scientific studies that increase and refine the body of knowledge regarding potential sea-level rise in Encinitas and possible responses to it. As necessary, policies related to sea-level rise should be reevaluated and modified.

6-10 Safeguard groundwater supply against contamination, degradation, or loss due to flooding or sea-level rise.

6-11 Revise zoning regulations to include provisions for reasonable interim uses for properties where the highest and best use allowed by zoning is not presently attainable due to natural hazards (including sea-level rise) and other factors. Examples of reasonable interim uses include contractor's yards, modular offices and storage, and outdoor recreation.

6-12 Consider implementation of additional Overlay Zones that superimpose additional regulations on an existing zone based upon special characteristics of that zone:

a. Sea Level Rise Zone – areas that will be inundated by sea-level rise (based on agreed upon models and scenarios).
b. Protection Zone – areas with critical infrastructure and dense urban development, where the locality will permit coastal armoring; local governments could require soft-armoring techniques to be employed where feasible.
c. Accommodation Zone – areas to allow new development but may limit the intensity and density of new development, limit hard shoreline armoring, and require that structures be designed or retrofitted to be more resilient to flood impacts.
d. Retreat Zone – areas prohibiting hard armoring will limit or prohibit rebuilding of damaged structures or require the removal or relocation of structures that become inundated.

e. Preserve Zone – areas to preserve and enhance important natural resources, ecosystems, habitats, or flood buffers.

6-13 Consider implementation of additional setbacks based upon special characteristics of the area:
   a. Fixed Mandatory Setbacks – require that all structures, including sea walls, be set back a specific distance from a predetermined point.
   b. Erosion-Based Setbacks – determined by a projected shoreline position that assumes a specific increase in sea level and erosion rates over a specific period, such as the life of the structure.
   c. Tiered Setbacks – require a lesser setback or buffer for smaller structures and a greater setback for larger structures that are more difficult to move if they become damaged and put more people at risk.
   d. Buffer Zones for Vulnerable Areas – areas of land separating two distinct land uses that softens or mitigates the effects of one land use on the other.

Building and Environmental Design

6-14 Require applications for hard shoreline protection projects to demonstrate that nature-based alternatives are unavailable or will not provide the desired protection. Applicants should submit engineering reports and analyses of a range of living shoreline protection strategies explaining why a living shoreline approach is infeasible at the project location.

6-15 Encourage natural or nature-based infrastructure using natural ecological systems or processes to reduce vulnerability to climate change-related hazards while increasing the long-term adaptive capacity of coastal areas by perpetuating or restoring ecosystem services. Examples include:
   a. Living Shorelines are any shoreline management system that is designed to protect or restore natural shoreline ecosystems through the use of natural elements and, if appropriate, manmade elements.
   b. Wetland Restoration that allows[s] tidal wetlands to proliferate in areas that have been diked or otherwise altered from their original conditions.
   c. Beach Nourishment/Replenishment to replace eroded sand or to protect against future erosion.
   d. Dune Management/Restoration using engineered projects to restore eroded dune systems.
   e. Sediment Management is a systems approach to deliberately manage sediments in a manner that maximizes natural and economic efficiencies to contribute to sustainable water resource projects, environments, and communities.

6-16 Maintain, repair, and raise shoreline structures.

6-17 Conduct a comprehensive assessment of shoreline structure conditions citywide to prioritize areas with deferred maintenance and other structural issues and identify ownership of each shoreline protection structure.

6-18 Establish and implement a new maintenance and repair plan for shoreline structures to reduce the amount of deferred maintenance. Focus maintenance and repair efforts on segments of the shoreline that could substantially deteriorate over time, exposing that area to overtopping and inundation if the structure fails.

6-19 Establish a strategy for addressing shoreline structures that are not owned by the City and consider adopting a policy that calls for the City to purchase the parcels when they become available.

Location-specific Sea Level Rise Adaptation Strategies

Beach Nourishment

Beach nourishment is a form of "soft" armoring that protects shorelines from erosion due to wave action and storm events by placing a replenishment of sand to increase a beach's seaward profile, length, height, and volume.

6-20 Sand supply for replenishment should be sourced by either dredging and pumping from an offshore donor site or by locating similar sediment at an upland site and transporting it to the nourishment location.

6-21 Implement a program where suitable soils excavated during private and public development projects can be used as a supply source. Said program shall also include a suitable location within the City's limits or in an area adjacent to the City, that has been deemed acceptable for purposes of storing this supply source.

6-22 Distribute the sand onto the beach or inland waterway system in a way that supports native conditions, littoral functions, recreation, and aesthetics.

Raise/Improve Seawalls

Seawalls are a form of "hard" armoring designed to reflect wave energy away from the property behind them. Seawalls are generally constructed of sheet piling (interlocking panels of metal, concrete, or other materials), driven far below grade (30 feet is typical), with a lesser portion extending above grade. Seawalls should be designed with the consideration of maintaining the existing natural coastal bluff aesthetic.

6-23 Seawalls should be used to buttress coastal bluffs with the dual purpose of protecting against wave action and supporting the bluff itself.

6-24 Design seawalls to brace near-vertical slopes and require the addition of embedded horizontal tiebacks with anchors covered with a natural bluff appearance

6-25 To slow damage from "scouring", a hard reinforcement material such as large cobble or revetment should be placed at the front of the toe to dissipate scouring energy.

Raise/Improve Revetments

Revetments are engineered slopes placed parallel to a waterline to attenuate wave energy and protect a shoreline. Large, angular rocks, concrete rubble, or gabions (large metal mesh containers filled with stone) are common revetment construction materials.

6-26 Raise or improve an existing revetment when it no longer provides sufficient protection against increasing storm surges or wave action. In these cases:

a. Additional rock, cobble, or other materials may be added to the existing revetment to fill voids or increase its volume or length.

6-27 Revetment design must maintain a certain degree of permeability, as they are known to speed erosion by impeding the natural migration of river deposits and other upland sediment sources from reaching the open beach.

6-28 Revetments should be constructed to have a life expectancy of 30-50 years.

Groins

Groins are linear hard structures that extend perpendicular from a beach into the open ocean and form simple, physical barriers that interrupt littoral drift (naturally occurring longshore sediment movement.) Typically made of boulders, groins can also be constructed with manufactured sheet piles, concrete rubble, or large timbers.

6-29 New groin construction should look at offshore geography, tide data, and local wave energy to determine the appropriate height, width, length, and void size to achieve the desired results.

6-30 Permeability should be balanced between too little (unacceptable loss of beach on the downdrift side) and too much (not enough accretion on the updrift side to be effective.)

6-31 Consider implementing groins in conjunction with additional adaptation strategies such as beach nourishment, to mitigate beach erosion.

6-32 Place groins adjacent to estuaries, bays, and navigation channels, groins prevent sediment from accumulating in these waterways.

Raise Structures

The goal of raising a structure is to elevate the lowest living area floor to be above known flood levels, allowing its continued occupation/use, while flood waters flow unimpeded beneath or around it.

6-33 Allow the raising of existing structures as a retrofitting method for flood adaptation.

Remove Structures

Removing a structure from its location is the purposeful vacation from a hazard area and allows erosion to occur without intervention.

6-34 Structures can be removed by demolition, or by relocating them to a new site.

b. Removal by demolition requires disposal of all debris, and disconnecting-capping gas, power, and water utilities. Earth-moving equipment is then used to backfill foundation or basement voids and re-grade the parcel.

7. LIQUEFACTION

Planning and Engineering

7-1 Design and implement Geological Hazard Abatement Districts (GHADs) to prevent, mitigate, abate, or control geologic hazards.

Building and Environmental Design

7-2 Promote retrofit efforts to reduce the impact of earthquakes and liquefaction. Explore incorporation of new requirements for new development and redevelopment permits to increase building resilience to liquefaction.

CONCLUSION

Adapting to a changing climate requires proactive planning to ensure protection of people, environmental resources and development. No single category of action(s) is considered “better”, or “best”, as different types of actions are appropriate for different locations and for different vulnerabilities and resource protection goals. Additionally, approaches can change over time depending on resources available as well as community goals and needs. In many instances, a hybrid approach to adaptation that utilizes actions across multiple categories is necessary to reduce vulnerability.

The effectiveness and ease of implementation for many actions are contingent upon decisions made around other actions. So, development and consideration of larger strategies (groups or series of actions) which can get implemented over space and time may be more effective and efficient. These larger strategies are ideally designed to be robust for the most likely future scenarios and/or can be modified or adjusted at key junctures in the future. It is essential to identify in advance how these changes would be implemented and when these changes would need to occur to help the City plan for, prioritize, and stagger investment.

Appendix C

Equity Gap Analysis

ENERGY POLICY INITIATIVES CENTER
UNIVERSITY OF SAN DIEGO SCHOOL OF LAW

TO: Crystal Najera, Sustainability Manager; City of Encinitas
Ryan Lamkin, Sustainability Management Analyst; City of Encinitas

FROM: Naomi Wentworth, Policy Analyst; Energy Policy Initiatives Center (EPIC) at University of San Diego
Yichao Gu, Senior Policy Analyst; Energy Policy Initiatives Center (EPIC) at University of San Diego

DATE: November 21, 2024

RE: Encinitas Climate Action Plan Update – Equity Considerations – Technical Memorandum

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The purpose of this memorandum is to provide the potential equity considerations associated with the City of Encinitas Climate Action Plan Update (CAP Update). The City of Encinitas has made progress in understanding racial and ethnic barriers in housing, addressing the growing homelessness problem, and bringing underrepresented community organizations into the planning process. However, there are gaps in equity planning that can be addressed during the implementation of the CAP Update. Demographic and socioeconomic factors were reviewed from the CalEnviroScreen tool as well as additional Census data to further inform on the city's unique community characteristics. The equity consideration proposed include ensuring continuous community involvement from underrepresented groups, bridging language barriers, working to alleviate issues experienced by cost and transportation burdened households, creating local green jobs and workforce training, and creating a climate adaptation implementation plan that prioritizes the most vulnerable communities.

1.0 Equity Work that City of Encinitas has Done to Date

Community Outreach:
The City has conducted outreach to various community groups during the CAP Update process to better understand equity concerns felt by the community. One business organization, three environmental organizations, and two underrepresented organizations responded to surveys out of the 24 organizations contacted for input. Primary equity concerns raised by the organizations are summarized in Table 1.

Table 1: Equity Concerns Raised by Community Organizations

Organization Type	Primary Equity Concerns
Business [6 organizations contacted, 1 interviewed]	• Climate change concern: flood and wildfire • Outsized burden on builders of new development; shift focus to existing building decarbonization • Increased requirements on new development in turn increase housing cost burden to residents
Environmental Groups [8 organizations contacted, 5 interviewed]	• Climate change concern: risk to biodiversity and beach assets through drought and sea level rise • Transportation and car dependance are equity issues • Transportation access and safety is not equitable in the city • Parking requirements reduce ability to develop bike and pedestrian friendly areas

	• Housing element sites should be placed in areas with alternative transportation routes and options • Land use and housing costs are too high and unequitable • Existing transit system is poor • Market-based, private flex fleet programs likely will not result in equitable access • Work regionally to ensure active transportation network extends beyond city boundaries • Fleet sharing programs also need truck access
Schools [2 organizations contacted, none interviewed]	No responses
Underrepresented [8 organizations contacted, 2 interviewed]	• Climate change concern: climate adaptation for homeless population • Energy transition accessibility to cost burdened individuals (energy, housing, seniors, renters) • Effect on native plant life • Need equity metric tracking • Concerned about senior population, communities in pollution zones, and low-income communities • Climate adaptation issues for renters (like high heat) • Concerns on language barrier for Spanish speaking population

Study of Racial and Ethnic Barriers in Housing:
The City contracted with Opportunity Consultant in 2023 to assess Barriers to Racial and Ethnic Equity in Housing within Encinitas, and incorporated recommendations into city planning initiatives including Climate Action Planning. Findings included:

- Encinitas' housing market is less racially and economically diverse than that of surrounding communities.
- Low-income and Black, Indigenous, and People of Color (BIPOC) residents are clustered in certain areas of the city.
- There are policies in place that create barriers to developing more multifamily units, including Proposition A.
- There is a shortage of affordable housing, and programs designed to promote affordability do not adequately serve community needs.
- There is a limited amount of affordable housing in Encinitas, and the locations of affordable housing exacerbate existing inequities.
- Limited public transit constrains affordable and accessible housing development.
- Private sector practices and incentives contribute to displacement.

Addressing Homelessness:
The City began a Homeless Outreach Program in June 2022 to provide support, resources, and services to individuals experiencing homelessness. Additionally, the City houses a Safe Parking Program for those living out of their cars and has staff dedicated to working on solutions to homelessness.

2.0 Population Characteristics: Socioeconomic Factor Indicators

The following socioeconomic indicator categories were pulled from CalEnviroScreen 4.0[1] with factors updated using the latest data available, as described in Table 2. CalEnviroscreen is widely used as a tool to understand equity issues in communities across California.

Table 2: CalEnviroScreen Demographic Indicators

Indicator Type	Definition	Metric	Metric Source
Educational Attainment Socioeconomic Indicators	Percentage of the population over age 25 with less than a high school education (5-year estimate, 2015-2019).	10.2%	2023 ACS: S1501 Educational Attainment
Housing-Burdened Low-Income Households Socioeconomic Indicators	Percent of households that are both low income (making less than 80% of the HUD Area Median Family Income) and severely burdened by housing costs (paying greater than 50% of their income to housing costs).	13.3% (15.9% spend over 50% of their income on housing, 37.4% make under 80% HUD area median income)	Comprehensive Housing Affordability Strategy, HUD's Office of Policy Development and Research, ACS 2017 - 2021
Linguistic Isolation Socioeconomic Indicators	Percentage of limited English-speaking households	2.3%	2022 ACS: S1602 Limited English-Speaking Households
Poverty Socioeconomic Indicators	Percent of the population living below two times the federal poverty level	17.0%	2023 ACS: K201702 Ratio of Income to Poverty Level in the Past 12 Months
Unemployment Socioeconomic Indicators	Percentage of the population over the age of 16 that is unemployed and eligible for the labor force	2.9%	2022 ACS: DP03 Selected Economic Characteristics

The CalEnviroScreen tool primarily focuses on pollution burden and health impacts. While important indicators, for a small coastal community like Encinitas that experiences significantly less pollution and health burdens than other areas in California, we recommend broadening the socioeconomic indicators to include those included in Table 3 and Figure 1. The indicators in Table 3 include vulnerable populations mentioned in the interviews with community organizations (Table 1) with the best available data to contextualize the issue.

[1] CalEnviroScreen 4.0 is the latest iteration of the California Communities Environmental Health Screening Tool. The original and subsequent versions were developed by the Office of Environmental Health Hazard Assessment, or OEHHA, an office within the California Environmental Protection Agency. Documentation: https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf

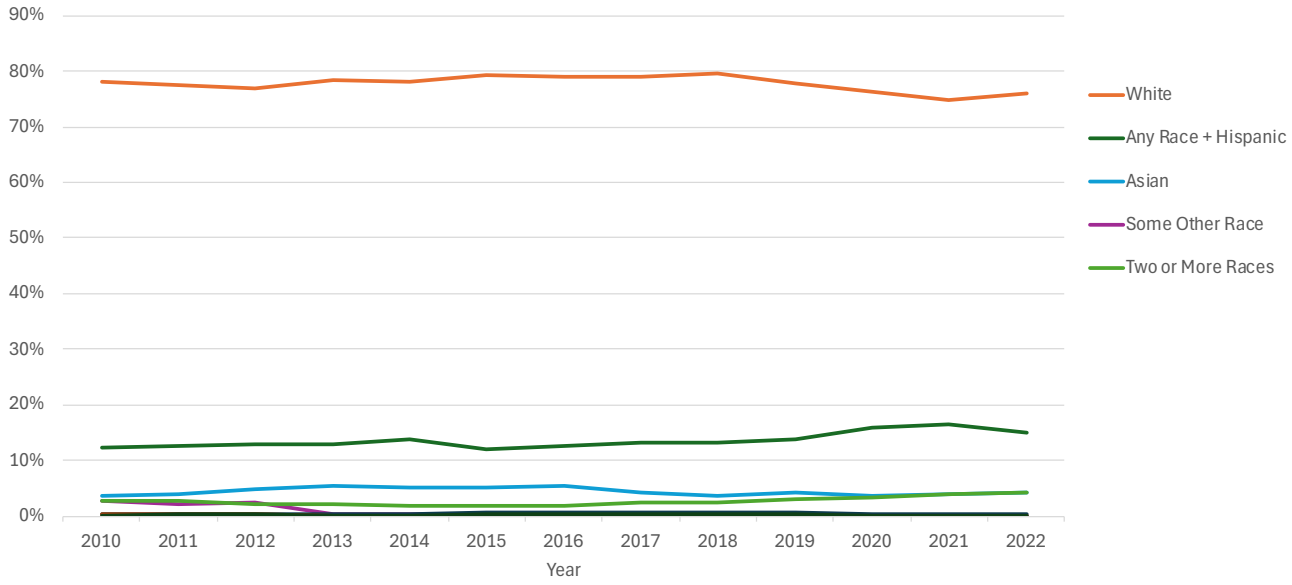
Table 3: Additional Recommended Demographic Indicators

Vulnerable Populations	Metric	Metric Source
Population over 65 years old	24%	Census ASC 2022
Population with a disability	9%	Census ASC 2022
Householders living alone	23%	Census ASC 2022
Households with a child under 18 and no spouse	8%	Census ASC 2022
Population without health coverage	3.7%	Census ASC 2022
Percent of population, over 18 years old, with self care difficulties	1.8%	LiveWell San Diego Database, 2022[2]
Percent of population who is primary caregiver	5.4%	LiveWell San Diego Database, 2022[2]
Unsheltered Population – 2024	123	San Diego Regional Task Force on Homelessness (RTFH), 2024 Point in Time Count[3]
Unsheltered Population – 2022	76	San Diego RTFH[3]
Unsheltered Population – 2020	47	San Diego RTFH[3]
Experience Communication Isolation		
Do not speak English at home	16%	Census ASC 2022
Speak limited English at home	2.3%	Census ACS 2022
Speak little to no English	1%	Census ASC 2022
Without internet or a computer	2%	Census ASC 2022
Cost Burdened – Renters		
Population that rents their residence	31%	Census ASC 2022
Renters who spend over 30% of their household income on rent	50%	Census ASC 2022
Median gross rent	$2,861	Census ASC 2022
Cost Burdened – Homeowners		
Population that lives in an owner-occupied residence with a mortgage	40%	Census ASC 2022
Households that spend over 30% of household income on housing costs	37%	Census ASC 2022
Median housing costs for residences with a mortgage	Over $4,000	Census ASC 2022
Transportation Burdened		
Percent of households with no vehicle available	3.8%	Census ASC 2022
Percent of the Populations with Travel Time to work over 60 mins	4.7%	LiveWell San Diego Database, 2022[2]
Percent of the population using public transportation to work.	0.7%	LiveWell San Diego Database, 2022[2]
Access to Community Spaces		

[2] Live Well San Diego Database, County of San Diego Equity Indicators. https://data.sandiegocounty.gov/browse
[3]San Diego Regional Leader on Homelessness Annual Point in Time Count. https://www.rtfhsd.org/reports-data/

Vulnerable Populations	Metric	Metric Source
Percent of households that meet the minimum level of service (within 0.25 miles and >= 300 sq.ft/du of community spaces).	49.2%	LiveWell San Diego Database, 2022[2]
Percent of the population living within 0.25 miles of a park or community space.	58.6%	LiveWell San Diego Database, 2022[2]

Figure 1: Racial Diversity of City of Encinitas from 2010 - 2022



Census, American Community Survey 2022

3.0 Considerations for Further Aligning Climate Action and Equity

The following items are recommended considerations to integrate equity into the City's CAP Update:

1. **Ensure Continuous Community Representation:** Build on the community outreach work done to date by establishing community climate advisory boards or task forces from various community stakeholder groups including vulnerable and underrepresented communities.
2. **Bridge the Language Barrier:** Develop a policy to ensure all CAP outreach is conducted in Spanish and English.
3. **Expand Climate Vulnerability Assessments to View from an Equity Lense:** As impacts from climate change start to affect the population, the City should incorporate equity considerations into the current Climate Adaptation chapter of the CAP. To incorporate equity into the existing plan would entail completing a community sensitivity analysis to the impacts of climate change (which populations are most at risk for first and worst impacts of climate change) and creating an equitable plan to adapt to those issues.
4. **Target Climate Adaptation Investments Equitably:** Direct funding to flood-prone or heat-vulnerable neighborhoods and ensure these areas and vulnerable populations within those areas receive priority access.

5. **Train Workforce for Increased Green Jobs:** Create or participate in a plan to develop a local workforce for climate transition jobs. As an example, this would include: EV charging installation and maintenance jobs, solar and microgrid installation and maintenance jobs, native plant and tree maintenance, etc.
6. **Alleviate Issues Experienced by Cost Burdened Households:** Conduct outreach on the City's plans to increase residential development in an effort to reduce housing costs in Encinitas. Prioritize funding for programs that improve the energy efficiency of homes in lower-income and cost-burdened neighborhoods through CAP Update measure BD-1: Require Existing Residential Energy Efficiency. Additionally, implement recommendations from *Barriers to Racial and Ethnic Equity in Housing* study to remove systemic barriers to community diversity.
7. **Alleviate Issues Experienced by Transportation Burdened Households:** Ensure local flexible fleet program is developed with equitable access to flexible fleet options, with focus on neighborhood access and rate design. Additionally, prioritize Active Transportation Plan implementation to ensure safe bike and pedestrian access to the most underserved areas first.
8. **Track Equity Indicators:** In addition to tracking the process of each CAP measure, use metrics to measure the impact of climate initiatives on different demographic groups, tracking indicators like economic benefits, health outcomes, and adaptation improvements in vulnerable areas. Publish these results to the Climate Dashboard.

Appendix D

Public Outreach and Engagement Plan

Outreach and Engagement Plan

for the

City of Encinitas

Climate Action Plan Update

Final

December 2023

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1 INTRODUCTION

In March of 2011, the City of Encinitas (City) adopted its first-ever Climate Action Plan (CAP). A CAP provides a comprehensive roadmap to address the challenges of climate change within a jurisdiction, primarily through reducing greenhouse gas (GHG) emissions and supporting the community to adapt and build resilience to the impacts of climate change. In January of 2018, the Encinitas City Council approved a comprehensive update to its CAP, which describes how GHG emissions within the city will be reduced in accordance with statewide targets through the implementation of GHG reduction measures. The CAP was revised again in November of 2020 to address increased growth as a result of the City's recently approved Housing Element and incorporate anticipated mobility projects identified in the *City of Encinitas Active Transportation Plan*. The City is now preparing another comprehensive update to its CAP to fulfill its commitment to update the document every five years. This update is intended to build on past successes and provide any necessary revisions, adding or modifying targets, goals, and/or measures to reflect current technologies, policies, and government mandates. Specifically, this CAP update will:

- Evaluate Existing GHG Reduction Targets – Evaluate the City's existing GHG reduction targets to determine whether it would be necessary to update overall emissions targets and whether additional GHG reduction measures would be needed to reach an updated target.
- Identify CAP Measures – Identify candidate measures to reduce or remove emissions based upon early public input and a review of CAPs in the region and around the state. This will include a review of existing CAP measures to determine if any revisions are needed based on the current implementation process and the impact of latest regulations.
- Estimate GHG Impacts of CAP Measures – Estimate the GHG reduction potential of each candidate measure based on previous work in the region and using relevant and appropriate methodologies.
- Complete an Implementation Cost Analysis on Draft CAP Measures – Estimate the implementation costs of draft CAP measures.
- Select Final CAP Measures – Evaluate and select candidate measures to be incorporated into the CAP update based on estimated GHG reduction potential, results of the implementation cost analysis, potential co-benefits, implementation feasibility, and stakeholder and community feedback.
- Integrate Social Equity Considerations – Support integration of social equity throughout the updated CAP.
- Develop CAP Implementation Monitoring Procedures – Evaluate and ensure that monitoring activities are consistent with relevant and appropriate guidance (e.g., the Regional Climate Action Planning Framework [ReCAP]), which includes determining what aspects of existing monitoring efforts could be refined or expanded upon.

The City recognizes the importance of community outreach and engagement as part of the planning and development process for the CAP update. This Outreach and Engagement Plan (Plan) summarizes the strategies to engage the community and other interested parties in the preparation of a successful CAP update, along with the associated California Environmental Quality Act (CEQA) document. The purpose,

goals and guiding principles for public engagement and outreach are described below, followed by a summary of specific outreach methods to be used during the climate action planning process. The outreach and engagement program may evolve and change from that published in the Final Plan at the City's discretion to meet the CAP program needs and accommodate varying circumstances.

1.1 PURPOSE

The purpose of this Plan is to ensure that the public and stakeholders have meaningful opportunities to provide input throughout the development of the CAP update. The outreach strategies and activities presented in the Plan are intended to provide local community members, stakeholders, interested parties, and other affected agencies and/or individuals with opportunities to become actively involved throughout the planning process. The outreach program in this Plan will assist the City in both providing timely information to and receiving input from interested parties during the development of the CAP update and CEQA document. It should be noted that the Plan is subject to change throughout the process of preparing the CAP update. Changes and modifications may be necessary to reflect project progress, changes in the project schedule, modifications to adapt to public health and safety needs, and to adjust tools and techniques based on their effectiveness as the City conducts public participation activities for the CAP update.

1.2 GOALS AND GUIDING PRINCIPLES

The goals of outreach and engagement are to: (1) involve interested and affected parties in identifying needs, priorities, and values related to the CAP update; (2) create an effective and meaningful outreach process where all members of the community, including those that are often underrepresented in traditional public engagement processes, can participate; (3) build a shared commitment and buy-in across decision makers, the public and stakeholders, and internal City departments; (4) share the purpose, need, and benefits of updating the CAP; (5) promote broad-based understanding of the components of the updated CAP and expand the public's awareness of GHG reduction strategies, policies, and best practices; (6) highlight the importance of complying with relevant laws and regulations and their role in shaping the updated CAP; and (7) provide transparency in the methodologies and approaches for technical analyses that support the CAP update. The rationale for each of these goals includes the following guiding principles, which have been developed to further articulate the purpose of the Plan:

- Awareness – The public and stakeholders must be aware of the planning process before they are able to participate.
- Education – Informing the public and stakeholders about the CAP update, relevant laws and regulations, and the planning process is important for effective participation.
- Input – Individual knowledge and collective perspectives from the public and stakeholders can help the City better understand issues and challenges that face the community.
- Equity – Building capacity and empowering the public and stakeholders to be engaged in the process allows for more equitable outcomes and effective implementation.

- Open and public process – Having a clear process by which the public and stakeholders can participate, review, and provide feedback during the planning process will result in a CAP update that better reflects community priorities.

1.3 PREVIOUS ENGAGEMENT

During the process of developing the City's existing CAP, which was adopted by City Council in January 2018 and revised in November 2020, the City engaged the public and stakeholders through a series of community workshops, public meetings, Environmental Commission and City Council meetings, and through a "CAP Workgroup," which consisted of City staff representatives from various departments, including the City Manager's Office, Development Services, Public Works, Human Resources, Information Technology, Finance, and others. Additionally, other information-sharing tools, such as press releases, electronic mail notifications, and a project website, were utilized to keep the public and stakeholders informed. These outreach activities served to educate community members and encouraged their feedback and participation in the public process.

2 EQUITY FRAMEWORK

Equity is a primary focus of this Plan. The ongoing participation from individuals and groups that are often underrepresented in planning processes is critical to the City's process for updating the CAP. As identified by the *California Adaptation Planning Guide*, prepared by the California Governor's Office of Emergency Services in June 2020, there are three ways to incorporate equity into the planning process: procedural, distributional, and structural.

- Procedural equity focuses on increasing opportunities for engagement and ownership in decision-making, in all aspects of climate action planning, by the communities that are disproportionately impacted by and most vulnerable to climate change.
- Distributional equity is about fair distribution of resources, benefits, and burdens that result from climate action planning decisions. Distributional equity means prioritizing the allocation of finite resources and designing planning strategies to benefit communities that experience the greatest climate and environmental inequities and have the most unmet environmental health needs, while also ensuring that these communities do not disproportionately experience economic, social, or environmental burdens because of such planning decisions.
- Structural equity involves making planning decisions that recognize and address the underlying structural and institutional systems that are at the root of economic, social, and racial inequities. It is an approach to decision making that overtly seeks to correct past harms and to anticipate and prevent future unintended consequences for disadvantaged social and racial groups. An approach based on structural equity examines whether planning decisions to achieve climate resilience also eliminate poverty, create workforce development opportunities, address racism, increase civic participation and social cohesion, protect housing availability and affordability, increase educational outcomes, and improve public health outcomes.

Procedural equity is a focus of this Plan, which is about creating outreach, engagement, and participation processes that are transparent, fair, and inclusive. In addition, the City will provide opportunities for the public and stakeholders to provide input related to distributional and structural equity that can shape GHG emission reduction measures and priorities.

2.1 VULNERABLE AND UNDERREPRESENTED POPULATIONS

Increasing opportunities for participation and ownership in community planning and decision-making for vulnerable communities is essential for creating an outreach and engagement process that is transparent, fair, and inclusive for those who are disproportionately impacted by, and most vulnerable to, climate change. It is also important to make a deliberate effort to engage individuals and groups that are typically underrepresented in the planning process and to address the many barriers to participation. Strategies to advance equitable participation should occur as part of all outreach and engagement activities conducted as part of the City's CAP update, and the following subsections provide an overview of the vulnerable communities and underrepresented groups that should be prioritized.

2.1.1 Vulnerable Communities

It is important to consider communities that may be more vulnerable to the impacts of climate change in Encinitas. Some of the vulnerable communities identified in the California Adaptation Planning Guide include:

- Chronically ill persons, including those with compromised immune systems.
- Foster children.
- Incarcerated persons.
- Linguistically isolated persons.
- Low-income persons.
- Persons experiencing homelessness.
- Persons with disabilities.
- Persons working outdoors.
- Renters.
- Senior citizens, especially those living alone.

This list is provided as a starting point for different groups to consider, but vulnerable communities may not be limited to these groups. Additional special needs groups that may overlap with vulnerable communities, as identified in *Appendix B: Housing Profile Report* of Encinitas' Sixth Cycle Housing Element (2021-2029) include students, migrant day laborers, and large households.

2.1.2 Underrepresented Groups

Underrepresented groups include groups that represent or are connected to communities that are typically underrepresented in the planning process, often due to one or multiple barriers to participation. Targeted

outreach efforts and partnerships with groups such as faith-based organizations, cultural and ethnic organizations, neighborhood action groups, community development organizations, providers of homeless services, and other groups is often necessary to drive participation of underrepresented groups. Underrepresented groups to consider include:

- Youth.
- Black, indigenous and people of color (BIPOC).
- Lesbian, gay, bisexual, transgender, queer or questioning, intersex, asexual, and more (LGBTQIA+) people.
- Refugees/immigrant communities.
- Tribal/Indigenous groups.
- Low-income households in vulnerable communities.

2.2 RECOMMENDATIONS TO CONSIDER

It should be noted that deliberate efforts to advance equitable participation and engage vulnerable communities and underrepresented populations do not necessarily equate to success. Certain groups are intrinsically more difficult to reach for a variety of factors, and it is not the expectation that the planning process for this CAP update will overcome all barriers to success. However, well-intentioned efforts will be made as steps towards these outcomes. Some recommendations that will be considered to engage and advance equitable participation include:

- Geographic targeting. According to the State's DAC Mapping Tool[1], there are a couple Census Block Groups that are classified as disadvantaged communities in Encinitas. The City has also applied for a grant to conduct a Climate Equity Study. Results from the study, and tools (such as the DAC Mapping Tool) could be used to identify geographic areas in the city that could benefit most from targeted outreach and engagement opportunities.
- Engage other partners. Partnerships with community organizations can help create connections and build essential relationships with underrepresented individuals and groups and reach vulnerable communities. Targeted outreach efforts to specific groups are also necessary to connect with underrepresented individuals and groups.
- Make participation convenient. Offer multiple opportunities for people to participate at different times and locations, using different tools to encourage more participation.
- Accessibility. Increase the accessibility of events, workshops, and virtual meetings by offering accommodations such as closed captioning and/or interpretative services for non-English speakers.

[1] https://gis.water.ca.gov/app/dacs/

3 GENERAL OUTREACH INFORMATION

To ensure broad and comprehensive outreach to the public and interested stakeholders, this Plan includes several components and efforts that will support the overall process, including the designated outreach/engagement coordinator, a summary of the media strategies and the appropriate contact, and how this process will be integrated with the CAP update and other planning processes. Each component or effort is briefly described below.

3.1 OUTREACH/ENGAGEMENT COORDINATOR

The role of the Outreach/Engagement Coordinator will be to serve as a central contact for the public and stakeholders for the CAP update and CEQA document. For this project, the Outreach/Engagement Coordinator is also the Sustainability Manager. The Outreach/Engagement Coordinator will participate in and help coordinate all facets of the implementation of this Plan for the CAP update and CEQA document. Anyone seeking information on the CAP update or CEQA document should contact:

Crystal Najera
Sustainability Manager
City of Encinitas
505 S Vulcan Ave, Encinitas CA 92024
Phone: 760.943.2285
Email: cnajera@encinitasca.gov

3.2 MEDIA STRATEGIES

The City will actively engage and alert appropriate media outlets with project updates at applicable milestones throughout the CAP update and CEQA process. Press releases will be circulated to announce public workshops and hearings, and the City will work with local media outlets and encourage them to follow the planning process and include features in local publications. Media strategies will be led by the Outreach/Engagement Coordinator (i.e., Sustainability Manager) and supported by the planning team. Media inquiries should be addressed to the contact listed in Section 3.1.

3.3 SYNCHRONIZATION OF OUTREACH WITH PLANNING MILESTONES

The City is committed to listening and demonstrating responsiveness to the community's input at each step in the planning process. As technical information and draft recommendations are available, they will be discussed with the public and other interested parties and presented on the City's website. Key information will also be discussed at public workshops prior to the release of the draft updated CAP to allow participants to provide input and feedback. This input and feedback will be synthesized and used to guide the final recommendations in the CAP update.

Outreach for the CAP update and CEQA document will be conducted consistent with the overall goals of the City, via the *2023-24 Strategic Planning Framework*[2]. This framework includes six elements that represent the vital areas of focus for the City: (1) Environmental Health and Leadership; (2) Engagement and Education; (3) Mobility and Alternate Modes; (4) Fiscal Stewardship and Effective City Services; (5) Housing and Affordability; and (6) Evolving and Preserving Community Character. Together, these elements and their associated goals are intended to ensure that the City's five unique communities (i.e., New Encinitas, Old Encinitas, Cardiff-by-the-Sea, Olivenhain, and Leucadia) can collectively thrive.

4 PHASES AND SCHEDULE FOR PUBLIC ENGAGEMENT AND OUTREACH

This Plan for the City's CAP update is structured into six phases. Each phase of the process highlights opportunities to participate at key milestones to maximize the participation of the public and stakeholders. In addition, the City will actively communicate and conduct outreach to the community throughout the process. The various outreach and engagement activities proposed in relation to each of the six major phases and milestones for the CAP are described below and depicted in Figure 1. It should also be noted that the City is open to receiving public and stakeholder input at any point throughout the entire CAP planning process (which is also visually represented in Figure 1).

1. Project Initiation (Late 2023): The initial phase includes starting the City's process of updating the CAP, including beginning to develop social equity objectives for the CAP, and developing an outreach and engagement plan to increase awareness and familiarity with the purpose, objectives, and process for preparing the CAP update.
2. Inventory, Projections and Targets (Late 2023–Early 2024): The next phase will evaluate the City's existing CAP GHG reduction measures to determine whether they are outdated, need to be or can be revised, and get community input that will inform the development of GHG reduction measures. The City will also discuss the latest inventory, share a projection of future GHG emissions, and discuss GHG reduction targets as set by the state (i.e., 2030, 2045). Anticipated major participation opportunities during this phase include Public Workshop #1 and a meeting with the Environmental Commission.
3. Emissions Reduction Measures (Early–Mid 2024): This phase will include preparing a list of additional candidate emission reduction measures for the CAP update, estimating the GHG impacts of the measures, and completing an implementation cost analysis of the list of candidate measures under consideration. Anticipated major participation opportunities during this phase include Public Workshop #2 and an online survey, as well as a public meeting of the Environmental Commission to get early input.
4. Draft CAP and Draft CEQA Document (Mid 2024): A Draft CAP will provide an updated CAP document that builds on work during previous phases and packages it in a single document for public review. As part of this phase, the Draft CEQA document will be prepared. Anticipated major participation opportunities during this phase include Public Workshop #3 and during public hearings of the Environmental Commission and City Council. Public hearings could take the form of a presentation and

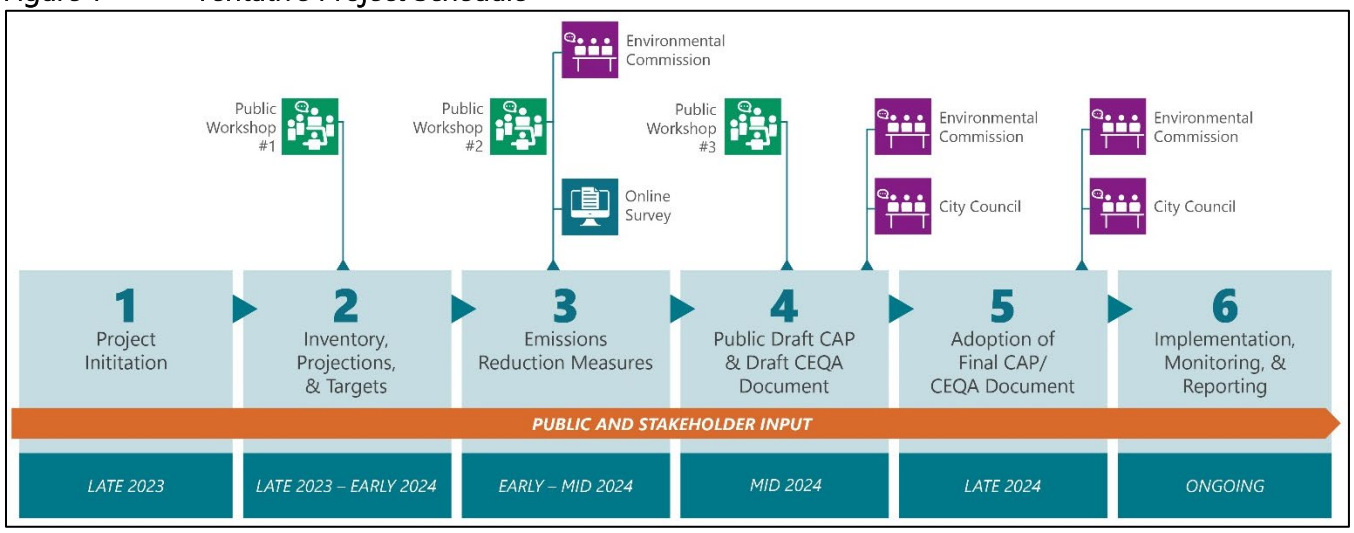
[2] https://www.encinitasca.gov/government/annual-reports/2023-24-strategic-planning-framework

an informational item, or can be structured workshop discussions; however, no official actions from these bodies are required during this phase.

5. Adoption of Final CAP and CEQA Document (Late 2024): After public review, revisions may be made to the CAP to prepare a Final CAP that will be brought forward for adoption by the City Council along with a Final CEQA document. Anticipated major participation opportunities during this phase include meetings by the Environmental Commission, and a hearing of the City Council to consider the CAP update for adoption.

6. Implementation, Monitoring, and Reporting (Ongoing): Monitoring and reporting are critical components of the climate action planning process. Performing monitoring on a regular basis and reporting the results in a clear manner will allow the City to evaluate progress toward achieving its reduction targets, revise and update reduction measures based on past performance, and regularly reassess emissions projections. Implementation and monitoring procedures will be created during the CAP development process and will measure the effectiveness of different GHG reduction measures. The City already has a Climate Dashboard[3] that has been used to monitor progress since the latest version of the CAP, which may be used and built upon for this CAP update.

Figure 1 Tentative Project Schedule



Source: Developed by Ascent in 2023.

5 OUTREACH AND ENGAGEMENT ACTIVITIES

The following engagement activities (listed in Section 5.1) will be used by the City at key milestones in the CAP update process. In addition, the City may conduct other ongoing outreach activities throughout the planning process for the CAP update, which are also described (in Section 5.2).

[3] https://www.encinitasenvironment.org/dashboard

5.1 PUBLIC ENGAGEMENT ACTIVITIES

Broader engagement activities are intended to maximize participation of the public and stakeholders, while also including traditionally underrepresented groups. The following broader engagement activities will occur during various phases of the project.

5.1.1 Public Workshop #1

PURPOSE

The objectives of Public Workshop #1 are to foster a clear understanding of why the City is preparing a CAP update, present the GHG inventory and forecasts, highlight the gap in emissions reductions needed to achieve targets, and present preliminary GHG reduction measures to meet these targets. Public Workshop #1 will also serve as an opportunity to get feedback on social equity objectives for the CAP. Feedback and comments received at the workshop will be reviewed and used to refine the preliminary list of GHG reduction measures for the City.

TIMING

Public Workshop #1 is expected to occur on January 30, 2024, as an in-person workshop with Ascent's attendance.

5.1.2 Public Workshop #2

PURPOSE

The purpose of Public Workshop #2 is to present the list of candidate GHG reduction measures and the results from an implementation cost analysis of measures and receive feedback from the public.

TIMING

Public Workshop #2 is expected to occur in mid-2024.

5.1.3 Public Workshop #3

PURPOSE

Public Workshop #3 will be aligned with the public review period of the Draft CAP. The objectives of this workshop are to share the contents of the Draft CAP and provide the public an opportunity to provide comments before it is presented to the City Council for adoption.

TIMING

Public Workshop #3 is expected to occur in mid-to-late 2024.

5.1.4 Online Survey

PURPOSE

The purpose of the online survey is to gather information and feedback from the public on the candidate GHG emission reduction measures, as well as assess individual understanding about the CAP. The survey results will supplement feedback from Workshop #2 and will be used to inform the development of the final list of GHG emission reduction measures to be included in the Draft CAP.

TIMING

The survey will be developed and issued in mid-2024, as part of a coordinated effort with Public Workshop #2.

5.2 COMMUNITY EVENTS

Adding a table at an existing community event can create an opportunity to engage the general public and reach a broader audience and can help leverage events that are already planned in Encinitas. City staff will seek out a variety of community events that can serve as an opportunity to engage the general public, especially events that have a connection to the CAP update, such as EcoFest, Arbor Day, farmers markets, and other community events.

TIMING

As needed from project initiation until Public Workshop #2, and at strategic events after that.

5.3 COMMISSION AND COUNCIL MEETINGS

5.3.1 Project Updates

PURPOSE

City staff will update, at a minimum, the Environmental Commission, Planning Commission, and City Council throughout the CAP process. Topics could include reporting on the GHG emissions inventory, reduction targets, stakeholder input, and progress on schedule. The update will be an agendized informational item provided during a regularly scheduled public meeting. Attendance at other commissions may also be considered, as warranted.

TIMING

Presentations will occur at the Environmental Commission, Planning Commission, and City Council meetings coincident with the major milestones of the CAP update process.

5.3.2 Adoption Hearings

PURPOSE

At least one public meeting is anticipated to occur with the Environmental Commission to seek a formal recommendation to adopt the CAP update to the City Council. The City Council will hold a public hearing to consider the Final CAP and CEQA document for adoption.

TIMING

Environmental Commission meetings and City Council hearings will be held as part of the adoption of the CAP.

5.4 INTERNAL COLLABORATION

Internal collaboration is also important to gain feedback on current operational procedures influencing the City's communitywide and municipal GHG emissions, potential reduction strategies, as well as to build a shared commitment and buy-in to emissions reduction measures across City departments. Internal collaboration will allow internal stakeholders to provide feedback on factors influencing the City's GHG emissions, implementation strategies, suggest additional strategies, and help identify strategies that should be prioritized. Regular internal collaboration will be conducted at key points in the process of updating the CAP through the City's already established CAP Workgroup which is an interdepartmental team with representation from all City departments that play a role in implementing the City's CAP. Collaboration will occur both during the City's internal CAP Workgroup meetings, as a group over email, and directly with individual staff, as needed, as the CAP update is developed.

5.5 PUBLIC OUTREACH ACTIVITIES

The City uses a variety of platforms to share information and can use these to get the word out about the City's CAP update and to announce opportunities for public engagement. Aside from a dedicated project website, the City may use electronic mail notifications, social media, the City Newsletter, the Environment Newsletter, blog posts, and press releases to share information with the public and stakeholders.

PROJECT WEBSITE

The City maintains a project webpage on the City's website, which is a highly visible and used as an asset the City has to communicate with its audiences. The project webpage for the CAP will continually be updated to include the latest information, share presentations, technical reports, and announce opportunities to provide public input and project milestones. Project communications and materials should also clearly direct people to the project website.

ELECTRONIC MAIL NOTIFICATIONS

An electronic mail (email) list will be used to notify interested parties of upcoming events and new materials posted on the project website. Persons will be added to the mailing list throughout the CAP and CEQA process and may sign up by visiting this City webpage: https://www.encinitasca.gov/i-want-to/register-for/city-updates and signing up for "Climate Action Plan" updates or sending a request to the Sustainability Manager at cnajera@encinitasca.gov.

SOCIAL MEDIA

Using a variety of platforms enables the City to communicate to multiple audiences. The City is active on Instagram, Facebook, Twitter, YouTube, LinkedIn, and TikTok, and has built a following on these platforms, which can be leveraged to convey important information related to the CAP update.

CITY NEWSLETTER AND ENVIRONMENT NEWSLETTER

The existing City Newsletter and Encinitas Environment Newsletter will be used by the City to keep stakeholders and the public informed about the CAP update. The City Newsletter is sent out weekly and the Environment Newsletter is sent out periodically, as important sustainably-focused news is available. Each newsletter is sent to anyone who signed up to receive them. Persons can be added to the newsletter mailing list by visiting this City webpage (https://www.encinitasca.gov/i-want-to/register-for/city-updates) and signing up for "Climate Action Plan" or "City Newsletter" updates.

PRESS RELEASES

The City will issue press releases to announce opportunities for public participation and promote key project milestones. Press releases are used to reach local media and can help share information with the public and stakeholders.

Appendix E

Summary of Public Input on
CAP Update

Stakeholder Interviews

San Diego 350

Tuesday, June 18th, 2024, 2pm

Virtual Teams Meeting

Attendees

Ryan Lamkin, City of Encinitas
Ann F., San Diego 350
Anne S., San Diego 350
Wendy M., San Diego 350
Kelly L., San Diego 350

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Is there any resiliency centers included within the CAP?

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

Will the implementation plan outline milestones to keep the City on track? The City should do more.

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

Strengthen reach codes with new building code cycle. Require AC/furnace replacements to be heat pumps. Commercial building benchmarking should be lower than 50k sq ft. Building performance standards policy

5. Are there any equity issues you think the City should be aware of when updating the CAP?

The City should leverage the new County CAP equity framework. Metrics should be used to measure the success in addressing climate equity. The County regional decarbonization framework includes equity considerations/implications. The City should consider creating a Climate Equity Index which will define and characterize communities of concern. The index would also help to prioritize CAP projects. Communities of concern include seniors, over polluted communities, low-income communities. Identify and build relationships with CBOs to better connect with communities of concerns. Community health groups, and churches are other CBOs to consider. Encourage these organizations to apply for community grants instead of waiting for the city.

Encourage/require AC in rentals and consider incentives. Offer stipend for communities of concerns too participate in CAP dialog. Spanish translation should be done for written materials and workshops. How can the City do more outreach to help communities of concern reach state and federal grants? SDCP's website has many resources for grants, rebates and equitable energy. In the case where Encinitas has funds, set aside incentives for a percent of low-income communities.

6. Any other questions or comments?

SanDiego350 is a grassroots, volunteer-based organization. Encinitas language includes major remodels and renovations. We should have those require solar panels in the new CAP. The building codes requirement for solar is only enough to power about half of a homes energy needs. Explain further flexible fleet. The City should explore a PPA/energy service company (ESCO) to install solar at municipal facilities. The City of San Diego is doing so to install solar and decarbonize buildings. Consider SD Learn which does customizable building decarbonization. Instead of just referring to GHG emissions, use other statistics to communicate reductions. Seek opportunities for regional collaboration. Consider open ending questions vs. Multiple choice for getting information.

Homeowner Requested Interview

Thursday, May 16th, 2024, 2pm

Encinitas City Hall

Attendees

Ryan Lamkin, City of Encinitas	Judy B.,
Crystal Najera, City of Encinitas	Dadla B.

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Pass

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

No

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

The largest problem for green building is that the public doesn't understand what it is, and contractors are confused by changing regulations. How can we get the public to want to upgrade their buildings to be green. Reach people even before they hire an architect. Host events for people to learn about how they can upgrade their homes to be energy efficient and decarbonized. Try to sell home performance through demonstrations, videos, etc. We should name strategy one to 'Building Efficiency & Decarbonization.' Efficiency is the first level, because dumping in clean energy is still wasteful. Add energy efficiency to the 'decarbonizing existing buildings' measure. Take a holistic approach of lowering the energy consumption. There should be an ordinance about how large HVAC and other energy systems should be to ensure there isn't energy waste. See how we can tie in energy efficiency into existing remodels and permits. Create energy efficiency consideration handout that must be signed before moving forward with a permit. Consider battery requirements for residential and commercial solar installation and change from 'solar' to 'microgrid.' Consider solar installation for remodels. Work with SDCP to lease roof space for solar.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

6. Any other questions or comments?

Research Green Genie and BayREN. What can we do to advance solar installation on existing homes. Involve other City staff with the climate planning process through training because they are necessary to make sure these measures are being enforced.

San Diego Bike Coalition

Monday, May 13th, 2024, 3pm

Microsoft Teams Meeting

Attendees

Ryan Lamkin, City of Encinitas

Chloe L., San Diego Bike Collation

Questions:

1. What does climate action mean to you?

A whole suite of policy and behavioral changes across many sectors, that together combine to us reaching out emissions goals which can be very large. It takes a lot of effort and courage to meet all of our goals and grassroots efforts are key part of this change.

2. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Likelihood of Flooding, Extreme Heat Events especially because they go hand in hand with mode share shift and so many issues can be solved with one solution. The impacts on vulnerable people are often something that is left out of the conversation when they need to be front and center.

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

As long as they're in line with state goals, it's a good idea and they're ambitious.

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

More focus should be put onto public transit rather than 'flexible fleet' as they don't serve those who need transit the most. Adding a baseline for mode share. Identify a mode share baseline as it helps advocates hold cities accountable. Tree planting is a good idea, especially for improving safety for bicyclists and pedestrians. Implementing a complete streets program with road diets, beautiful environments with trees. Consider a de-paving initiative that will remove pavement that will allow for stormwater runoff, beatify streets, and reduce costs. Implement more class 4 bike lanes.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

Flexible fleet programs often do not serve underserved populations. If considering future bikeshare programs, consider working with other cities across region, as those who use may not live in Encinitas. Ensure that bike lane connections are occurring between communities, throughout the city.

6. Any other questions or comments?

A good policy question is to research if micromobility sharing can exist on its own without government funding. A paper to consider for the CAP is a BCC article on de-paving.

Encinitas Bike Walk

Friday, May 30th, 2024, 2pm

Encinitas City Hall

Attendees

Ryan Lamkin, City of Encinitas
Nicholas Buck, City of Encinitas
Tom B., Encinitas Bike Walk
Aaron H., Encinitas Bike Walk
Judy B., Encinitas Bike Walk
Kristine S., Encinitas Bike Walk
Travis, Encinitas Bike Walk
Trey H., Encinitas Bike Walk

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Pass

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

Is it realistic? What is the lifestyle look like per capita? Consider what the average person's emissions will look like and present that at the next workshop. Look into the implementation of the other cities CAP's. Give the community frames of reference (i.e. amount of miles of driven)

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

Don't know if it has teeth. How can we talk to other City departments and how can citizens see how departments interact to better advocate? The current City's ATP lacks diverters. Diverters make driving take more time which would encourage more biking. The rebound effect is something that has been studied and will lead to more biking. In 2045, the vision is to encourage biking and walking for short trips. Pedestrian and bicycle access corridors are a large gap in the City's ATP. A big picture vision is how land is used in Encinitas for more walkable, bikeable homes. The City should look at the zoning codes to ensure that it facilitates mixed used zoning instead of restricting. Parking requirements should be eliminated from areas that we wanted to keep walkable and bikeable while maximums should be set. Density, proximity, and mixed used are three key elements to build housing. AS the City continues to build housing and select housing element sites, they should be placed in areas that can support walkability rather

than driving such as Quail Gardens. Encinitas is more spread out than some of the communities that already have flexible fleets. Cost is a very important consideration for the flexible fleet. For TDM programs ensure that for small businesses they are not too costly making sure they're not all or nothing. Can City employees be incentivized to bike or walk to work. Making commuting alternatively fun makes more people want to do it, for example using prizes. Let's look at our largest employers in employers in Encinitas to see if we can get them to implement TDM programs. For the City's parking study making a map of areas where parking lots are underutilized to inform the micro transit study. The largest challenge is changing behaviors. Improvements to bike and ped infrastructure are perceived negatively by drivers. What could have been done differently for BCycle to succeed? What impact does land use have on the success of a bike share program? Hold more events for bike riding that get people interested in bike riding. We really want to encourage mode shift for the CAP and consider bike riding as transportation. 'Safe routes' is something missing from the CAP. 'Slow streets' and 'bike boulevard' are something missing from the CAP. Both of these would move people toward biking because they feel safe. Biking, walking, and transit has be made easier and driving has to be made more difficult. To meet 2045 goal we have to make tough choices. Many of the bike and walk goals have co-benefits such as more beautiful neighborhoods. Implement a parking benefits district where there is highly impacted parking. Parking meters can be installed, which can use revenue to fund transportation while decreasing idling emissions.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

Land use and the cost of housing are the largest concerns that directly lead to increase GHG emissions. Transportation safety is not equitable throughout the City and for those who bike/walk. The current transit system is really poor. Setting up a car share program in the city would help with low-income residents going further distances throughout the city and these programs should not be at the 'whim of the market' with a private program. A truck share program would be good too. 30% of the population in the U.S. cannot drive and many of those have the least political power. A lot of people drive but we have to represent everyone such as those who bike, walk and take transit. Charging for parking is a better equity concern because they won't end up being fined for parking illegally. Dynamic pricing is another consideration. Allowing for more mixed-use development and better land use. Apply and follow state law for affordable housing.

6. Any other questions or comments?

Can we get the GHG amounts? Encinitas Bike Walk would like to have input on the flexible fleet feasibility study. Hold meetings with the Environmental and Mobility/Traffic Commission. A lot of people just don't want to see change.

Community Resource Center

Thursday, June 20th, 2024, 11am

Virtual Teams Meeting

Attendees

Ryan Lamkin, City of Encinitas	Rebecca N., Community Resource Center

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Community Resource Center is most concerned about extreme heat events and wildfire risk. For the unhoused populations they serve, these heat events pose a major health risk to them. Wildfires also pose a health risk to unhoused populations.

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

Does this seem like its feasible? If so it seems great. Can we even go farther.

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

The landscaping equipment is a great ordinance. All electric buildings are a great idea. The city doing what they can to be more sustainable is a great idea.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

How can we make some of these transitions accessible for those modest needs. Many of them are renters and are housing burdened. We need to make living a more sustainable life more economically available to them. Low-income individuals are the most at risk in terms of climate equity. Seniors are one of the largest communities of concern that are present in Encinitas. Economically vulnerable seniors are one of the fastest growing groups throughout the state.

6. Any other questions or comments?

Reach out to Nature Collective.

Cottonwood Creek Conservancy

Thursday, May 16th, 2024, 1pm

Encinitas City Hall

Attendees

Ryan Lamkin, City of Encinitas
Crystal Najera, City of Encinitas
Mark W., Cottonwood Creek Conservancy
Brad R., Cottonwood Creek Conservancy
Jesse G., Cottonwood Creek Conservancy

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Drought events have a significant impact on habitat and loss of Biodiversity. Sea level rise is concerning for the City's beach assets.

3. What about the adopted Climate Action Plan would you like to see changed in the Climate Action Plan update?

Not the targets but the impact trees can have on them.

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

Cattails are great carbon sequesters and have number of other environmental benefits. Follow the City's own directive as to why a tree should be pruned. The right location and species matters for the City because it relates to the canopy are details that need to be focused upon. Many of the time individuals don't sort waste correctly because its not clear as to where their waste should go. How can more education be done to reduce waste production. Have more education and outreach by partnering with EDCO to help the community understand what is and is not recyclable. Compostable tree materials and waste should be recycled into mulch, and compost rather than purchasing such products. Urban wood and recycled wood should be used for creating benches or other City assets. Preserving open space should be a priority or measure that's proposed as a Carbon Sequestration measure. The City seems to lack a comprehensive rule for landscaping.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

Are there going to be incentives for individuals to switch over their landscape equipment to electric? Are the group of individuals who opted out of SDCP opting out due to a lack of income? Low-income individuals are not able to afford or install

6. Any other questions or comments?

Parking lot tree requirements are not sufficient to promote sustainable growth. There are also no requirements that trees grow, are replaced if they die, are maintained, and that they are trees that create a canopy. The city should act as a role model by planting canopy trees, and bioswales in its parking lots. Take a look at the East side of El Camino Real where several trees have died, and this is not uncommon throughout the city. By not properly maintaining trees, they lead to more emissions from the equipment needed to remove them. Following ‘Streetscape’ many of the trees that were planted years ago are being removed. The City is paying to reduce Carbon Sequestering assets. By switching to natural gas, we need to ensure that electricity is produced by renewable energy to truly reduce emissions. Carpooling should be an option for the TDM program.

San Luis Rey Band of Mission Indians

Monday, June 24, 2024

Virtual Teams Meeting

Attendees

Ryan Lamkin, City of Encinitas PJ Stoneburner

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Plants could be affected by too many carbon emissions.

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

The goal is an ambitious goal and impressive

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

Trees and other planting should be native species and drought tolerant where applicable. Creek areas and wetlands.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

Native practitioners are such a small minority that they are often not considered.

6. Any other questions or comments?

The CAP has a co-benefit of making healthier plants.

Building Industry Association (BIA)

Wednesday, May 15th, 2024, 12pm

Virtual Zoom Meeting

Attendees

Ryan Lamkin, City of Encinitas
Crystal Najera, City of Encinitas
Madelyn Wampler, City of Encinitas
Lori P., BIA
Scott H., BIA
Patrick Z., BIA
Adrian L., BIA
Arlene T., BIA
John P., BIA
Paul D., BIA
William M., BIA

Questions:

1. Which of the following climate change impacts are you most concerned about? (Extreme Heat Events, Drought Events, Increased Wildfire Risk, Increase Likelihood of Flooding, Sea level rise, Loss of Biodiversity)

Increased drought, increased wildfire risk.

3. What feedback do you have on the GHG reduction targets being considered for the CAP update?

If we're already reaching our target, then it would not be best to continue to include requirements that put burden on developers. New reductions for new targets taken on by the City rather than developers would be ideal because developers have already done so much. Putting more constraints on private development should be one of the last things we consider.

4. What are the key areas in which you think the City should focus to reduce greenhouse gas emissions? Are there specific measures you think the City should implement?

Not sure that we can comment on measures if there aren't GHG emissions reduction associated with each. City should be focusing more on existing buildings rather than new buildings because of how tight the state requirements already are. By making more requirements for homes, they become more expensive, leading to more sprawl and increased VMT. Continuing to update signals is something the City should continue to do.

5. Are there any equity issues you think the City should be aware of when updating the CAP?

Equity is about the ability to a get house or apartment that you can afford. By continuing to make more requirements for buildings, homes get more expensive to build and are passed onto the homebuyer. Considering the burden that the development industry bears.

6. Any other questions or comments?

Consider how all of the efforts from housing to VMT mitigation intertwine and interact with each other.

Public Workshop 1

Attendees Last name	First name	Organization
Giessow	Jesse	Resident
Parker	Carol	Resident
Cramer	Katie	Encinitas Environmental Commission
Hebshi	Aaron	Resident
Wisniewski	Mark	Resident
Mariko Dressel	Ali	Climate Action Campaign
Minster	Jean-Bernard	Resident
Forsythe	Lori	Resident
Archambault	Worth	Resident
O'Connor	Mark	Resident
Ana	Jeny	MASHE
Minster	C.J.	MASHE
Wang	Jim	Resident
Bruner	J.P.	Surfrider
Davis	Peter	Resident
Schneider	Linda	Resident
Tucker	Wehtaknah	Resident
Standerfer	Harold	Sierra Club
Crespo	Xiomalys	San Diego Community Power
Prendergast	Sally	Sierra Club
Schindler	Kristine	Resident
Rodriguez	Ashley	San Diego Community Power
Lyndes	Joy	Resident
Dang	Anthony	Climate Action Campaign

Total attendance	24

Comment Cards Received

There should be more carbn sequestration goals- what about preservation of natural habitat/open space? And new technologies? Urban tree cover goals should be increased and the city needs to invest in proper tree planting care because I see a lot of city planted trees that die or are stunted (in growth.) I believe we should have a qualified natural resource manager who is also an urban forester. This is such an important element that I think it needs a full-time dedicated person. Given taht most of the city is privately owned and that most development is already in existence, we need to get residents to make positive change in all areas- so incentives and education- we need to do so much more in this area. It's great to target new developments and re-models, but the majority of homes already exist. Where the city has met goals ahead of schedule- it seems like then the goal was too easy! There should be requirements to continue working on goals after they are met. Since on road transportation is 58% of our emissions, the city really needs to figure out some sort of city shuttle service. I know it's expensive but it's so important. We need to do this! I would pay an annual fee for this and I bet many citizens would too. Also the micro-transit solution is interesting. Let's do a pilot project.

Require homes sold to have energy scores with goal of having all (existing) homes to have energy score. Focus on education and outreach to ensure greater confidence of goals. Concentrate on SDCP 100% renewable power.

One other strategy that is missing (is the) implement(ation of) ordiances to reduce single use plastics, and consider the amount of GHG emissions avoided in the production of these materials- include in reduction targets. Can development code be amended to require that native vegatation and large trees be maintained on newly developed property? To present complete razing of land which release GHGs to atmosphere.

Crusing for parking can significantly add to VMT in parking-impacted areas such as downtown Encinitas. Establishing a parking benefits district (PBD) using metering to manage curb occupancy can reduce crusing and idling for parking. The excess cruising and idling detracts from the walkability of an area, and further increases VMT and GHG (emissions.) A PBD can generate revenue to fund benefits such as the proposed shuttle circulator and transit passes for employees. Infill housing and services, particularly on parking lots, reduces sprawl and the need to drive everywhere. Eliminating parking minimums for developments promising to build affordable housing can be a win-win for walkability, providing homes for those who wokr here, and can also reduce VMT by reducing the distance that people working here have to drive. Providing incentives for e-bikes can reduce VMT. Providing a means for car-sharing via a city-backed insurance system to overcome the lack of insurance available on the private market for those who want to share a car but live in seperate households. Yes! implement the active transportation plan!

On the state of the City annual report show the following so that progress can be accurately tracked year by year; number of (publically maintained) trees, number of vacant sites, number of trees planted, and number of trees removed from parks and right-of-way. Show changes from previous year. Show progress or loss of targets. Cubic yards of wood chip mulches utilized in parks and right-of-way. Cubic yards taken out of Encinitas to landfills. Increase use of urban wood from city tree removals. Use native trees in appropriate locations use best data/research when calculating GHG reduction potential.

When considering the #1 source of emissions is on-road transportation it is only logical to focus the efforts on reduction of on-road transportation. In short, reduced quantity of vehicles that generate emissions but development mandated by the State of California increases quantity of emissions as every new development increases the quantity of vehicles, adding residents also increases the use of water, energy, construction related emissions including disturbance of ground, removal of mature trees, and the additional waste streams generated by all added residents, therefore, measures to reduce emissions is "uphill," yes, the proposed measures are helpful, however the gaps betweeen target goals to outcomes will still widen as population increases. Good luck. You need it. Because unless the State mandates include mandate(d) public transit or travel via bikes and on foot, gaps widen.

It's great to have an ordinance requiring electric leaf blowers, but there are some equity considerations. Are the independent contractors or property owners responsible? Not all indepdent contractors can afford or have access to all electric equipment (especially if they are low income coming from communities outside of Encinitas.) How can we ensure that the financial burden does not fall on the workers who cannot afford it? There are many workers who commute to Encinitas but cannot afford to live there. How are you collaborating with other cities and agencies to ensure that those workers (whoa re often low-income and people of color) have adequate access to afforable and efficient transportation every step of the way. In other words, how are you collaborating with other agencies/cities on a regional scale to ensure equity for those who are still part of the community even if they cannot afford to live there? Transportation needs to be affordable and accessible across the region in order to ensure that workers can reduce their vehicle miles traveled within Encinitas. How are you ensuring low-income engagement with communities of color who work in Encinitas even if they don't live there?

Good presentation but MTCO2e is megaton of CO2 to any scientist this is a factor of 10^6 off! Use T for tons, MT is not a unit meaning "metric ton."

Incentivise: New homes water capture. WE-1; waterwise does not work with our zip. No incentive to remove grass and plant natives. Less H2O. RE-2; Our city zip code does not work with solar panel incentives. OR-1; no incentive to get rid of blowers. No enforcement. ZW-1; I didn't want a green waste or kitchen caddie- I compost everything. I still have to pay. Mature trees need a replacement valve for all development-pay for removal or incentivise to keep them. More open space to plant urban forest for more carbon sequestration.

I would like to see every home in Encinitas to be required to have a Department of Energy Home Energy Score. This is widely practiced in parts of Europe for every home sold. A home energy score provides a baseline for home buyers and owners to evaluate carbon footprint and implement energy efficiency measures. Getting a home energy score is a small cost with valuable benefits. What can be measured can be managed.

In the inventory, recommended actions are made to improve the health and structure of worthy trees, especially land-mark and other prominent trees. These maintenance recommendations include needed irrigation, fertilizing, pest and disease management, cabling or bracing, and especially pruning. The information gathered in a tree inventory is summarized in a tree report, and tree canopy dimensions and trunk locations are placed on site or grading plans to develop a tree preservation plan. The tree report and tree preservation plan allow information on tree health and structure, as well as on tree size and location, to be considered when designing a development. pg 13 One long-term goal of the City of Encinitas is a sustainably managed urban forest. The maintenance of the social, recreational, ecological, economic, and green infrastructure functions of trees and their benefits over time contribute to this goal. Stewardship of naturally occurring and planted trees is a central element in urban forest sustainability. Tree health, safety, and preservation during development and other construction activities; species and site selection; quality of planting stock; standards of performance; and best management practices are integral to a sustainable urban forest. Tree protection should begin before construction starts. If preservation measures are delayed or ignored until construction begins, the trees may be adversely affected. In many cases, construction impacts to trees cannot be eliminated. Therefore, the City's goal is to allow construction projects to proceed while minimizing injury to trees. Successful tree preservation occurs when City staff, designers, construction personnel, and project managers are committed to tree preservation (see Figure 2.1). All members of the project team must be familiar with the rudimentary aspects of tree growth and development in order to understand the relationship between tree survival and construction practices. Coordination with a certif2.20.7 Tree Pruning and Removal Prior to construction, various trees may require pruning to avoid structures or proposed construction activity. Construction or contractor personnel shall not attempt pruning. Only personnel approved by the City arborist can perform pruning operations. All pruning, branch tieback, tree removal, root pruning, fertilizing, and irrigating shall be performed by or under the direct supervision of an ISA- certified arborist approved by the City arborist. The qualifications of the ISA-certified arborist shall be submitted prior to project initiation and shall be approved by the City arborist and/or Department Directors. Removal of trees adjacent to trees that are to remain requires a great deal of care. Only personnel approved by the City arborist shall engage in tree removal. Removal of trees that extend into branches or roots of protected trees shall not be attempted by the demolition or construction crew, or by grading or other heavy equipment. Before removing tree stumps, the City arborist shall determine if roots are entangled with trees that are to remain. If so, these stumps shall have their roots severed before extracting them. 2 p9 14 1. Tree preservation is the responsibility of City staff and developers to ensure compliance with the requirements of this Manual. Each development participant must understand that their activities and decisions influence the success of tree preservation pg 16 Plan with a Vision Disruption of any tree by construction activities may negatively affect its physiological processes and cause depletion of energy reserves and decline in vigor, often resulting in tree death. Typically, this does not manifest until many years after the tree is disrupted. Preservation of mature trees during construction has significant benefits to the success of a projectpg 21 2.20.5 Tree Protection Zone During the design phase of the project, the project arborist, project manager, and City arborist shall work together on developing the TPZ for each tree impacted by the project. During the design and grading review phase, all tree-work-related applications and documentation shall be completed as part of the approval process. If an unresolved disagreement arises between the project arborist and the project manager on the size of a TPZ for a particular tree, the dispute shall be brought to the City arborist or Department Directors, who shall render a final decision on the size of the TPZ. Each tree to be retained shall have a designated TZ identifying the area sufficiently large enough to protect it and its roots. The TPZ shall be shown on all site plans, including demolition, grading, irrigation, electrical, and landscaping. Improvements or activities such as paving, utilities, and irrigation trenching, including other ancillary activities, shall occur outside the TPZ, unless otherwise specified. The protection fence shall serve as the TPZ. The City arborist shall approve the final TPZ. T 2.20.3 Site Plan Review Process Prior to project approval and the issuance of associated permits, site plans shall be reviewed and approved by the City arborist, project manager, and appropriate City staff. The project manager and/or department manager shall work with the appropriate department (i.e., Department of Development Services; Parks, Recreation, and Cultural Arts; and/or Public Works) to ensure project requirements are met. All documents shall be circulated to appropriate City of Encinitas staff and provided to the City arborist.
pg 50 B. Mature Trees. Mature and established trees do not need frequent supplemental irrigation unless there is evidence that the tree is declining in health and vigor. If so, it should be further determined by a qualified arborist that the tree will benefit from supplemental irrigation. It is also appropriate to water trees prior to and during extreme heat events and prolonged heat waves to maintain health. When watering mature trees, saturate the entire area of soil underneath the tree canopy, but do not directly apply water to the trunk or visible supporting roots. p9 57 8.60.1 Disclosure of All Trees On and Near the Site The property owner or designee shall provide accurate information to the project arborist to develop the tree protection measures and to enable accurate recommendations to ensure their survival. This site plan shall accurately indicate the surveyed location, species, and size of trunk and leaf canopy; show the dripline of any neighboring trees that may be impacted by the project; and depict publicly owned trees that are within 30 feet on each side of the project. Failure to show a tree on the plans later determined to be affected by construction may require the work to stop until mitigation can be agreed upon by the property owner and the City.

1. **Carbon sequestration and Habitat preservation**; increased targets for tree planting, open spaces, utilization of new technologies.
2. **Engagement and Education**; City should expand outreach to underserved communities.
3. **Incentives**; City should fund incentives for sustainable practices.
4. **Housing**; utilize urban planning practices that inherintly reduce VMT. Expand access to housing.
5. **Reduce VMT**; use of active transportation plan, fund city 'shuttle,' meter parking.
6. **Population growth**; allow for population growth in a sustainable way.

Group Discussion Notes Facilitator Group	Reduction Target Feedback	Existing Measures	Missing Measures	Geographic Equity	Climate Vulnerabilities
Crystal	None	Expansion of carbon sequestration through increased municipal tree planting targets. Expand carbon sequestration beyond trees by use of open space or new technologies. Create incentives for private tree planting. Expand the target number of roundabouts.	Integration of municipal sustainability (i.e. employee green guide) into CAP. Reduction of turf at municipal sites. Reduce VMT and vehicle GHG by passing a no idling ordinance, creating a parking benefits district, charging for curb parking, and integrating housing development into CAP.		
Madelyn	None	Continue to increase customer participation in Power100. Increase the municipal tree planting targets. Explore carbon sequestration with new technologies such as 'blue carbon.'	Require homes sold to have a 'Home Energy Score.' Integrating compliance and enforacement as a measure into CAP.		
Andrew		Implementing measures through HOA's (i.e. leafblower enforcement.) Expand carbon sequestration with blue carbon. Improve mobility acorss I-5 and railroad tracks. Further explore equity framework.	Integrate the use of infill housing development and mixed-use buildings to reduce VMT. Expansion of public transportation options. SDCP discounts for low-income residents.	Increased pedestrian and bike crossings at rail and I-5.	
Brett	None	Create incentives for existing measures to further their adoption throughout the City. Expansion of tree canopy. Continue outreach and education, especially to younger demographics and people of color.	Rainfall capture as a CAP measure. Implement a recycling program for the lifecycle of solar panels.	Senior equity concern at senior housing development near El Camino Real	Increased tree canopy cover in commercial centers along El Camino Real.
Ryan	Clarify how much of the emissions reductions that been done are done by the city vs. state/federal reductions	Improve the enforcement for existing CAP measures (i.e. leafblowers.) Reallign our evaluation of completeness for the measures (i.e. city says complete when there's ongoing need to transition and enforce.)	Integrating enforcement as a CAP measure. Require bike parking at new developemnts. Fund an electric school bus and school bus program.	Quail Gardens Dr, Leucadia, and Olivenhain housing projects have a lack of surrounding transportation options.	Coastal erosion and sea level rise along the coast. Wildfires, especially in Olivenhain, and a lack of equipment.
Synthesis	**1. Carbon Sequestration**; expandsion of carbon sequestration measure. **2. Enforcement**; include enforcement of CAP measures as a future measure. **3. Transportation**; improve existing and consider new measures. **4. Equity**; tie sustainable development into new housing.				

Public Workshop 2

Attendees Last name	First name	Organization
Wang	Jim	
Feeny	Ann	San Diego 350/San Diego Building Electrification Coalition
Lyndes	Joy	City of Encinitas City Council
Bruner	JP	City of Encinitas Environmental Commission
Parker	Carol	City of Encinitas Environmental Commission
Schumann	Mary Jo	Climate Action Circle
Goldsmith	Katrina	Climate Action Circle
Sherop	Susan	City of Encinitas Planning Commission
Tucker	Wehtahnah	
Parker	Vaun	

Total attendance	10

Comment Cards Received

I'm super impressed by the CAP and Encinitas' commitment to decarbonization!!! Thank you!! However! I strongly encourage the city to include climate resilience factors in the CAP rather than the sole focus on decarbonization/sequestration.
For example, tree canopy looks like a lackluster solution in the CAP, but what if there was an additional column for climate resilience factors? Increasing the tree canopy is apparently the only thing the CAP that will mitigate against the effects of extreme heat, flood, drought, erosion, biodiversity loss, etc.
Climate resilient cityscape is needed as extreme heat is already here.
Checkout waterra.com for resources/research/case studies. Climate resilient cityscape also sequester carbon but does so much more.
Rain and stormwater harvesting and diversion into urban landscapes is a powerful climate solution!

Transportation: Many more bike racks are needed at busy areas if we want to encourage bikes. Required affordable housing mandates allow fewer parking spaces. However, developers always give more parking than is required, which simply adds to more VMT, more daily trips, more GHG. Hold them to the minimum. Coastal zone property is inherently not suited to affordable housing development as the ocean pulls away (subsidence) and tide runs in and out every day eroding the shoreline and "working" at foundations. It is more expensive to build near the coast, so limit it to areas further inland. Work with school districts, boys and girls clubs, NCTD, etc. to create school pick up and drop off using pedicabs (w/ electric assist.) Reduce GHG. Protect all trees, not just street trees. Especially native trees such as oaks and pines (Coast live oaks, Torrey pines and more)

How can we get more residents and business owners to participate in updates, surveys, etc.? A challenging problem but one that needs attention because if you don't have a representative and generalizable study, then results and subsequent planning are very suspent and precarious. I question the validity and reliability of a survey that is based on a very small sample. Need to communicate in advance to increase participation.
I'm also a big proponent of citizen education and communication of all these issues and measures such as recycling, water use, etc. How can people do the right thing if they don't know what the right is or what the options even are?
Keep up the good work to decarbonize Encinitas, etc. and help save our Mother Earth.

Zero waste: The City can and I believe should be a leader in proper waste handling. Having organic waste collection at City events and beaches and farmers markets can be a huge opportunity for education. Start fining people/businesses that do not handle organic waste properly.

Involve school age residents in contributing to CAP draft process (partner with district to go into schools – meet them where they're at.)
Involve existing HOA's in CAP draft (attend their monthly meetings)
Partner with nearby jurisdictions to adopt similar measures.
Barriers: Rethink the CAP as just decarbonization plan and look at it through a resiliency lens – i.e. tree canopy becomes high instead of low.
Leverage relationship with state, county organizations to create a protected rebate fund – especially for measures that need to be 'cost effective' or 'cost neutral.'

Incorporate Climate Resilience
Transportation Initiatives
Community Engagement
Zero Waste Initiatives
Collaboration

Strategy	Measure	Dots (support)
Clean & Efficient Transportation	CET-2: Implement a Flexible Fleet Program	8
Building Decarbonization	BD-5: Decarbonize Existing Buildings	7
Zero Waste	ZW-1: Implement a Zero Waste Program	7
Off-Road Transportation	OR-1: Limit Use of Gas-Powered Leaf Blowers	5
Carbon Sequestration	CS-1: Establish a Tree Canopy Goal for the City	5
Renewable Energy	RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems	4
Renewable Energy	MRE-1: Install Microgrids with On-Site Renewable Energy and Storage at Municipal Facilities	4
Clean & Efficient Transportation	CET-7: Require Transportation Demand Management Programs for New Nonresidential and Major Redevelopment Projects	4
Clean & Efficient Transportation	MCET-1: Transition to Zero Emission Vehicle Municipal Fleet	4
Off-Road Transportation	OR-2: Limit Use of Gas-Powered Landscape Equipment	4
Carbon Sequestration	CS-2: Enforce Landscape Tree Requirements at New Developments	4
Carbon Sequestration	MCS-1: Plant and Maintain City Trees	4
Building Decarbonization	BD-2: Require New Residential Development Decarbonization	3
Building Decarbonization	BD-3: Require Existing Nonresidential Development Energy Efficiency	3
Building Decarbonization	BD-4: Require New Nonresidential Development Decarbonization	3
Building Decarbonization	MBD-1: Implement Energy Efficiency and Decarbonization Projects at Municipal Facilities	3
Building Decarbonization	BD-1: Require Existing Residential Development Energy Efficiency	2
Renewable Energy	RE-1: Maintain Membership in San Diego Community Power	2
Water Efficiency	WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems	2
Clean & Efficient Transportation	CET-3: Improve Traffic Flow	2
Clean & Efficient Transportation	CET-4: Require Existing Residential Buildings to be Electric Vehicle Ready	2
Clean & Efficient Transportation	CET-6: Install Public Electric Vehicle Charging Stations	2
Carbon Sequestration	CS-3: Incentivize Tree Planting on Private Property	2
Building Decarbonization	MBD-2: Convert all City-Owned Lighting to LED	1
Water Efficiency	WE-1: Support Local Water Districts' Water Conservation Efforts	1
Clean & Efficient Transportation	CET-5: Require Nonresidential Electric Vehicle Charging Stations	1
Clean & Efficient Transportation	MCET-2: Implement a Municipal Employee Transportation Demand Management Program	1
Clean & Efficient Transportation	CET-1: Implement the Active Transportation Plan	0

Posterboard Commnets on Proposed Measures Building Decarbonization	Renewable Energy	Water Efficiency	Clean & Efficient Transportation	Off-Road Equipment	Zero Waste	Carbon Sequestration
Create opportunities to partner w/ state organizations to build up protected 'rebate fund (for reduction measures that need to be cost effective.)	RE-2: Storage should be included here too. Plenty of solar on the grid mid-day that could be captured.	Rain and stormwater: Slow it, spread it, sink it to provide climate cooling flood mitigation support native plants clean the air sequester carbon.	We have a lot of seniors who won't ride bikes or walk. Sad truth.	Educate and communicate what citizens should do if they see violations.	Mandatory residential and nonresidential organic waste diversion.	Suggest adding a column for climate resilience factor: will a measure help the city mitigate extreme weather? Heat, flood, etc. Example: Medellin City cooled itself by 2 degree Celsius in 3 years with green corridors and green infrastructure (nature-based) mitigate heat, flood, air pollution, drought.
Have cheaper and faster permitting process for energy efficiency and green building plans. MBD-1: Is it City policy that when an appliance needs replacement that it is converted to electric?	Identify grants- make info available to residents. RE-2: Important. MRE-1: Important.	Water- could the native plant ordinance be used as lever here?	CET-6: Need to be strategic about where level 2 and level 3 chargers are installed. Level 2 must be somewhere people spend a lot if time (home, work, downtown, etc.) CET-6: Do not neglect Level 1 (slow) charging. This is effective for at home but not everyone can charge at homes (apartments.) How do we help renters charge at home?	OR 1- Target HOAs give BIG fines. Use fines to enforce gas-powered landscape equipment.	Provide food waste collection at city events and beaches (weekends) with explanatory signage. Food recovery program!!	Stormwater/rainwater capture-swales curb cuts, etc. to direct runoff to parkways, trees, etc. Increases climate resilience and cooling and tree cover while mitigating storm damage, erosion, and runoff. Incentives/educate private and commercial properties on stormwater capture, resilient landscapes for flood, heat, drought mitigation.
Decarb nonresidential- Promote restaurants/businesses that go all electric as proof of concept. Partner w/ local chef or restaurant maybe? There is low hanging fruit that is easier to implement and see. Converting to LED lighting should be "of course"	Will SDCP incentivize solar PV on nonresidential? REC's can be very problematic- some not very effective.		Many more bike racks are needed on busy streets with shops. Also at transit areas. CET-2: Microtransit very important. Make it affordable (heavily subsidized) Transportation is #1 source of GHG so why not more emphasis of mode-shift away from cars? ATP may help but there should be more effort to encourage much more biking and walking. E.g. e-bikes help with hills but many people still do not feel safe with only a six-inch white line "protecting" them from 50mph cars. Safety for bikes.		Prioritize high and medium GHG reduction strategies. Tell people how much GHG they can reduce by putting scraps in green bin.	Think beyond solitary trees to native plant communities that are far more resilient, drought tolerant and carbon sinking when they are grouped. E.g. Miyawaki forests. Incentivize tree and native planting on private property. Resources, example plant communities, mulch.
Provide where to find counsel for property owners on navigating/aggregating IRA and local incentives for energy efficiency, heat pumps, etc. Require replacement appliances to be energy efficient. Residential and non residential. Solar on municipal buildings (with battery storage also.) Can do with PPA if not money readily available. Building performance standards for existing. MB-1: Replace all gas appliances at burnout (or before) BD-5: How do we promote all electric at point of sale for appliances (like Home Depot.) Perhaps signage that highlights green building incentive program rebates?			MCET-2: Could employees gain access to City hall chargers. Support perspective of apartment dwellers with electric cars. At least one level 3 charging station in the City limits! CET-2: Flexible fleet that meets needs of residents and visitors. CET-3: Improving traffic flow sounds good but it may actually increase driving you make it easier to drive- it's simple supply and demand- if you make it easier, you increase demand. Mode shift won't happen overnight but it has highest potential for measurable GHG reduction. Mandates housing from HCD requires less cars- but developers give more than required so more cars=greater GHG. Hold down cars.		Education and communication to residents and businesses is key for water zero waste, everything! Provide free audit to everyone to reduce waste generation. Need to educate and communicate how to recycle, what where, etc. Citizens don't know and every waste company does it differently. Highlight restaurants and commercial businesses that comply with SB 1383. Partner with Solana Center for Environmental Innovation as I think you already are.	CS-2: Construction project resolution to maintain 75% existing of mature trees. Require more trees where mature trees are lost- not simple 1:1 higher number to replace. Protect all mature oaks and native trees- even at private property. Definitely plant trees but not ones that make a big mess! (like on 2nd St.) What about community gardens for carbon sequestration and sustainable farming/food growing? Blue carbon- partner with Wildcoast/Scripps on carbon sequestration potential. Partner with neighboring jurisdictions to implement similar CAP elements.

Common themes:

Energy Efficiency and Electrification:

Create a protected rebate fund in partnership with state organizations to support cost-effective measures for reducing greenhouse gas emissions.
Establish a faster and more affordable permitting process for energy efficiency upgrades and green building plans.
Encourage the conversion of appliances to electric when replacements are needed, potentially making it city policy.
Promote businesses, especially restaurants, that transition to all-electric operations as a proof of concept.

Renewable Energy and Solar Initiatives:

Install solar panels on municipal buildings, potentially with battery storage, using Power Purchase Agreements (PPAs) if direct funding is not available.
Explore grants and incentives for residents and businesses interested in solar PV and renewable energy installations.

Transportation and Mobility:

Increase the availability of bike racks on busy streets and at transit hubs to encourage cycling.
Implement microtransit options that are heavily subsidized to make them affordable alternatives.
Expand electric vehicle (EV) charging infrastructure, including Level 1 (slow) chargers for residents who cannot charge at home due to living in apartments.

Water Management and Sustainability:

Promote rain and stormwater capture techniques such as swales and curb cuts to enhance climate resilience, mitigate flooding, and support native plant communities.
Incentivize stormwater capture and resilient landscape practices for private and commercial properties.

Additional Public Comments

From: Chase Beach
To: Climate Action
Subject: Encinitas Climate Action Plan
Date: Wednesday, July 10, 2024 8:46:18 AM

CAUTION: External Email. Do not click any links or open attachments unless you recognize the sender, verified their email address, and know the content is safe.

Hello,

My name is Chase Beach and I'm a resident of Encinitas and board member of the Leucadia 101 Mainstreet Association. My business, Anadro, is a new independent power provider that installs over-sized residential rooftop solar systems at $0 installation cost to the homeowner. We sell renewable energy to the homeowner at a rate that is discounted 25% from the lowest SDG&E schedule DR rate.

We have three installations in Rancho Bernardo and Poway and I would love to work with the city of Encinitas to introduce this to our community. I saw the email about the CAP Update workshop and wanted to see if it's too late to get involved. Our customers are saving hundreds on their electricity bills and are reducing their carbon footprints.

With the introduction of NEM 3.0 April 2023 the rooftop solar market has plunged by over 80%. Our company has found an innovative way to bring back solar in California and we would love to work with the city.

If this is something of interest to the CAP I would love to find a time to meet.

Thanks!
Chase

From: Crystal Najera on behalf of Climate Action
To: Chase Beach; Climate Action
Subject: RE: Encinitas Climate Action Plan
Date: Friday, July 12, 2024 4:47:50 PM
Attachments: image001.png

Hi Chase,

Thank you for your input regarding the City's Climate Action Plan. Your work is very much aligned with the City's efforts to implement our Climate Action Plan. I encourage you to attend the workshop next week and provide your input.

When it comes to working with private businesses, please know that City must follow certain municipal policies which restricts this capability. While we are not able to promote your work directly though the CAP update process, please know that it is a very valuable resource for the community.

Thank you,

CRYSTAL NAJERA
Sustainability Manager
Development Services Department
505 South Vulcan Ave, Encinitas, CA 92024
760.943.2285 | cnajera@encinitasca.gov
www.encinitasca.gov

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Conduct business with the City of Encinitas online from the convenience of your office, home, or mobile device!
Please tell us how we are doing.

From: Chase Beach <chase@anadro.com>
Sent: Wednesday, July 10, 2024 8:46 AM
To: Climate Action <climateaction@encinitasca.gov>
Subject: Encinitas Climate Action Plan

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Thanks!
Chase

From: Stacy Wolter
To: Climate Action
Subject: CAP Suggestions
Date: Thursday, July 11, 2024 8:44:49 AM

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Hello,

I appreciate the city's action to reduce its carbon footprint. I read through the CAP candidate list and I have a couple to add for consideration.

1) **Requiring Low C02 Concrete for new construction (private and public)**
I understand that cement production is the second highest generator of C02 emissions. (Source: https://www.chathamhouse.org/sites/default/files/publications/research/2018-06-13-making-concrete-change-cement-lehne-preston.pdf)
There are new and cost-effective low-carbon concrete sources. The City could mandate that any new construction whether public or private use a low-carbon concrete source.

2) **Expediting Bike Traffic Safety & Security**
I understand there is a plan to add bike lanes and sharrows to Encinitas roads, but it seems like progress is slow. Could the City assign a staff person to expedite this?
Also, there's a lack of awareness of how to safely pass a cyclist. I observe drivers crossing into on-coming traffic, around blind corners, and over double solid lines to pass cyclists. Could the city post signs about the requirement to **wait** until it's safe and legal to pass? (BTW, I appreciate the City's effort to reduce speed limits. Changing drivers' expectations about entitlement to drive as fast as possible is difficult.)
Finally, could the City mandate that commercial areas provide secure ways for cyclists to lock up their bikes in highly visible spots? Perhaps even sponsor a contest for the most functional and decorative racks?

3) **Buying from Manufacturers with a Viable Recycling Plan**
It seems to me that the onus for reducing landfill waste should be on the businesses that manufacture the goods. For example, KitchenAid should have a viable plan for how its refrigerators are recycled so that they don't end up in landfills. Could the City in its RFPs start asking its suppliers for recycling plans for the goods they will be providing? If there are manufacturers in Encinitas, could the City require them to produce a recycling plan for their goods when they apply for permits?

4) **Lobbying the State for a "Waste-to-Energy Plant"**
I wrote to Edco to ask them about implementing something like Sweden's waste to energy plant, and they replied that their hands are tied because it's against state law to burn garbage. Could the City collaborate with other like-minded cities to lobby the state to start a similar waste-to-energy plant initiative?

Thanks so much for your attention to this important matter.

Best regards,
Stacy Wolter

858-761-2803

From: Crystal Najera on behalf of Climate Action
To: Stacy Wolter; Climate Action
Subject: RE: CAP Suggestions
Date: Friday, July 12, 2024 4:38:35 PM
Attachments: image001.png

Hi Stacy,

Thank you for your input regarding the City's Climate Action Plan. Your email will be retained in the project record and considered as we work to develop a final list of measures for the CAP update.

CRYSTAL NAJERA
Sustainability Manager
Development Services Department
505 South Vulcan Ave, Encinitas, CA 92024
760.943.2285 | cnajera@encinitasca.gov
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Please tell us how we are doing.

From: Stacy Wolter <stacy.wolter@gmail.com>
Sent: Thursday, July 11, 2024 8:44 AM
To: Climate Action <climateaction@encinitasca.gov>
Subject: CAP Suggestions

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Thanks so much for your attention to this important matter.

Best regards,
Stacy Wolter
858-761-2803

From: Crystal Najera on behalf of Climate Action
To: Mark Wisniewski; Climate Action
Subject: RE: Climate Action Plan - Trees
Date: Friday, July 12, 2024 4:35:13 PM
Attachments: image001.png

Hi Mark,

Thank you for your email. Our Parks and Public Works departments track City trees using a geographic information system app. All trees that are planted and removed are tracked. If one plant dies and is removed it is subtracted from the inventory. It does not count as two trees planted. If the removed tree is replaced that would be counted as a "net zero" addition to the City tree inventory.

To date, I have not assessed our tree inventory to determine the age of the trees that have been removed, but our City tree data has a fair amount of detail, and I believe this could be done.

CRYSTAL NAJERA
Sustainability Manager
Development Services Department
505 South Vulcan Ave, Encinitas, CA 92024
760.943.2285 | cnajera@encinitasca.gov
www.encinitasca.gov

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Please tell us how we are doing.

From: Mark Wisniewski <wisniewskiandassociates@gmail.com>
Sent: Thursday, July 11, 2024 1:43 PM
To: Climate Action <climateaction@encinitasca.gov>
Subject: Climate Action Plan - Trees

CAUTION: External Email. Do not click any links or open attachments unless you recognize the sender, verified their email address, and know the content is safe.

Hi Crystal,
I would appreciate it if you could answer the following questions.

Of the trees that have been planted has there been any verification of how many are still alive?

If one of the planted trees dies, is removed and another tree planted in the same spot, does that count as two trees planted?

Has there been any consideration for the number of mature trees that have been removed during the time the Climate Action Plan has been in place?

Thank you for your time in considering my questions.

Mark Wisniewski

WISNIEWSKI & ASSOCIATES
LANDSCAPE ARCHITECT – INDEPENDENT CONSULTING ARBORIST
2036 Countrywood Way – Encinitas, CA 92024-5401
760-840-7501 cell
Licensed Landscape Architect No. 3281 - Retired
International Society of Arboriculture - Certified Arborist No. WE-0742A - Retired
International Society of Arboriculture - Tree Risk Assessment Qualified - Retired

CAP Update
Survey Responses

CAP Update Survey

Responses accepted between August 5, and November 15, 2024

1. The City of Encinitas is proposing a 40% reduction in 2016 greenhouse gas (GHG) emission levels by 2030 and an 85% reduction in 2016 GHG emission levels by 2045. Please provide any feedback on the proposed reduction targets.

Answered: 7

Skipped: 0

Left Blank: 12

I recommend Better Buses, Better Cities: How to Plan, Run, and Win the Fight for Effective Transit Book by Steven Higashide A good network of electric buses will reduce emissions and pollution
10/03/2024 10:19 AM

The City must come up with a system for valuing GHG emission solutions based not only on their GHG reductions, but also their contribution to climate resilience. For instance, improving natural carbon sinks at our parks, yard, and medians will yield resilience to heat, drought, flood, and fire, but if resilience isn't valued, such projects will only be evaluated based on GHG reduction, undervaluing it. Resilience brings immediate benefits and must be valued accordingly.
09/01/2024 6:38 PM

Why don't we work on 40% reduction in crime or city wasteful spending? This is a nice to have, meanwhile petty theft and threats from homeless people are ignored.
08/08/2024 2:19 PM

The only GHG that matters is water vapor (water vapor is > 100X more powerful GHG than CO2 and CH4, which are trace gases with little to no impact on climate). What does the CAP plan to do to reduce water vapor?
08/06/2024 11:55 AM

Waste of tax dollars
07/26/2024 5:18 AM

Depends on how they are estimated -- this is open to question.
07/25/2024 8:24 PM

My feedback is to forget this nonsense and FIX THE POTHOLES. In addition, please immediately work on a no camping city ordinance based on the recent Supreme Court decision.
07/25/2024 8:08 PM

2. BD-1: Require Existing Residential Development Energy Efficiency

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	3
Somewhat Support	0
Neither support nor oppose	0
Somewhat Oppose	3
Fully Oppose	11

ANSWER CHOICES	RESPONSES	
Fully Support	17.65%	3
Somewhat Support	0.00%	0
Neither support nor oppose	0.00%	0
Somewhat Oppose	17.65%	3
Fully Oppose	64.71%	11
TOTAL		**17**

3. BD-2: Require New Residential Development Decarbonization

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	3
Somewhat Support	1
Neither support nor oppose	2
Somewhat oppose	2
Fully oppose	9

ANSWER CHOICES	RESPONSES	
Fully Support	17.65%	3
Somewhat Support	5.88%	1
Neither support nor oppose	11.76%	2
Somewhat oppose	11.76%	2
Fully oppose	52.94%	9
TOTAL		**17**

4. BD-3: Require Existing Nonresidential Development Energy Efficiency

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	3
Somewhat Support	1
Neither support nor oppose	1
Somewhat oppose	2
Fully oppose	10

ANSWER CHOICES	RESPONSES	
Fully Support	17.65%	3
Somewhat Support	5.88%	1
Neither support nor oppose	5.88%	1
Somewhat oppose	11.76%	2
Fully oppose	58.82%	10
TOTAL		**17**

5. BD-4: Require New Nonresidential Development Decarbonization

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	4
Somewhat Support	0
Neither support nor oppose	3
Somewhat oppose	1
Fully oppose	9

ANSWER CHOICES	RESPONSES	
Fully Support	23.53%	4
Somewhat Support	0.00%	0
Neither support nor oppose	17.65%	3
Somewhat oppose	5.88%	1
Fully oppose	52.94%	9
TOTAL		**17**

6. BD-5: Decarbonize Existing Buildings

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	3
Somewhat Support	0
Neither support nor oppose	1
Somewhat oppose	2
Fully oppose	11

ANSWER CHOICES	RESPONSES	
Fully Support	17.65%	3
Somewhat Support	0.00%	0
Neither support nor oppose	5.88%	1
Somewhat oppose	11.76%	2
Fully oppose	64.71%	11
TOTAL		**17**

7. MBD-1: Implement Energy Efficiency and Decarbonization Projects at Municipal Facilities

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	5
Somewhat Support	0
Neither support nor oppose	1
Somewhat oppose	2
Fully oppose	9

ANSWER CHOICES	RESPONSES	
Fully Support	29.41%	5
Somewhat Support	0.00%	0
Neither support nor oppose	5.88%	1
Somewhat oppose	11.76%	2
Fully oppose	52.94%	9
TOTAL		**17**

8. MBD-2: Convert all City-Owned Lighting to LED

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	9
Somewhat Support	3
Neither support nor oppose	2
Somewhat oppose	2
Fully oppose	1

ANSWER CHOICES	RESPONSES	
Fully Support	52.94%	9
Somewhat Support	17.65%	3
Neither support nor oppose	11.76%	2
Somewhat oppose	11.76%	2
Fully oppose	5.88%	1
TOTAL		**17**

9. Please provide any additional comments or suggestions for Building Decarbonization measures.

Answered: 8Skipped: 0Left Blank: 11

I am not in support if these measures create extra costs for homeowners and business owners. They should be incentivised and not mandatory for hardship purposes.
11/01/2024 7:11 AM

Additional measures that should be considered include developing and adopting a Building Performance Standard to cover existing building decarbonization. In addition, a specific action to be included in BD-5 can include adopted the 2025 State Building Code voluntary measure that requires heat pumps to be installed when air-conditioning units are replaced.
10/25/2024 4:24 PM

Don’t make things a burden to lower income people. Regulations increase costs and even the city does not need the increase in costs.
08/08/2024 2:19 PM

I think these measures will worsen problem of lack of affordable housing in our community.
08/08/2024 8:55 AM

This is all focused on a trace gas in our atmosphere (CO2 that has a concentration between 0.04% and 0.045%). What a waste of time, energy and money!
08/06/2024 11:55 AM

All opinions influenced by cost.
07/26/2024 1:08 PM

Don't impose arbitrary energy efficiency standards on existing residences. The true metric is a given home's energy consumption record. Price natural gas and electricity by usage only, to incentivize conservation. Incentives are always going to be more effective than edicts.
07/25/2024 8:24 PM

FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES. FIX THE POTHOLES.
Do you catch the theme here? City government should serve it's citizens. Not some pie in the sky ridiculous notion.
07/25/2024 8:08 PM

10. RE-1: Maintain Membership in San Diego Community Power

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	3
Somewhat Support	0
Neither support nor oppose	8
Somewhat oppose	2
Fully oppose	4

ANSWER CHOICES	RESPONSES	
Fully Support	17.65%	3
Somewhat Support	0.00%	0
Neither support nor oppose	47.06%	8
Somewhat oppose	11.76%	2
Fully oppose	23.53%	4
TOTAL		**17**

11. RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	2
Somewhat Support	2
Neither support nor oppose	0
Somewhat oppose	1
Fully oppose	12

ANSWER CHOICES	RESPONSES	
Fully Support	11.76%	2
Somewhat Support	11.76%	2

Answer		Responses
Neither support nor oppose	0.00%	0
Somewhat oppose	5.88%	1
Fully oppose	70.59%	12
TOTAL		**17**

12. MRE-1: Install Microgrids with On-Site Renewable Energy and Storage at Municipal Facilities

Answered: 17

Skipped: 0

Left Blank: 2

Answer	Responses
Fully Support	5
Somewhat Support	0
Neither support nor oppose	3
Somewhat oppose	2
Fully oppose	7

ANSWER CHOICES	RESPONSES	
Fully Support	29.41%	5
Somewhat Support	0.00%	0
Neither support nor oppose	17.65%	3
Somewhat oppose	11.76%	2
Fully oppose	41.18%	7
TOTAL		**17**

13. Please indicate your support or opposition of the following Water Efficiency measures.

Answered: 3

Skipped: 0

Left Blank: 16

These are not water efficiency so not sure
08/08/2024 2:19 PM

Conserving energy is good. Fossil fuels will run out eventually and the sooner we start to develop practical alternatives, the better. Solar is fine. Wind is not. Nuclear is the real long-term solution.
08/06/2024 11:55 AM

How about this..... FIX THE POTHOLES. How about you not require anything of citizens until you do your job of FIXING THE POTHOLES!!!
07/25/2024 8:08 PM

14. WE-1: Support Local Water Districts' Water Conservation Efforts

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	4
Somewhat Support	4
Neither support nor oppose	4
Somewhat oppose	2
Fully oppose	2

ANSWER CHOICES	RESPONSES	
Fully Support	25.00%	4
Somewhat Support	25.00%	4
Neither support nor oppose	25.00%	4
Somewhat oppose	12.50%	2
Fully oppose	12.50%	2
TOTAL		**16**

15. WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	4
Somewhat Support	2
Neither support nor oppose	0
Somewhat oppose	2
Fully oppose	8

ANSWER CHOICES	RESPONSES	
Fully Support	25.00%	4
Somewhat Support	12.50%	2
Neither support nor oppose	0.00%	0
Somewhat oppose	12.50%	2
Fully oppose	50.00%	8

Answer	Responses
TOTAL	16

16. Please provide any additional comments or suggestions for Water Efficiency measures.

Answered: 7Skipped: 0Left Blank: 12

These changes should not be mandatory. They should be incentivized and voluntary.
11/01/2024 7:11 AM

Rain and stormwater management has far more potential to mitigate climate than is reflected by the above measures. All water that is captured and percolated into the landscape, rather than run off to the ocean, supports carbon sinks, biodiversity, cooling effects, flood management, drought and fire protection, etc. Curb cuts in medians could support tree cover while greatly reducing runoff and pollution. Urban runoff is a wasted opportunity for calming the climate.
09/01/2024 6:38 PM

This again creates huge costs to increase housing which helps only the rich
08/08/2024 2:19 PM

Please do not increase the cost of housing
08/08/2024 8:55 AM

Outlaw front yards- easy to enforce, will save so much water.
08/07/2024 1:58 PM

I support water conservation but not mandatory. Government is too focused on things we can't do and things we must do. GET THE HELL OUT OF OUR DAILY LIVES!!!!
08/06/2024 11:55 AM

Need I say it again..... Get out of our homes and into the streets where you belong and..... FIX THE POTHOLES!
07/25/2024 8:08 PM

17. CET-1: Implement the Active Transportation Plan

Answered: 15

Skipped: 0

Left Blank: 4

Answer	Responses
Fully Support	2
Somewhat Support	1
Neither support nor oppose	3
Somewhat oppose	3
Fully oppose	6

ANSWER CHOICES	RESPONSES	
Fully Support	13.33%	2

Answer		Responses
Somewhat Support	6.67%	1
Neither support nor oppose	20.00%	3
Somewhat oppose	20.00%	3
Fully oppose	40.00%	6
TOTAL		**15**

18. CET-2: Implement a Flexible Fleet Program

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	3
Somewhat Support	0
Neither support nor oppose	6
Somewhat oppose	2
Fully oppose	5

ANSWER CHOICES	RESPONSES	
Fully Support	18.75%	3
Somewhat Support	0.00%	0
Neither support nor oppose	37.50%	6
Somewhat oppose	12.50%	2
Fully oppose	31.25%	5
TOTAL		**16**

19. CET-3: Improve Traffic Flow

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	12
Somewhat Support	2
Neither support nor oppose	0
Somewhat oppose	2
Fully oppose	0

ANSWER CHOICES	RESPONSES

Answer		Responses
Fully Support	75.00%	12
Somewhat Support	12.50%	2
Neither support nor oppose	0.00%	0
Somewhat oppose	12.50%	2
Fully oppose	0.00%	0
TOTAL		**16**

20. CET-4: Require Existing Residential Buildings to be Electric Vehicle Ready

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	1
Somewhat Support	1
Neither support nor oppose	0
Somewhat oppose	3
Fully oppose	11

ANSWER CHOICES	RESPONSES	
Fully Support	6.25%	1
Somewhat Support	6.25%	1
Neither support nor oppose	0.00%	0
Somewhat oppose	18.75%	3
Fully oppose	68.75%	11
TOTAL		**16**

21. CET-5: Require Nonresidential Electric Vehicle Charging Stations

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	4
Somewhat Support	1
Neither support nor oppose	1
Somewhat oppose	3
Fully oppose	7

Answer	Responses	
ANSWER CHOICES	**RESPONSES**	
Fully Support	25.00%	4
Somewhat Support	6.25%	1
Neither support nor oppose	6.25%	1
Somewhat oppose	18.75%	3
Fully oppose	43.75%	7
TOTAL		**16**

22. CET-6: Install Public Electric Vehicle Charging Stations

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	6
Somewhat Support	1
Neither support nor oppose	0
Somewhat oppose	4
Fully oppose	5

ANSWER CHOICES	RESPONSES	
Fully Support	37.50%	6
Somewhat Support	6.25%	1
Neither support nor oppose	0.00%	0
Somewhat oppose	25.00%	4
Fully oppose	31.25%	5
TOTAL		**16**

23. CET-7: Require Transportation Demand Management Programs for New Nonresidential and Major Redevelopment Projects

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	3
Somewhat Support	1
Neither support nor oppose	3

Answer	Responses
Somewhat oppose	5
Fully oppose	4

ANSWER CHOICES	RESPONSES	
Fully Support	18.75%	3
Somewhat Support	6.25%	1
Neither support nor oppose	18.75%	3
Somewhat oppose	31.25%	5
Fully oppose	25.00%	4
TOTAL		**16**

24. MCET-1: Transition to Zero Emission Vehicle Municipal Fleet

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	4
Somewhat Support	1
Neither support nor oppose	4
Somewhat oppose	3
Fully oppose	4

ANSWER CHOICES	RESPONSES	
Fully Support	25.00%	4
Somewhat Support	6.25%	1
Neither support nor oppose	25.00%	4
Somewhat oppose	18.75%	3
Fully oppose	25.00%	4
TOTAL		**16**

25. MCET-2: Implement a Municipal Employee Transportation Demand Management Program

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	3

Answer	Responses
Somewhat Support	0
Neither support nor oppose	1
Somewhat oppose	2
Fully oppose	10

ANSWER CHOICES	RESPONSES	
Fully Support	18.75%	3
Somewhat Support	0.00%	0
Neither support nor oppose	6.25%	1
Somewhat oppose	12.50%	2
Fully oppose	62.50%	10
TOTAL		**16**

26. Please provide any additional comments or suggestions for Clean & Efficient Transportation measures.

Answered: 8

Skipped: 0

Left Blank: 11

All items should not be mandatory. Items should be incentivised and voluntary.
11/01/2024 7:11 AM

Zero emission vehicles don’t poison our air and should be valued beyond just GHG emissions and energy costs. Pedestrians and bikers are breathing tailpipe emissions, but it doesn’t have to be that way.
09/01/2024 6:38 PM

This all cost too much. No rich people driving electric vehicles should get free electricity from anyone.
08/08/2024 2:19 PM

Would love to see energy efficient buses with racks for bikes etc following routes throughout encinitas to get families to downtown and beaches
08/07/2024 1:58 PM

Again, I'm not in favor of any mandatory or required actions as directed by a Government that is way too bloated.
08/06/2024 11:55 AM

Opinions influenced by cost.
07/26/2024 1:08 PM

Encourage and facilitate virtual format for city meetings and public hearings.
07/25/2024 8:24 PM

The federal government has spent how many billions to create 8 charging stations. Please, just FIX THE POTHOLES. If you can get that basic job of city government accomplished then maybe you could move on to moving the homeless encampment out of our parks per the recent Supreme Court decision.

07/25/2024 8:08 PM

27. OR-1: Limit Use of Gas-Powered Leaf Blowers

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	2
Somewhat Support	2
Neither support nor oppose	2
Somewhat oppose	1
Fully oppose	9

ANSWER CHOICES	RESPONSES	
Fully Support	12.50%	2
Somewhat Support	12.50%	2
Neither support nor oppose	12.50%	2
Somewhat oppose	6.25%	1
Fully oppose	56.25%	9
TOTAL		**16**

28. OR-2: Limit Use of Gas-Powered Landscape Equipment

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	3
Somewhat Support	1
Neither support nor oppose	1
Somewhat oppose	2
Fully oppose	9

ANSWER CHOICES	RESPONSES	
Fully Support	18.75%	3
Somewhat Support	6.25%	1
Neither support nor oppose	6.25%	1
Somewhat oppose	12.50%	2

Answer	Responses	
Fully oppose	56.25%	9
TOTAL		**16**

29. Please provide any additional comments or suggestions for Off-Road Equipment measures.

Answered: 10

Skipped: 0

Left Blank: 9

These items should not be mandatory for hardship reasons of gardeners.
11/01/2024 7:11 AM

Gas-powered leaf blower ban should be continued - and enforced. Phase out other gas-powered equipment. This requires training and assistance for landscapers.
09/01/2024 6:38 PM

This is minor compared to other pollutants such as electric car batteries that are forever polluters.
08/08/2024 2:19 PM

Come on . This is not an effective idea. More bang for buck in providing buses for school children and asking everyone not to drive their kids to and from school.
08/08/2024 8:55 AM

Is this really going to make any significant difference in CO2 emissions? . Lay off this one and leave the immigrant owned landscapers and others who do necessary work alone.
08/08/2024 8:36 AM

Don't like the word "limit". Sounds like a Government euphemism for "required" or "mandatory".
08/06/2024 11:55 AM

These are not really useful
08/05/2024 3:52 PM

This does nothing except inconvenience mostly immigrant landscapers .
08/05/2024 3:49 PM

I thought gas-powered leaf blowers were already banned, although I see lots of them in use.
07/25/2024 8:24 PM

Leave us alone and FIX THE POTHOLES. Your Santa Fe drive mess is a clear illustration that fixing the potholes will be challenge enough for this city.
07/25/2024 8:08 PM

30. ZW-1: Implement a Zero Waste Program

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	3
Somewhat Support	1
Neither support nor oppose	6
Somewhat oppose	2
Fully oppose	4

ANSWER CHOICES	RESPONSES	
Fully Support	18.75%	3
Somewhat Support	6.25%	1
Neither support nor oppose	37.50%	6
Somewhat oppose	12.50%	2
Fully oppose	25.00%	4
TOTAL		**16**

31. Please provide any additional comments or suggestions for Zero Waste measures.

Answered: 5Skipped: 0Left Blank: 14

Should not be mandatory.
11/01/2024 7:11 AM

Not really sure this is practical for sanitary reasons
08/08/2024 2:19 PM

Fine with this as long as its not mandatory.
08/06/2024 11:55 AM

Make recycling far easier and more convenient. Case in point: Smart & Final and Lazy Acres do not accept plastic bags for recycling, which I thought was a city requirement. Trash receptacles at Orpheus Park are a joke -- recyclables inserted in the holes in the top level fall right through to the trash bin in the bottom.
07/25/2024 8:24 PM

I think you already know.....
07/25/2024 8:08 PM

32. CS-1: Establish a Tree Canopy Goal for the City

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	5
Somewhat Support	5
Neither support nor oppose	5

Answer	Responses
Somewhat oppose	0
Fully oppose	1

ANSWER CHOICES	RESPONSES	
Fully Support	31.25%	5
Somewhat Support	31.25%	5
Neither support nor oppose	31.25%	5
Somewhat oppose	0.00%	0
Fully oppose	6.25%	1
TOTAL		**16**

33. CS-2: Enforce Landscape Tree Requirements at New Developments

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	4
Somewhat Support	3
Neither support nor oppose	2
Somewhat oppose	2
Fully oppose	5

ANSWER CHOICES	RESPONSES	
Fully Support	25.00%	4
Somewhat Support	18.75%	3
Neither support nor oppose	12.50%	2
Somewhat oppose	12.50%	2
Fully oppose	31.25%	5
TOTAL		**16**

34. CS-3: Incentivize Tree Planting on Private Property

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	7

Answer	Responses
Somewhat Support	1
Neither support nor oppose	5
Somewhat oppose	1
Fully oppose	2

ANSWER CHOICES	RESPONSES	
Fully Support	43.75%	7
Somewhat Support	6.25%	1
Neither support nor oppose	31.25%	5
Somewhat oppose	6.25%	1
Fully oppose	12.50%	2
TOTAL		**16**

35. MCS-1: Plant and Maintain City Trees

Answered: 16

Skipped: 0

Left Blank: 3

Answer	Responses
Fully Support	8
Somewhat Support	2
Neither support nor oppose	5
Somewhat oppose	1
Fully oppose	0

ANSWER CHOICES	RESPONSES	
Fully Support	50.00%	8
Somewhat Support	12.50%	2
Neither support nor oppose	31.25%	5
Somewhat oppose	6.25%	1
Fully oppose	0.00%	0
TOTAL		**16**

36. Please provide any additional comments or suggestions for Carbon Sequestration measures.

Answered: 6Skipped: 0Left Blank: 13

Nothing should be mandatory.
11/01/2024 7:11 AM

Beyond just "planting trees", we need native plant communities. Refer to Miyawaki-style afforestation for a blueprint for resilient mini-forests (1000 sf +) that are completely self-sustaining within three years. The climate and environmental benefits of native plant communities are supercharged compared to isolated street trees. Curb cuts and other ways of capturing urban runoff can ensure these areas thrive.
09/01/2024 6:38 PM

Trees are fine, but let's not pretend we are going to be like Amazon rainforest
08/08/2024 8:55 AM

Trees are life
08/07/2024 1:58 PM

I'm fine with this as long as its not mandatory.
08/06/2024 11:55 AM

Stop promoting defoliating high-density residential construction.
07/25/2024 8:24 PM

37. Please select your top climate adaptation concerns

Answered: 15

Skipped: 0

Left Blank: 4

Answer	Responses
Extreme Heat Events	5
Drought Events	5
Increased Wildfire Risk	5
Increase Likelihood of Flooding	2
Sea Level Rise	3
Loss of Biodiversity	2
Other	4

ANSWER CHOICES	RESPONSES	
Extreme Heat Events	19.23%	5
Drought Events	19.23%	5
Increased Wildfire Risk	19.23%	5
Increase Likelihood of Flooding	7.69%	2
Sea Level Rise	11.54%	3
Loss of Biodiversity	7.69%	2
Other	15.38%	4
TOTAL		**26 (15 answered)**

38. Are there any existing or potential climate equity concerns that you are aware of within the community?

Answered: 9Skipped: 0Left Blank: 10

No stop wasting taxpayer money please
11/07/2024 7:36 PM

Incentive programs and funding should prioritize Communities of Concern.
10/25/2024 4:24 PM

A lot of these ideas are those of upper class people. Please consider the cost impact of working class people
08/08/2024 8:55 AM

Yes. In terms of equity, I think you must be careful in imposing costly mandates on working people . Those with resources can do what they wish with EVs, etc.
08/08/2024 8:36 AM

All your proposed concerns are bogus. The vast majority of the small climate change that we're experiencing is natural and not anthropogenic. Therefore, it is not controllable by humans. This is a fools erand.
08/06/2024 11:55 AM

???
08/05/2024 3:54 PM

Not sure what that means.
08/05/2024 3:52 PM

Fire insurance premiums in much of the city.
07/25/2024 8:24 PM

Utter and complete pablum. Equity=Inanity
07/25/2024 8:08 PM

39. Please provide any additional comments.

Answered: 10Skipped: 0Left Blank: 9

Stop with these bogus initiatives- you see how the overzealous plastic bag ban cause more plastic in the landfills by weight. And there’s no accountability just leave people alone and enforce laws where people are shitting and pissing along the rail trail and other parts where they parked overnight and causing litter and human feces and urine enforce that before you tell people what kind of trees they can plant on their property
11/07/2024 7:36 PM

Sinking storm water has a tremendous potential to nurture carbon sinks and stabilize climate factors, as well as reduce pollution. Water vapor is a greenhouse gas just like CO2! Keeping it in the ground instead of evaporating is a climate solution. Urban and suburban landscapes have disturbed water cycles and led to desertification and vulnerability to flooding and heat. This is fixable! Slow it, spread it, sink it, and help the climate.
09/01/2024 6:38 PM

Support nuclear plant construction
08/08/2024 8:55 AM

Please do not raises taxes for these programs. High enough already and a burden to working people. Please don’t pretend that everybody has the same economic means in the community.
08/08/2024 8:36 AM

Thanks for doing this. We all need to do what we can to save our planet
08/07/2024 1:58 PM

Most of this CAP is a waste of my tax dollars. How many city staffers are involved in the development, planning and execution of this? All but a few should be fired and the tax dollars redirected to something that is meaningful or rebated to the taxpayers.
08/06/2024 11:55 AM

The financial requirements for living in Encinitas are great. While many of the foregoing ideas are laudatory, my concern is their implementation would further exclude current and future residency.
07/26/2024 1:08 PM

Don't force expensive retrofits. Consider the carbon and other environmental impacts of scrapping existing equipment and manufacturing new. Make e-waste, battery, and plastics recycling of all types much more convenient.
07/25/2024 8:24 PM

Please please please stop the nonsense and just take care of the business of a city. Keep the streets maintained, keep the citizens safe from crime and leave us the heck alone. Respectfully submitted by an overly taxed citizen with a different and sane perspective. Happy to talk about it any time.
07/25/2024 8:08 PM

Appendix F

Methods for Estimating Greenhouse Gas Emissions

Methods for Estimating Greenhouse Gas Emissions and Emissions Reductions

March 2025

Prepared for the City of Encinitas

Prepared by the Energy Policy Initiatives Center

About EPIC

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1 OVERVIEW

This Appendix provides a summary of the 2016 greenhouse gas (GHG) emissions inventory for the City of Encinitas (referred to as "Encinitas" or "the City"), the business-as-usual (BAU) emissions projections through 2045, and the methods used to calculate the GHG emissions reductions from the measures included in the city's Climate Action Plan (CAP) Update.

This Appendix includes the following sections:

- Section 2 describes the background data sources used for this Appendix;
- Section 3 provides the 2016 GHG emissions inventory results summary;
- Section 4 provides a summary of the emissions projections for 2030 and 2045, and the methods used to prepare projections for each emissions category;
- Section 5 describes this CAP Update's 2030 and 2045 targets;
- Section 6 provides a summary of emissions impacts from federal, State (California), and local CAP strategies; and
- Section 7 details the common data sources and methods used to estimate emissions reductions, and the methods used to estimate emissions reductions from federal, State, and CAP Update strategies.

Unless stated otherwise, all activity data, GHG emissions, and GHG emissions reductions reported in this Appendix are annual values for the calendar year, and all emission factors reported in this document are annual average values for the calendar year.

Rounding is used for the final GHG values within the tables and figures throughout the document. Values are not rounded in the intermediary steps in any calculation. Because of rounding, some totals may not equal the values summed in any table or figure.

2 BACKGROUND

2.1 Greenhouse Gases

The primary GHGs included in the City's emissions estimates are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Each GHG has a different capacity to trap heat in the atmosphere, known as its global warming potential (GWP), which is normalized relative to CO_2 and expressed in carbon dioxide equivalents (CO_2e). In general, the 100-year GWPs reported by the Intergovernmental Panel on Climate Change (IPCC) are used to estimate GHG emissions. The GWPs used in this appendix are from the IPCC Fourth Assessment Report (AR4),[1] provided in Table 1. The 100-year GWPs from AR4 are used in this appendix to be consistent with the GWPs used in the California statewide GHG inventory.[2] The latest IPCC climate assessment is the Six Assessment Report (AR6) with an updated set of GWPs.[3]

[1] IPCC Fourth Assessment Report: Climate Change 2007: Direct Global Warming Potentials (2013).
[2] CARB: Current California GHG Emission Inventory Data. 2000-2022 GHG Inventory (2024 Edition).
[3] IPCC: Six Assessment Report.

Table 1 Global Warming Potentials

Greenhouse Gas	Global Warming Potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298
IPCC 2013.	

2.2 Demographics

The San Diego Association of Governments (SANDAG) estimates and forecasts population, housing, and jobs for all jurisdictions in the San Diego region. However, a city-specific transportation modeling was performed in 2023 that supported both the City's CAP Update and the General Plan Mobility Element Update. The demographic estimates and forecasts used in the 2023 modeling are used for the CAP Update to be consistent with the transportation data.

The 2023 modeling was based on the SANDAG Activity Based Model 2+ (ABM2+) and 2021 San Diego Regional Plan scenarios that factored in regional transportation network investments and policies but adjusted to align with the City's land use assumptions. The 2016 baseline year estimates include (1) the City's adopted Housing Elements housing sites and (2) recently approved development projects in the past few years. The 2050 estimates include (1) additional housing expected to be built by 2050, (2) the Housing Element land use data, (3) potential development projects outside the Housing Element projects set to be completed by 2050, and (4) additional roadway network adjustments aligning with the Mobility Element.[4] 2050 was the only projection year included in the 2023 modeling effort, estimates between 2016 and 2050 were linearly interpolated.

The population, housing units, and jobs estimates for 2016, 2030, and 2045 are provided in Table 2.[5]

Table 2 Population, Housing, and Jobs Estimates

Year	Population	Jobs	Housing Units*
2016	76,408	29,260	30,545
2030	78,987	27,154	31,625
2045	81,751	24,897	32,782
Based on Encinitas specific land use assumptions including recently approved development projects and the adopted Housing Elements. *Housing unit types include single detached units, single attached units, two to four units, five plus or apartment units, and mobile homes. Fehr & Peers 2023, Energy Policy Initiatives Center, University of San Diego 2024			

[4] Fehr & Peers (January 9, 2024), *City of Encinitas Transportation Modeling Considerations and Results* [Memorandum].
[5] 2016 and 2050 population, housing units, and jobs estimates were provided by Fehr & Peers to EPIC (September 13, 2023). No interim year models were analyzed, therefore, 2030 and 2045 estimates were interpolated linearly between 2016 and 2050 estimates.

3 BASELINE 2016 GREENHOUSE GAS EMISSIONS INVENTORY

SANDAG created the *Regional Climate Action Planning Framework* (ReCAP) to guide CAP development and support consistent CAP implementation across the San Diego region.[6] SANDAG has supported CAP implementation monitoring through ReCAP Snapshots, the biannual reports of GHG inventory, and climate monitoring data. Encinitas received a 2016 GHG inventory (released in 2019), a 2018 GHG inventory (released in 2021), and a partial 2020 GHG inventory (released in 2023, transportation emissions were omitted due to data availability during the COVID pandemic).[7] Data year 2016 was chosen as the CAP Update baseline year, even though more recent GHG inventories are available (e.g., the 2018 GHG inventory) because 2016 has the best available vehicle miles traveled (VMT) data.

The ReCAP *Technical Appendix I: GHG Inventories, Projections, and Target Selection* document provides the GHG inventory calculation method used for all GHG inventories in the Snapshots, based on U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (U.S. Community Protocol), developed by ICLEI USA.[8] The U.S. Community Protocol requires a minimum of five basic emissions-generating activities to be included in a Protocol-compliant community-scale GHG inventory. These categories are electricity, natural gas, on-road transportation, water and wastewater, and solid waste. GHG emissions are calculated by multiplying activity data (e.g., kilowatt-hours of electricity) by an emission factor (e.g., pounds of CO_2e per unit of electricity). The activity data and emissions factors are regional- or city-specific data when available. The overall method and data sources for estimating activity and emissions factors are provided in Table 3.

Table 3 2016 Greenhouse Gas Emissions inventory Calculation Methods and Data Sources

Emission Category	Category Detail	Data Source for Estimating Activity and Emissions Factor
Electricity	Power plant emissions associated with generating electricity used within the City	Activity: Electricity sales data from San Diego Gas & Electric (SDG&E) based on customer class, rate schedule, and electric service provider (MWh) Emissions factor: Weighted average emission factor based on the electric service provider (lbs CO_2e/MWh)
Natural Gas	Combustion emissions associated with fuel end-use for heating and cooling (mostly residential and non-residential, excusing fuels used for grid use electricity production)	Activity: Sales data from SDG&E based on customer class (therms) Emissions factor: Natural gas emission factor in California from CARB statewide inventory (00545 MT CO_2e/ therm)

[6] SANDAG: Climate Action Planning Framework for Local Governments.
[7] The GHG inventories and CAP monitoring data are in SANDAG Climate Action Data Portal.
[8] SANDAG: Climate Action Planning Framework for Local Governments. ReCAP Technical Appendix I: GHG Inventories, Projections, and Target Selection (Version 1.1: October 2020). ICLEI – Local Governments for Sustainability USA: U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, Version 1.2 (2019).

Emission Category	Category Detail	Data Source for Estimating Activity and Emissions Factor
On-Road Transportation	Tailpipe emissions from on-road vehicles (passenger cars, light-duty trucks, heavy-duty trucks, buses, motorcycles, etc)	Activity: City-specific VMT using the origin-destination method (miles) Emissions factor: San Diego region emission factor by vehicle class from latest approved CARB EMFAC model (currently EMFAC2021) converted to average vehicle emission factor using VMT distribution by vehicle class (g CO_2e/mile)
Water	Emissions from energy use to deliver water to end-use customers	Activity: City-specific water use by water source (imported, local surface, and recycled water) from water districts (gallons) Emissions factor: energy intensity (kWh/gallon) and electricity emissions factor (lbs CO_2e/MWh) from water districts for each of the water cycle (supply, treatment, and distribution)
Wastewater	Fugitive and process emissions from wastewater treatment	Activity: City-specific wastewater generation from wastewater collection agency (gallons) Emissions factor: emission factor based on treatment process (MT CO_2e/gallon)
Solid Waste	End-of-life emissions associated with community waste disposal	Activity: City-specific waste disposal from CalRecycle (tons) Emissions factor: Based on regional composition study and methane recovery factor at landfills obtained from the landfill (MT CO_2e/ton)
Detailed methods and GHG emissions calculation equations are provided in SANDAG Climate Action Planning Framework for Local Governments. *ReCAP Technical Appendix I: GHG Inventories, Projections, and Target Selection* (Version 1.1: October 2020). Energy Policy Initiatives Center, University of San Diego 2024		

A few revisions were made to the original ReCAP 2016 GHG inventory due to newly available data and data sources since 2019: (1) updated VMT estimates based on the 2023 modeling,[9] (2) updated vehicle miles emission rates and off-road transportation emissions from the statewide transportation latest models, and (3) updated water emissions based on latest local water energy intensity data.

The revised GHG emissions from Encinitas in 2016 were approximately 381,000 metric tons carbon dioxide equivalent (MT CO_2e), distributed into categories as shown in Table 4 and Figure 1.

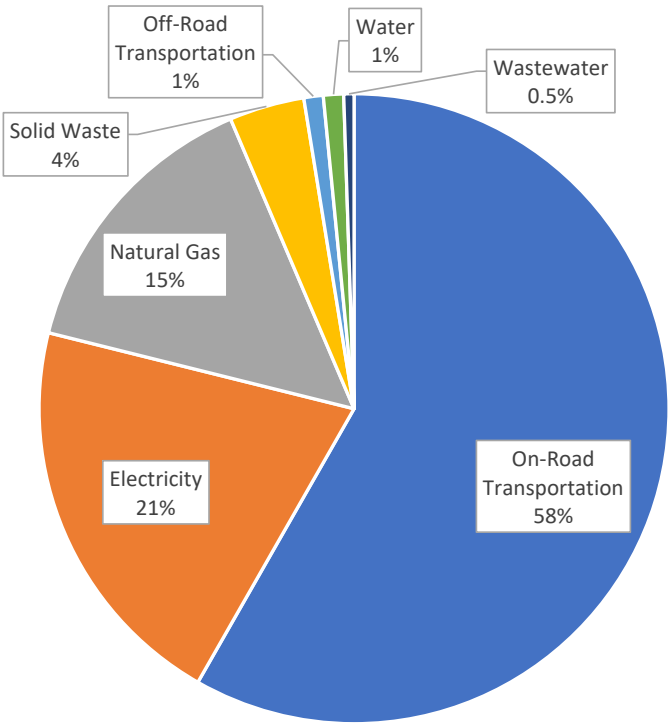
[9] 2016 and 2050 VMT estimates were provided by Fehr & Peers to EPIC (December 15, 2023). The VMT estimates were based on SANDAG ABM2+ model DS41 (ABM2+ Version 14.2.2, Series 14 Forecast, Scenario ID 469, September 2021) and city-specific land use assumptions, including Mobility Element.

Table 4 2016 Greenhouse Gas Emissions in Encinitas

Emissions Category	2016 Inventory	
	GHG Emissions ($MT CO_2e$)	Distribution (%)
On-Road Transportation	222,000	58%
Electricity	79,000	21%
Natural Gas	56,000	15%
Solid Waste	15,000	4%
Off-Road Transportation	4,000	1%
Water	4,000	1%
Wastewater	2,000	0.5%
Total	**381,000**	**100%**

Sums may not add up to totals due to rounding. GHG emissions for each category are rounded to the nearest thousand. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024



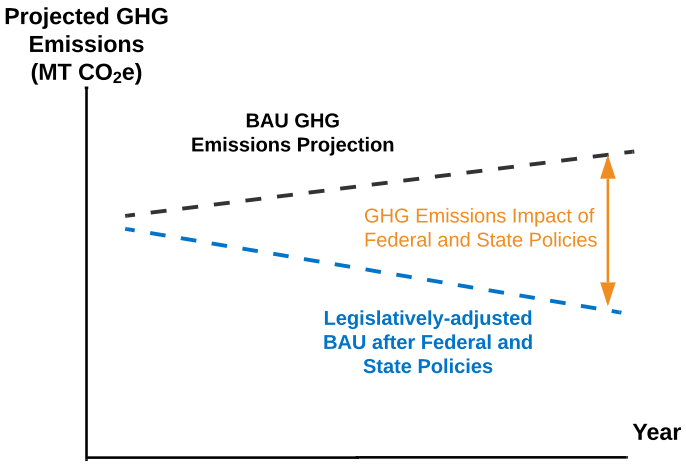
Percentage may not add to totals due to rounding.
Energy Policy Initiatives Center, University of San Diego 2024

Figure 1 2016 Greenhouse Gas Emissions in Encinitas

4 BUSINESS-AS-USUAL EMISSIONS PROJECTION

To inform the development of GHG reduction strategies within the CAP Update, GHG emissions are projected using the 2016 baseline year GHG inventory, as well as estimates for population, housing, and

job growth discussed in Section 2. This is used to develop a "business-as-usual" (BAU) projection, which demonstrates emissions growth in the absence of any new policies and programs. Next, future emissions reductions expected from applicable federal and State policies and programs are applied, creating a legislatively-adjusted BAU. Figure 2 provides an illustrative example of the difference between a BAU and a legislatively-adjusted BAU.



Energy Policy Initiatives Center, 2024

Figure 2 Example of Business-As-Usual and Legislatively-Adjusted Business-As-Usual Emissions Projections

The methods used to project activity level and emission factors for each emissions category are described in **Error! Reference source not found.**.

Table 5 Method to Project Business-as-usual Emissions

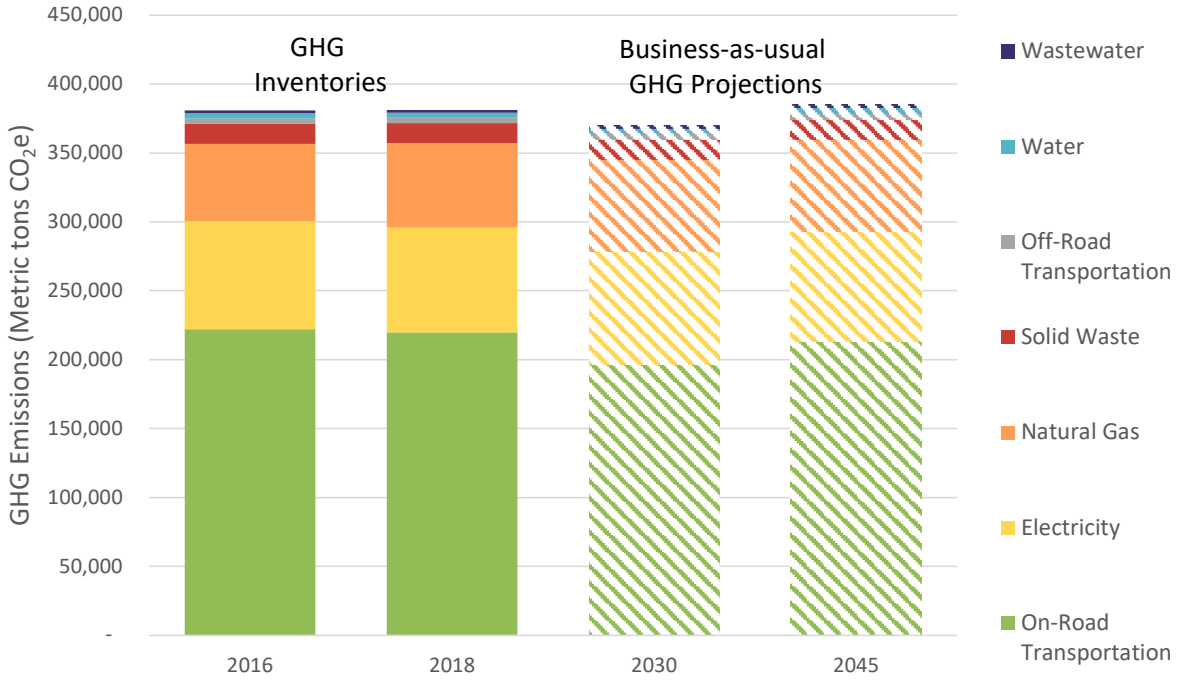
Emissions Category	Activity	Method to Project Activity Level	Emission Factor	Method to Project Emission Factor
On-Road Transportation	VMT	Direct results from 2023 transportation modeling	Average vehicle emission factor	All new vehicles have the same emission rate as new vehicles in baseline year

Emissions Category	Activity	Method to Project Activity Level	Emission Factor	Method to Project Emission Factor
Electricity	Net energy for load	Residential: Population increase Non-Residential: Jobs increase	City-specific emission factor	Fixed at the latest year with data available (2020)
Natural Gas	Natural gas end-use	Residential: Population increase Non-Residential: Jobs increase	Natural gas emission factor	0.00545 MT CO_2e/ therms
Solid Waste	Waste disposal	Population Increase	Mixed waste emission factor	0.98 MT CO_2e/short ton
Off-Road Transportation	All adopted rules included in the CARB OFFROAD2021 Model			
Water	Potable and recycled water supply	Potable water: Population increase Recycled water: Fixed at the latest year with data available (2020)	Energy intensity and electricity emission factor	Fixed at the latest year with data available (2020)
Wastewater	Wastewater generation	Population increase	Wastewater emission factor	1.37 MT CO_2e/ million gallon
Method to project business-as-usual emissions only Population, jobs, and service population are provided in Table 2 Energy Policy Initiatives Center, University of San Diego 2024				

The total BAU projected emissions are presented in Table 6 and Figure 3.

Table 6 Business-As-Usual Emissions Projections

Emissions Category	Projected GHG Emissions (MT CO_2e)	
	2030	2045
On-Road Transportation	197,000	213,000
Electricity	82,000	80,000
Natural Gas	67,000	67,000
Solid Waste	14,000	15,000
Off-Road Transportation	4,000	5,000
Water	4,000	4,000
Wastewater	2,000	2,000
Total	**370,000**	**385,000**
Sum may not add up to totals due to rounding. Projected GHG emissions for each category are rounded. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2024		



Business-as-usual GHG emissions projection with population, jobs, and housing units growth from the Encinitas Housing Element + Mobility Element Modeling, not including future impacts of adopted federal, state, or regional policies.
Energy Policy Initiatives Center, University of San Diego 2024

Figure 3 Greenhouse Gas Inventory and Business-As-Usual Emissions Projections

5 2030 AND 2045 REDUCTION TARGETS

Table 7 shows the BAU emissions projections and the 2030 and 2045 reduction targets.

As directed by Senate Bill (SB) 32 and Assembly Bill (AB) 1279, California aims to reduce annual statewide GHG emissions to (1) 40 percent below 1990 levels by 2030; and (2) 85 percent below 1990 levels by 2045, with net-zero emissions achieved through carbon dioxide removal. While the statewide targets are based on 1990 statewide GHG emissions levels, Encinitas, like most jurisdictions in California, does not have an emissions inventory from the year 1990 and must correlate a more recent inventory to 1990 levels using statewide GHG emissions data. In 2016, the California GHG emissions inventory showed that total statewide GHG emissions levels were nearly equivalent to 1990 levels. As such, it is assumed local GHG emissions have evolved on a similar trend, and 1990 total GHG emissions levels in Encinitas may be similar to those estimated in the 2016 community GHG inventory.

In alignment with the State targets, and estimating equivalent reductions needed from the 2016 baseline, the City aims to reduce emissions to: (1) 40 percent below 2016 levels by 2030 (aligned with the 2030 target in SB 32); and 85 percent below 2016 levels by 2045 (aligned with the 2045 target in AB 1279).

Table 7 Emissions Projections, Reduction Targets, and Emissions Reductions Needed

Year	Business-as-usual Projection* (MT CO_2e)	Target Emissions Level (% below baseline)	Target Emissions Level (MT CO_2e)
2016	381,000	-	-
2030	370,000	40%	229,000
2045	385,000	85%	57,000

Emissions projections and targets are rounded.
*BAU projection without impact of federal, State, regional, and local CAP Update strategies.

Energy Policy Initiatives Center, University of San Diego 2024

6 SUMMARY OF EMISSIONS REDUCTION ESTIMATES

This section summarizes the GHG emissions reductions identified for each strategy and measure included in the CAP Update. The methods used to estimate GHG emissions reductions are described in Section 7. Table 8 below presents a summary of emissions reductions from each strategy including the reductions from federal and State regulations.

Table 8 2030 and 2045 GHG Emissions Reductions by Strategy

CAP Strategies	Emissions Reductions (MT CO_2e)	
	2030	2045
Building Decarbonization	8,000	31,400
Renewable Energy	18,500	1,000
Water Efficiency	1,000	1,000
Clean and Efficient Transportation	4,800	19,200
Zero Emission Equipment	300	1,300
Zero Waste	10,400	12,700
Carbon Sequestration	4,300	5,300
Federal and State Regulations	95,300	256,500
Total Reduction*	**142,000**	**328,000**

Emissions reduction values in 2030 and 2045 are rounded. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
*The total includes values from federal, State, regional, and local CAP Update strategies.
Energy Policy Initiatives Center, University of San Diego 2024

Each strategy has several measures. Table 9 presents a detailed summary of the emissions reductions from each CAP Update measure, including each federal and State action.

Table 9 2030 and 2045 GHG Emissions Reductions by Measure

CAP Strategies	Federal and State Regulations and CAP Measures	Emissions Reductions (MT CO_2e)	
		2030	2045
Building Decarbonization	BD-1: Require Existing Residential Development Energy Efficiency	16	35
	BD-2: Require New Residential Development Decarbonization	276	733
	BD-3: Require Existing Nonresidential Development Energy Efficiency	Not Quantified	
	BD-4: Require New Nonresidential Development Decarbonization	591	2,540
	BD-5: Decarbonize Existing Buildings	7,001	28,004
	MBD-1: Implement Energy Efficiency and Decarbonization Projects at Existing Municipal Facilities	81	135
	MBD-2: Require New Municipal Facilities be All-Electric	Not Quantified	
Renewable Energy	RE-1: Maintain Membership in San Diego Community Power	18,267	0
	RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems	239	665
	MRE-1: Install Microgrids with On-site Solar and Battery Storage at Existing Municipal Facilities	0	341
	MRE-2: Require New Municipal Facilities to Install Microgrids with On-Site Solar and Battery Storage	Not Quantified	
Water Efficiency	WE-1: Support Local Water Districts' Water Conservation Efforts	955	879
	WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems	8	20
	MWE-1: Convert City-Owned Landscape to Drought Tolerant or Native Species	34	101
Clean and Efficient Transportation	CET-1: Implement the Active Transportation Plan	858	1,204
	CET-2: Implement a Flexible Fleet Program	150	62
	CET-3: Require Transportation Demand Management Programs for New Residential, Nonresidential, and Major Redevelopment Projects	1,556	3,430
	CET-4: Reduce Vehicle Miles Traveled	0	13,014
	CET-5: Improve traffic flow	1,902	1,136
	CET-4: Require Residential Electric Vehicle Charging Stations	Supporting California's Advanced Clean Car II Regulation	
	CET-5: Require Nonresidential Electric Vehicle Charging Stations		
	CET-7: Require Transportation Demand Management Programs for New Nonresidential and Major Redevelopment Projects	1,556	3,430
	MCET-1: Transition to Zero Emission Vehicle Municipal Fleet	265	288
	MCET-2: Implement a Municipal Employee Transportation Demand Management Program	62	26
	MCET-3: Install Public Electric Vehicle Charging Stations	Supporting California's Advanced Clean Car II Regulation	
	ZE-1: Limit Use of Gas-Powered Leaf Blowers	250	247

CAP Strategies	Federal and State Regulations and CAP Measures	Emissions Reductions (MT CO_2e)	
		2030	2045
Zero Emission Equipment	ZE-2: Limit Use of Gas-Powered Landscape Equipment	0	1,043
Zero Waste	ZW-1: Implement a Zero Waste Program	10,357	12,694
Carbon Sequestration	CS-1: Establish a Tree Canopy Goal for the City	4,096	4,841
	CS-2: Enforce Landscape Tree Requirements at New Developments	117	242
	CS-3: Incentivize Tree Planting on Private Property	18	71
	CS-4: Adopt and Implement a Mature Tree Ordinance	Not Quantified	
	MCS-1: Plant and Maintain City Trees	66	119
Federal and State Regulations	Federal and California Vehicle Efficiency Standards	32,249	141,869
	California Energy Efficiency Programs	2,833	2,203
	Renewables Portfolio Standard	34,137	76,716
	California Solar Policies and Programs	26,106	35,745
Total from Federal and State Regulations		95,325	256,533
Total from CAP Update Measures		47,166	71,868
Total Reduction*		**142,000**	**328,000**

*Total emissions reductions values in 2030 and 2045 are rounded. The total includes reductions from federal, State, and CAP Update measures.
Certain measures are not quantified because information on how the policies or the programs would be implemented is unknown as of the CAP development stage.

Energy Policy Initiatives Center, University of San Diego 2024

Figure 4 provides a visualization of the emissions trends through 2045.

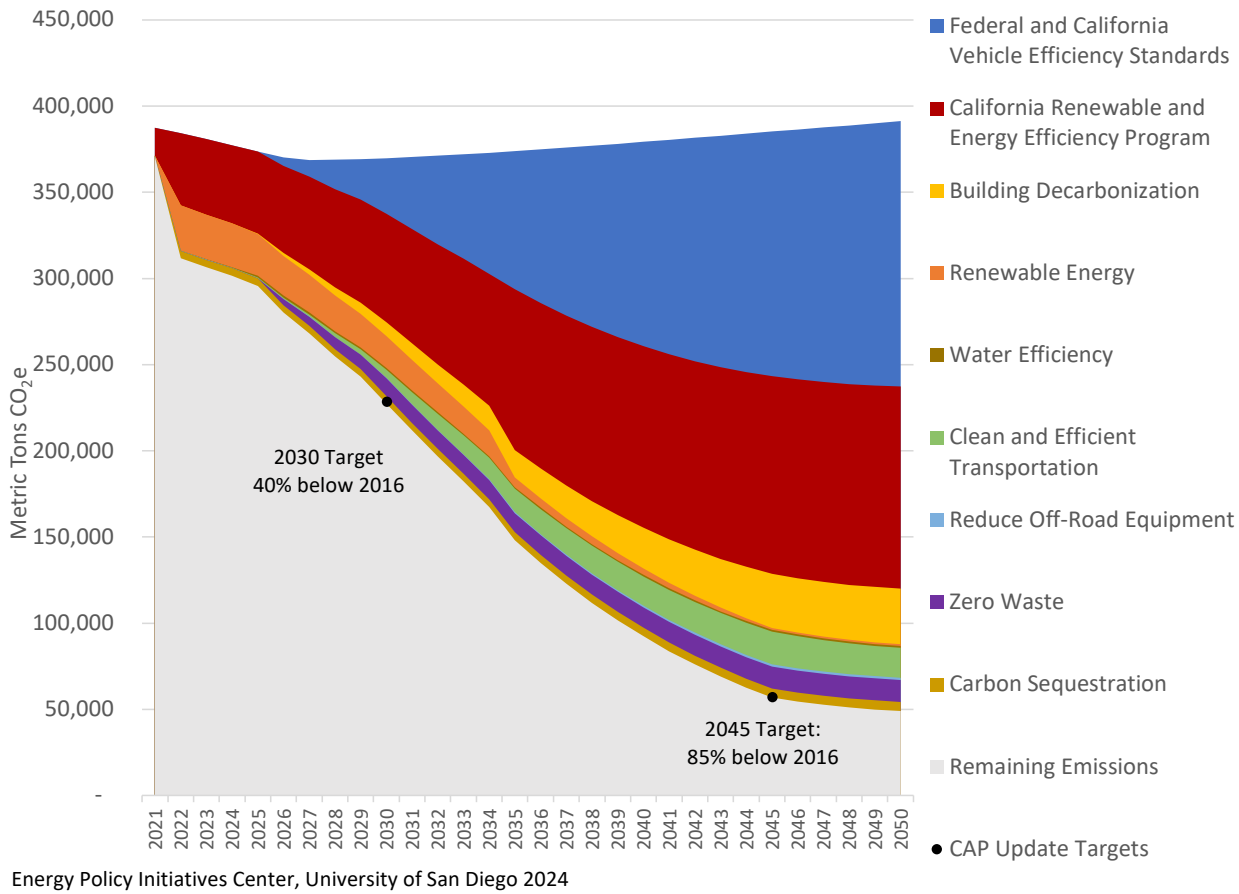


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Figure 4 Greenhouse Gas Emissions Trend (2021–2045)

In Figure 4, the colored wedges represent the reduction from each CAP Update strategy and from federal and State actions. Each wedge represents the cumulative GHG reduction from through 2045. The grey area beneath the colored wedges represents the remaining emissions after all the actions have taken place.

7 METHODS TO ESTIMATE GREENHOUSE GAS EMISSIONS REDUCTIONS

The following sub-sections describe the methods to estimate GHG emissions reductions:

- Section 7.1 through Section 7.3 discuss a set of common assumptions and sources used to calculate emissions reductions in energy and on-road transportation categories;
- Section 7.4 describes the emissions reductions from federal and State actions; and
- Section 7.5 describes the emissions reductions from the CAP Update measures.

7.1 Common Assumptions and Methods for Calculating Electricity Emissions Reductions

The following overall assumptions and methods are used in the calculation of emissions reductions related to electricity, including those from federal and State actions as well as CAP Update measures.

7.1.1 GHG Emission Factor for Electricity

The electricity emission factors in Encinitas (i.e., citywide electricity emission factors) are the weighted average emission factors of gross generation from four sources of supply: (1) San Diego Gas & Electric (SDG&E) bundled customers, the customers whom receive both electric generation and electric delivery service from SDG&E (bundled service);[10] (2) the Electric Service Providers (ESPs) for SDG&E's Direct Access (DA) customers;[11] (3) San Diego Community Power (SDCP), a Community Choice Energy program launched in 2021; and (4) behind-the-meter photovoltaic (PV) systems, the PV systems that are located on the customer's side of the utility meter.

The citywide electricity emission factors are different from the emission factors used in the GHG inventory because the electricity generated from behind-the-meter PV systems are assumed to be zero emissions and not accounted for in the GHG inventory. However, all sources are considered to estimate the effects of State actions and CAP Update measures that increase the grid-supply of renewable and zero-carbon electricity. Considering behind-the-meter PV as a source that contributes to the citywide electricity emission factor reflects the effects of energy efficiency programs that may reduce behind-the-meter electricity use, or the effects from additional electric vehicle (EV) charging load, which may come from behind-the-meter electricity sources and not just from grid supply.

The citywide electricity emission factor is calculated based on the percentage of renewable content in and the percentage of gross generation from each supply source as described below. This method is applied to 2020 onward when the projection from electricity category starts. As the percentage of renewable and zero-carbon supply in the mix increases, the citywide electricity emission factor decreases.

7.1.1.1 Supply from San Diego Gas & Electric

As of 2020, SDG&E's bundled power mix is 31% renewable.[12] It is assumed SDG&E will meet the 60% renewable by 2030, 90% renewable and zero-carbon by 2035, and 100% renewable and zero-carbon by 2045 as required by the Renewables Portfolio Standard (RPS) under SB 100 (de León) and SB 1020 (Laird).[13] Estimates in this Appendix assume that 100% renewable and zero-carbon means supplying every hour of the year with renewable and carbon-free electricity resources. The legislative mandates are discussed in detail in Section 7.4.1.

7.1.1.2 Supply from Electric Service Providers of San Diego Gas & Electric Direct Access Customers

Like SDG&E, ESP of SDG&E DA customers are required to meet RPS targets.

7.1.1.3 Supply from San Diego Community Power

SDCP, the Community Choice Energy program launched in 2021, would increase its renewable and zero-carbon electricity supply beyond the current RPS mandates. This is discussed in detail in Section 7.5.2.1.

[10] SDG&E's bundled customers are those who receive both electric generation and electric delivery service from SDG&E (bundled service). SDG&E: Customer Choice Service Types.
[11] Direct Access customers receive electric generation from Electric Service Providers (not SDG&E), but electricity is delivered by SDG&E. SDG&E: Customer Choice Service Types.
[12] SDG&E: 2020 Power Content Label.
[13] SB 100 (de León) California Renewables Portfolio Standard Program: emissions of greenhouse gases (2017–2018). The interim RPS targets are 44% by 2024 and 52% by 2027 from eligible renewable energy resources. SB 1020 (Laird) Clean Energy, Jobs, and Affordability Act of 2022 (2021-2022).

Because all of California's electricity retail sellers need to meet the RPS requirement, a portion of the emissions reduction from RPS compliance is credited to State actions. The remaining portion of reductions is attributed to CAP Update Measure RE-1: Maintain Membership in San Diego Community Power.

7.1.1.4 Supply from Behind-the-Meter Photovoltaic Systems

Electricity generation from behind-the-meter PV systems, including residential and non-residential PV, is considered part of the overall electricity supply. Electricity generation from PV is considered 100% zero-carbon (i.e., GHG-free). The State's solar policies, programs, and mandates are discussed in Section 7.4.1.1.

7.1.1.5 Citywide Electricity Emissions Factors

The citywide electricity emission factor is based on the percentage of gross generation from each supply, as well as the percentage of renewable and zero-carbon content in each supply, as shown in Equation 1.

Equation 1 Citywide Electricity Emission Factors Calculation

$$EF_{electricity,n} = \sum_{supply} \left(P_{supply,n} * \frac{\left(1 - RE_{supply,n}\right)}{\left(1 - RE_{SDG\&E,starting\ year}\right)} * EF_{SDG\&E,starting\ year}\right)$$

Where

$EF_{electricity,n}$ = Emissions factor of the electricity (gross generation) in a city in a given year, in lbs CO_2e per megawatt hour (MWh)

$P_{supply,n}$ = Gross generation supplied by an electricity supply in a given year, %

$RE_{SDG\&E,starting\ year}$ = renewable content of SDG&E supply in CAP projection starting year (2020 here), in percent.

$EF_{SDG\&E,starting\ year}$ = Electricity emission factor of SDG&E supply in CAP projection starting year (2020 here), in lbs CO_2e per MWh

With,

supply = all electricity supplies, including but not limited to SDG&E, behind-the-meter PV, San Diego Community Power **Error! Reference source not found.**

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 10 shows the contribution from each supply to gross generation, its renewable and zero-carbon content, and the overall citywide electricity emission factors for 2020, 2030, and 2045 calculated based on Equation 1.

Table 10 Encinitas Citywide Electricity Emissions Factors

Year		2020	2030	2045
San Diego Community Power	% of Gross Generation Supplied	-*	55%	54%
	Renewable and Zero-Carbon Content in Supply	-*	100%	100%
Other Electric Service Providers	% of Gross Generation Supplied	12%	9%	9%
	Renewable and Zero-Carbon Content in Supply	33%	60%	100%
SDG&E	% of Gross Generation Supplied	72%	4%	4%

	Renewable and Zero-Carbon Content in Supply	31%	60%	100%
Behind-the-meter PV	% of Gross Generation Supplied	15%	32%	33%
	Renewable and Zero-Carbon Content in Supply	100%	100%	100%
Citywide	Renewable and Zero-Carbon Content in Supply	42%	95%	100%
	Electricity Emissions Factor (lbs CO_2e/MWh)	538	50	0

*San Diego Community Power was launched in 2021.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
The overall citywide emission factors here are different from the emission factors used in the GHG inventories. The emission factors used in GHG inventories do not include behind-the-meter supplies.
2020 is the latest year with utility data available. 2030 and 2045 data are projections based on CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

In 2020, SDG&E and other electric retail suppliers supplied 85% of the projected gross generation, and behind-the-meter PV systems supplied the remainder. In 2030, the projected electricity supply from behind-the-meter PV systems is estimated to be 32% of gross generation. To comply with the mandated renewable and zero-carbon targets for 2030, the renewable content in electricity from both SDG&E and other ESPs will increase to 60%. This Appendix assumes the renewable and zero-carbon supplies from SDG&E and ESPs are fixed at the RPS mandate level to avoid overestimating the emissions reductions.

Based on the target for CAP Measure RE-1, it is assumed SDCP will have 100% renewable and zero-carbon sources by 2030. Based on these supply contributions, the citywide annual weighted electricity emission factor in 2030 is projected to be 50 lbs CO_2e/MWh (95% renewable and zero-carbon) and zero lbs CO_2e/MWh in 2045 (100% renewable and zero-carbon).

The citywide electricity emission factors are used to calculate the emissions reductions from electricity savings, as well as State actions and CAP Update measures that increase renewable supply.

7.1.2 GHG Emissions Reductions from Actions that Increase Renewables in Electricity

The projected citywide electricity emission factor is used to estimate the GHG emissions reductions from any actions that increase the overall renewable and zero-carbon supply. The total reduction from State and local CAP Update measures that increase renewable supply is given in Table 11, calculated using the projected gross generation in target years and the difference in the 2030 and 2045 citywide emissions and BAU emission factors, as shown in Equation 2.

Equation 2 GHG Emissions Reductions from Actions Increasing Renewable and Zero-Carbon Supply

$$\Delta E_{electricity,RE,n} = Elec_n * \Delta EF_{electricity,n} * 0.000453$$

Where

$\Delta E_{electricity,RE,n}$ = total emissions impact from increasing renewable and zero-carbon electricity supply in a given year, in MT CO_2e

$Elec_n$ = electricity gross generation, including all suppliers in a given year, MWh

$\Delta EF_{electricity,n}$ = difference in the projected emission factor of the electricity (gross generation) in a city in a given year compared with BAU emission factor, in pounds CO_2e per MWh

0.000453 = conversion factor, MT CO_2e in a pound

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 11 GHG Emissions Reductions from Actions Increasing Renewable and Zero-Carbon Supply

Year	Gross Generation (GWh)	BAU Projections		Projections with State and Local CAP Update Actions in Increasing Renewable and Zero-Carbon Supply		GHG Emissions Reductions from Increased Renewable and Zero-Carbon Supply (MT CO_2e)
		BAU Electricity Emission Factor (lbs CO_2e/MWh)	BAU Emissions from Electricity (MT CO_2e)	Projected Electricity Emission Factor (lbs CO_2e/MWh)	Projected Emissions from Electricity (MT CO_2e)	
2030	355	538	86,766	50	8,017	78,749
2045	455	538	110,991	0	0	110,991

The projections with increasing renewable and zero-carbon supply are based on CAP Update assumptions and State policies and programs, including the additional electric load from electric vehicles due to California's Advanced Clean Cars II regulations.

Energy Policy Initiatives Center, University of San Diego 2024

The BAU emission factor for 2020 (Table 10) is kept constant through the year 2045. The total emissions reductions from increasing renewable supply, as calculated above (Table 11), is attributed to each supply based on its renewable and zero-carbon content compared to the total renewable and zero-carbon content. This is shown in Equation 3 and Table 12.

Equation 3 Attributing Emissions Reduction to Each Supply

$$\Delta E_{electricity,supply,n} = \Delta E_{electricity,RE,n} * \left(\frac{P_{supply,n} * RE_{supply,n}}{RE_{electricity,n}}\right)$$

Where

$\Delta E_{electricity,supply,n}$ = emissions impact of an electricity supply from increasing renewable and zero-carbon content in a given year, in MT CO_2e

$\Delta E_{electricity,RE,n}$ = total emissions impact from increasing renewable and zero-carbon electricity supply in a given year, in MT CO_2e;

$P_{supply,n}$ = gross generation supplied by an electricity supply in a given year, %

$RE_{supply,n}$ = renewable and zero-carbon content of an electricity supply in a given year, %

$RE_{electricity,n}$ = overall renewable and zero-carbon content of the electricity supply (gross generation) in a given year (%);**Error! Reference source not found.**

With,

supply = all electricity supplies, including but not limited to: SDG&E, Behind-the-meter PV, CCA

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 12 GHG Emissions Reductions by Supply

Year	Electricity Supply	Total	San Diego Community Power	Other Electric Retail Suppliers	SDG&E	Behind-the-meter PV
2030	% of Gross Generation Supplied by Renewables Sources	95%	55%	6%	2%	32%
	Emissions Reduction from Increased Renewables Supply (MT CO_2e)	78,749	45,667	4,675	2,062	26,345
2045	% of Gross Generation Supplied by Renewables Sources	100%	54%	9%	4%	33%
	Emissions Reduction from Increased Renewables Supply (MT CO_2e)	110,991	60,188	9,522	4,530	36,751
2030 and 2045 data are the projections based on CAP Update assumptions and the future impact of State policies and programs. Energy Policy Initiatives Center, University of San Diego 2024						

7.2 Common Assumptions and Methods for Calculating Natural Gas Emissions Reductions

As described in Section 4, the natural gas emission factor of 0.00545 MT CO_2e per therm is used for all years to estimate the emissions reductions for the CAP Update measures that reduce natural gas use.

7.3 Common Assumptions and Methods for Calculating On-Road Transportation Emissions Reductions

The following assumptions and methods are used to calculate emissions reductions for strategies related to on-road transportation, including federal and State actions and local CAP Update measures.

7.3.1 GHG Emission Factor for On-Road Transportation

The GHG emission factor for on-road transportation is used in several ways throughout the Appendix: (1) to estimate the effect of federal and State actions that increase the vehicle fuel efficiency standard and increase zero-emission vehicles (ZEVs); and (2) the impact of VMT reduction.

7.3.1.1 Impact of Federal and State Actions on Average Vehicle Emission Rates

The latest CARB EMFAC2021 model includes the effects of federal and State regulations related to tailpipe GHG emissions reductions that were adopted by the end of 2020.[14] In August 2022, CARB adopted the Advanced Clean Cars II (ACCII) regulations that established standards for new post-2026 model year light-duty vehicles. ACCII amended: (1) the low-emission vehicle (LEV) regulations to strengthen standards for light-duty vehicles and trucks to reduce smog-forming emissions; and (2) the ZEV regulations to require an increasing number of ZEVs to meet air quality and climate change emissions standards.[15] The ZEV amendments support Governor Newsom's Executive Order N-79-20 that requires all new passenger vehicles sold in California to be ZEVs by 2035.[16]

Starting in 2026, ACCII will have a significant impact on the percentage of new ZEVs and plug-in hybrid electric vehicles (PHEVs). However, EMFAC2021 default outputs do not include the effect of ACCII. The

[14] CARB: EMFAC2021 Volume III Technical Document, Version 1.0.1 (April 2021). Section 1.3.5 Regulations and Policies includes a list of polices and regulations covered in EMFAC2021.
[15] CARB: Advanced Clean Cars II.
[16] CARB: Advanced Clean Cars II.

pending update of the EMFAC model, EMFAC202Y, will include the impact of ACCII and other light-duty and heavy-duty vehicle regulations passed after the adoption of EMFAC2021.[17]

Figure 5 shows the differences in projected ZEV and PHEV sales as required by ACCII and in EMFAC2021.

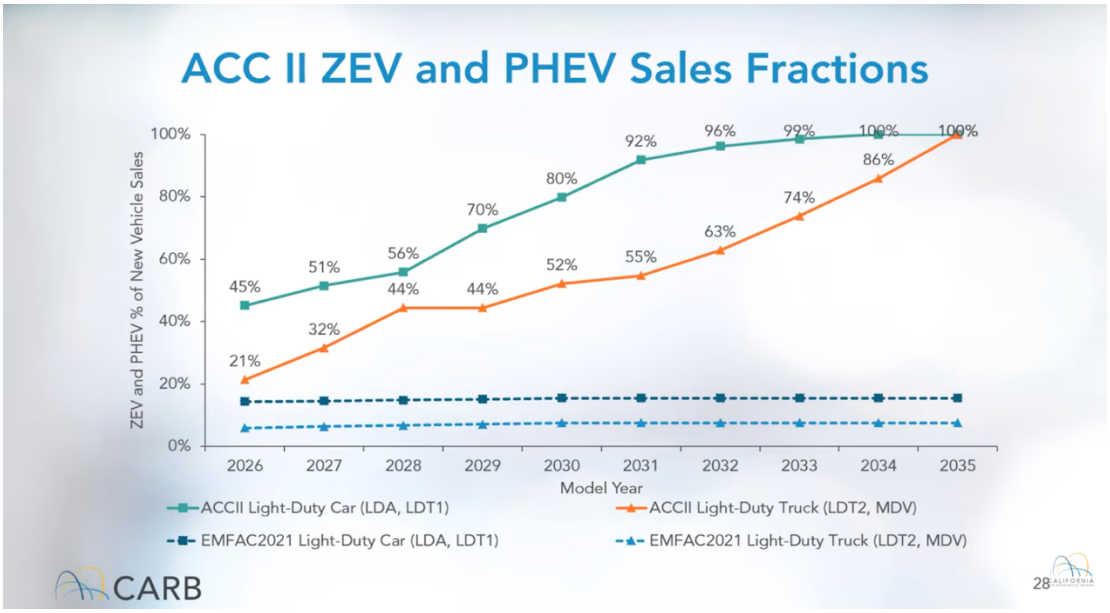


Figure 5 ACCII ZEV and PHEV Sales (Adapted from CARB October 2022 Public Workshop for the EMFAC202Y Model, Presentation Slide 28)

To estimate the impact of ACC off-model, the ACCII ZEV and PHEV sales in Figure 5 are applied to new light-duty cars trucks starting in model year 2026. For example, 45% of new light-duty cars in model and calendar year 2026 will be ZEVs and PHEVs, with the remaining light-duty cars split between gasoline and diesel.[18] Starting with model year 2035, new light-duty vehicles (both cars and trucks) will be 100% ZEVs or PHEVs.

Taking into account EMFAC2021 and ACCII regulations, the average vehicle emission rates (g CO_2e/mile) are calculated based on the distribution of VMT in each vehicle class with ACCII adjustment for light-duty vehicles, as well as the emission rate of each vehicle class. The average vehicle emission rates (Table 13) are used to estimate the GHG emissions reduction impact of federal and State policies that increase vehicle efficiency and ZEVs.

[17] CARB Presentation EMFAC202Y: An Update to California on-road Mobile Source Emissions Inventory (October 12, 2022).
[18] Based on the EMFAC2021 default gasoline-diesel cars fraction.

Table 13 Average Vehicle Emission Rate in the San Diego Region

Year	EMFAC2021 Default Results (with the Impact of all Adopted State and Federal Policies through 2020)		Adjusted EMFAC2021 Default Results with ACCII ZEV Regulations	
	Ratio of e-VMT to Total VMT (%)	Average Vehicle Emission Rate (g CO_2e/mile)	Ratio of e-VMT to Total VMT (%)	Average Vehicle Emission Rate (g CO_2e/mile)
2019	1.4%	428	1.4%	428
2030	7.7%	343	20%	303
2045	13%	296	74%	122

ACCII: Advanced Clean Cars II Regulations
e-VMT: electric vehicle miles traveled
EMFAC2021 includes all key federal and State regulations related to tailpipe GHG emissions reductions that were adopted by the end of 2020. EMFAC2021 results are adjusted to include the ACCII ZEV regulations.

CARB 2021, Energy Policy Initiatives Center, University of San Diego 2024

This Appendix assumes that the impact of ACCII in the San Diego region will be the same as its impact statewide due to the lack of regional specific data available. The additional electric load from the ZEVs and PHEVs is included in the projected gross generation in the electricity category.

7.4 Federal and State Actions that Reduce GHG Emissions in Encinitas

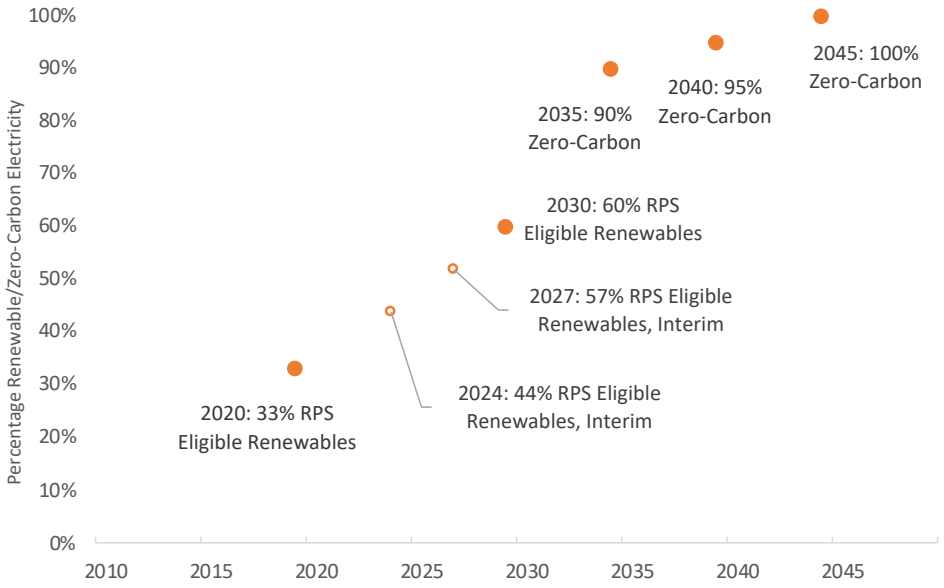
In addition to how federal and State regulations affect the emissions factors of electricity and on-road transportation, these same policies lead to significant emissions reductions in Encinitas through 2045. This section provides a summary of the methods used to estimate and attribute the emissions reductions associated with the following federal and State actions that increase renewable electricity, building energy efficiency, and clean and efficient transportation:

- California RPS – SB 100 and SB 1020
- California Solar Programs, Policies and Mandates
- California Energy Efficiency Programs
- Federal and California Vehicle Efficiency Standards

7.4.1 California Renewables Portfolio Standard

SB 100, the 100 Percent Clean Energy Act of 2018, adopts a 60 percent RPS for all of California's electricity retail sellers by 2030. SB 100 also provides goals for the intervening years before 2030 and establishes a State policy requiring that zero-carbon resources supply 100 percent of all retail electricity sales to end-user customers and all State agencies by December 31, 2045.[19] SB 1020, the Clean Energy, Jobs, and Affordability Act of 2022, adopts two interim targets for all retail electricity sales to end-use customers: 90 percent renewable and zero-carbon electricity by 2035 and 95 percent renewable and zero-carbon electricity by 2040.[20] The statewide renewable and zero-carbon targets are shown in Figure 6 below.

[19] SB 100 (de León): California Renewables Portfolio Standard Program: emissions of greenhouse gases (2017–2018). The interim RPS targets are 44 percent by 2024 and 52 percent by 2027 from eligible renewable energy resources.
[20] SB 1020 (Laird): the Clean Energy, Jobs, and Affordability Act of 2022 (2021–2022).



SB100 and SB1020 targets apply to all retail electricity providers include Direct Access, Community Choice Aggregators and Investor-Owned Utilities
Energy Policy Initiatives Center, University of San Diego 2023

Figure 6 SB 100 and SB 1020 Targets

All electricity retail sellers are required to meet the State's RPS requirements, including SDG&E, ESPs for SDG&E's DA customers, and SDCP. In this Appendix, a conservative approach is taken that assumes all sellers, including ESPs, will meet, but not surpass, the RPS requirements. Under this assumption, all emissions reductions from SDG&E and ESPs reaching 60 percent renewables in 2030 are credited to the State under the RPS requirements. In 2045, because all electricity retail sellers are required to meet the 100 percent renewable and zero-carbon requirement, all emissions reductions are credited to the State.

For SDCP, a portion of the emissions reductions in 2030 from the program will be credited to the State under RPS compliance, and the remaining reduction will be attributed to Measure RE-1, as described in Section 7.5.2.1, calculated using Equation 4. In addition, the electricity related to bring water down from the State Water Project and the Colorado River also must be renewable or zero-carbon under the mandates. Table 14 shows results from RPS mandates in target years.

Equation 4 Emission Reduction Calculation for Local Renewable Program in Compliance with RPS

$$\Delta E_{electricity,RPS,n} = \Delta E_{electricity,Local\ RE,n} * \left(\frac{RE_{RPS,n}}{RE_{local\ RE,n}}\right)$$

Where

$\Delta E_{electricity,RPS,n}$ = emissions impact of a local renewable program in a given year, in compliance with RPS, in MT CO_2e

$\Delta E_{electricity,Local\ RE,n}$ = emissions impact of local renewable program in a given year, in MT CO_2e

$RE_{RPS,n}$ = RPS requirement in a given year, fixed for RPS target years and interpolated for other years

$RE_{Local\ RE,n}$ = targeted renewable content of a local renewable program in a given year (%)

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 14 Emissions Reductions from California Renewables Portfolio Standard

Year	RPS-Related Emissions Reductions from SDG&E* (MT CO_2e)	RPS-Related Emissions Reductions from SDCP (MT CO_2e)	RPS-Related Emissions Reductions from Upstream Water-Energy Use (MT CO_2e)	Total RPS-Related Emissions Reductions (MT CO_2e)
2030	6,737	27,400	0	34,137
2045	14,053	60,188	2,476	76,716

SDCP: San Diego Community Power
*Includes SDG&E and electric service providers of SDG&E DA customers.
2030 and 2045 data are projections under the CAP based on current status, future impact of State policies and programs, and CAP Update measures assumptions.

Energy Policy Initiatives Center, University of San Diego 2024

7.4.1.1 California Solar Programs, Policies, and Mandates

California has several policies and programs to encourage customer-owned, behind-the-meter PV systems, such as the California Solar Initiative, New Solar Home Partnership, Net Energy Metering, and electricity rate structures for solar customers. The California 2019 Building Energy Efficiency Standards, which went into effect on January 1, 2020, required all newly constructed single-family homes, low-rise multi-family homes, and detached accessory dwelling units (ADUs) to have PV systems installed, unless the building receives an exception.[21] The latest California 2022 Building Energy Efficiency Standards (2022 Code), which went into effect on January 1, 2023, expanded the PV requirement to include non-residential buildings. In addition, the 2022 Code encourages efficient electric heat pumps and establishes electric-ready requirements for new residential construction.[22]

The California Energy Demand 2023–2040 Forecast, developed by the California Energy Commission (CEC), has projections for PV capacity from behind-the-meter PV adoption in the SDG&E planning area through 2040, including the impact of the residential and non-residential PV mandates.[23] The Net Billing Tariff (NEM 3.0) that went into effect in April 2023 and the federal ITC extension announced in August 2022 will have a long term an impact the behind-the-meter PV installation. This 2023–2040 forecast incorporates these policies and incentives, The Energy Demand Forecasts are updated annually, and the impacts will continue be assessed in future versions. The baseline PV projection from 2023–2040 in the SDG&E planning area is used to forecast PV generation in this Appendix.[24]

The California Distributed Generation (DG) Statistics database includes capacities of behind-the-meter PV systems interconnected in a jurisdiction in a year for each of the three Investor-Owned Utility (IOU)

[21] CEC: 2019 Building Energy Efficiency Standards – 2019 Residential Compliance Manual (December 2018). For the requirements on newly constructed single-family and low-rise multi-family homes, see Section 7.2 Prescriptive Requirements for Photovoltaic System. For the requirements on newly constructed and detached ADU, see Section 9.3.5 Accessory Dwelling Units.
[22] CEC: 2022 Building Energy Efficiency Standards.
[23] Sekar, Ashok, Paritosh Das, Ashreeta Prasanna, Michaela Sizemore, and Kevin McCabe. 2024. *Modeling Distributed Generation in California*. California Energy Commission. Publication Number: CEC-200-2024-011.
[24] CEC: California Energy Demand 2023-2040, accessed May 22, 2024.

planning areas, including SDG&E. This provides a historical record used to determine the capacity in GHG inventory years and the trends in PV installation.

A comparison of the estimated capacity and electricity generation from PV systems in Encinitas and in the SDG&E planning area is given in Table 15 and calculated based on Equation 5.[25]

Equation 5 Estimate Electricity Generation from California Solar Policies and Programs

$$Elec_{PV,local,n} = Elec_{PV,regional,n} * \left(\frac{C_{PV,local} * 18\% * 8{,}760}{Elec_{PV,regional}}\right)_{ave}$$

Where

$Elec_{PV,local,n}$	= annual electricity generation from behind-the-meter PV systems in a city in a given year, in MWh
$Elec_{PV,regional,n}$	= annual electricity generation from behind-the-meter PV systems in the SDG&E planning area in a given year, in MWh
$C_{PV,local}$	= historical capacity of the behind-the-meter PV systems in a jurisdiction in a given year, in MW (dc)
18%	= average solar system capacity factor, ratio of average energy generated compared with nameplate capacity, in MWh/MW
8,760	= hours per year
With,	
n	= a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 15 Behind-the-meter PV Capacity and Estimated Electricity Generation

Year	Encinitas*		SDG&E Planning Area**	Historical Encinitas to SDG&E Ratio of Electricity Generation from PV
	PV Capacity (MW)	Estimated Electricity Generation (GWh)	Estimated Electricity Generation (GWh)	
2019	27	43	2,049	2.1%
2020	32	51	2,438	2.1%
2021	37	59	2,776	2.1%
2022	43	68	3,141	2.2%

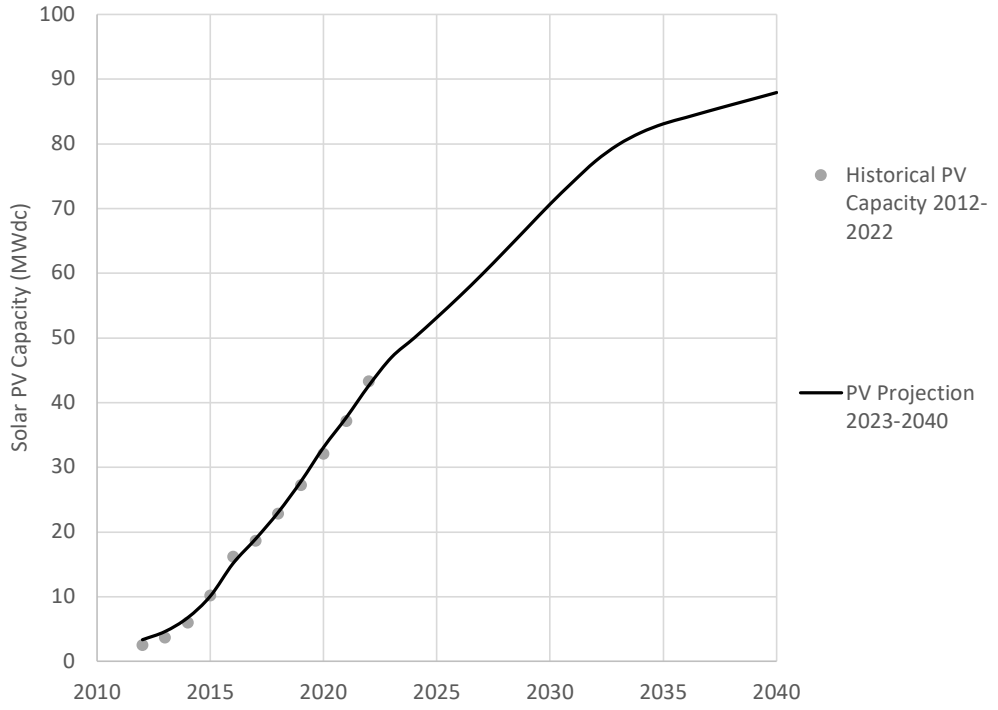
MW: megawatt; GWh: gigawatt hour
*Estimated electricity generation based on PV capacity and 18% capacity factor.
**California Energy Demand Baseline 2023–2040 Forecast

California DG Statistics 2023, CEC 2024, Energy Policy Initiatives Center, University of San Diego 2024

For future years, the electricity generation and capacity of behind-the-meter PV systems in Encinitas are estimated based on the PV generation in CEC's baseline forecast for SDG&E's planning area and the average ratio of PV generation in Encinitas to that of SDG&E's planning area from 2016–2022 (2.1%).

[25] The capacity of all interconnected PV systems in Encinitas was from the California Distributed Generation Statistics NEM Currently Interconnected Data Set (current as of March 30, 2023), download date: June 3, 2023. National Renewable Energy Laboratory: Residential PV Resources Classes, Mean DC Capacity Factor.

Because of California's solar programs, policies, and mandates, the estimated 2030 PV capacity in Encinitas is projected to be 71 megawatts (MW). The trend of behind-the-meter PV in Encinitas is shown in Figure 7.



Source of historical capacity: California Distributed Generation Statistics, 2023.
Source of capacity trend: California Energy Demand 2023-2040 Baseline Forecast in San Diego planning area (Jan 2024 version).
Energy Policy Initiatives Center, University of San Diego, 2024

Figure 7 Behind-the-meter Photovoltaic Historical Capacity and Projections

Because there are no statewide PV projections beyond 2040, this Appendix assumes that the PV capacity from State programs beyond 2035 will have an annual growth rate of 1.1 percent (the 2039–2040 growth rate, or the last year with data available) beyond 2040. The projected 2045 PV capacity from State action is approximately 92 MW.

Through CAP Measure RE-2 and Measure MRE-1, the City plans to achieve additional PV capacity citywide beyond the State requirement by 2045. This brings the projected total PV capacity in the City to 95MW in 2045.

The emissions reductions from all State and CAP measures that increase behind-the-meter renewable supply would be 26,345 MT CO_2e in 2035 and 36,751 MT CO_2e in 2045, as shown in Table 12. Total reduction is allocated based on estimated capacity (MW) that would result from each action based on Equation 6

Equation 6 Emissions Impact from Increasing Renewable Supply Through Behind-the-meter PV Systems

$$\Delta E_{electricity,PV,n} = \Delta E_{electricity,RE,n} * \left(\frac{P_{PV,n} * RE_{PV}}{RE_{electricity,n}}\right)$$

Where

$\Delta E_{electricity,PV,n}$ = emissions impact from increasing renewable supply through behind-the-meter PV systems in a given year, in MT CO_2e

$\Delta E_{electricity,RE,n}$ = total emissions impact from increasing renewable electricity supply in a given year, in MT CO_2e; refer to Equation 3

$P_{PV,n}$ = percent of gross generation supplied by behind-the-meter PV systems in a given year (%); refer to Equation 3

RE_{PV} = 100%, renewable content of PV supply

$RE_{electricity,n}$ = overall renewable content of the electricity supply (gross generation) in a given year; refer to Equation 1

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

The emissions reductions from the State action are shown in Table 16 below.

Table 16 Key Assumptions and Results from California Solar Policies, Programs, and Mandates

Year	State or City Action	Total	CAP Measure RE-2	CAP Measure MRE-1	California Solar Policies, Programs, and Mandates*
2030	Projected Behind-the-meter PV Capacity (MW)	71	0.6	Not started	71
	Projected Emissions Reduction (MT CO_2e)	26,345	239	0	**26,106**
2045	Projected Behind-the-meter PV Capacity (MW)	95	1.7	0.8	92
	Projected Emissions Reduction (MT CO_2e)	36,751	671	330	**35,750**

*Solar policies, programs, and mandates include the impact of the PV mandates from the 2019 and 2022 Building Energy Efficiency Standard.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
CAP Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems
CAP Measure MRE-1: Install Microgrids with On-site Solar and Battery Storage at Existing Municipal Facilities
The projected capacity and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.

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7.4.2 California Energy Efficiency Program

In September 2021, the CPUC adopted energy efficiency goals for ratepayer-funded energy efficiency programs (Decision 21-09-037). The adopted energy saving goals for SDG&E's service territory are given in the Decision on an annual basis from 2022 to 2032.[26] The sources of the energy savings include, but are not limited to, rebated technologies, building retrofits, behavior-based initiatives, and codes and standards.[27]

[26] CPUC: Decision 21-09-037, Adopting Energy Efficiency Goals for 2022-2032, accessed September 16, 2022. SDG&E's electricity service territory is larger than San Diego region.
[27] Guidehouse: 2021 Energy Efficiency Potential and Goals Study (April 23, 2021), accessed September 16, 2022. Rebated technologies are the energy efficiency technologies from the utility's historic incentive programs, including equipment and retrofits. Existing and future Codes and Standards included in the Study is discussed in Section 3.9 Codes and Standards.

To evaluate the impact of the energy efficiency programs in Encinitas, the total energy savings in SDG&E's service territory by 2032 are allocated to Encinitas using a ratio of Encinitas's natural gas and electricity demand to those of SDG&E's entire service territory. The average 2016–2020 ratios are 1.5 percent for electricity and 2.3 percent for natural gas.[28] SDG&E's energy efficiency goal is not estimated by the CPUC beyond 2032; therefore, it is assumed the annual electricity and natural gas savings from energy efficiency programs post-2032 will be the same as in 2032. SDG&E's service territory electricity savings were allocated accordingly to Encinitas, as shown in Table 17.[29]

Table 17 Estimated Energy Savings from California Energy Efficiency Programs

Year	Electricity Savings* (GWh)		Natural Gas Savings (million therms)	
	SDG&E Service Territory	Allocation of Savings to Encinitas by Demand	SDG&E Service Territory	Allocation of Savings to Encinitas by Demand
2032	1,914	28	18	0.4

*Includes transmission and distribution losses.
SDG&E service territory savings are the cumulative based on the 2022-2032 annual saving goals in CPUC Decision 21-09-037.

Energy Policy Initiatives Center, University of San Diego 2024

Emissions reductions from electricity savings are calculated using Equation 7 by multiplying the electricity savings by the citywide GHG emission factor for electricity, discussed in Section 7.1.1 and shown in Table 10. As the renewable and zero-carbon content in electricity increases, the emissions reductions from the electricity portion of energy efficiency programs decrease. Emissions reductions from natural gas savings were calculated using Equation 8 by the natural gas savings amount and the natural gas emission factor discussed in Section 7.2.

Equation 7 Electricity Emissions Impact from California Energy Efficiency Programs

$$\Delta E_{electricity,BE-State,n} = \Delta Elec_{BE-regional,n} * P_{electricity,Local-regional} * EF_{electricity,n} * 0.000453 - \Delta E_{electricity,BE-local,n}$$

Where

$\Delta E_{electricity,BE-state,n}$ = total emissions impact from California energy efficiency program for a city in a given year, in MT CO_2e

$\Delta Elec_{BE-regional,n}$ = electricity impact from State energy efficiency program in the SDG&E service area in a given year compared with latest historical year in MWh

$P_{electricity,local-regional}$ = ratio of the gross generation (or net energy for load) of a city to that of SDG&E service area, in CAP baseline year or average of most recent years

$EF_{electricity,n}$ = emission factor for the electricity (gross generation) in a city in a given year, in lbs. CO_2e per MWh

$\Delta E_{electricity,BE-local,n}$ = total emissions impact from CAP local building efficiency measures in a given year, if applicable, in MT CO_2e

[28] SDG&E's service territory demand is from California Energy Demand 2023-2040, accessed May 22, 2024. 2020 is the latest year with historical data available for both Encinitas and SDG&E service territory.
[29] CPUC: Decision 21-09-037, Adopting Energy Efficiency Goals for 2022-2032, accessed September 16, 2022. The 2022 and beyond goals are given on an annual basis for each year from 2022 to 2032.

0.000453 = conversion factor, MT CO_2e in a lb.

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Equation 8 Natural Gas Emissions Impact from California Energy Efficiency Programs

$$\Delta E_{NG,BE-State,n} = \Delta NG_{BE-regional,n} * P_{NG,Local-regional} * EF_{NG,n} - \Delta E_{NG,BE-local,n}$$

Where

$\Delta E_{NG,BE-state,n}$ = total emissions impact from State energy efficiency programs for a city in a given year, in MT CO_2e

$\Delta NG_{BE-regional,n}$ = natural gas savings from State energy efficiency programs in the SDG&E service area in a given year comparing with latest historical year), in therms

$P_{NG,Local-regional}$ = ratio of the natural gas use of a city to that of SDG&E ervice area, in CAP baseline year or average of most recent years

$EF_{NG,n}$ = emission factor of natural gas in a jurisdiction in a given year, in MT per therm

$\Delta E_{NG,BE-local,n}$ = total emissions impact from CAP local building efficiency measures in a given year, in MT CO_2e

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 18 summarizes the energy savings and GHG emissions reductions in the years 2030 and 2045.

Table 18 Key Assumptions and Results from California Energy Efficiency Programs

Year	Electricity Savings			Natural Gas Savings			Total GHG Emissions Reductions (MT CO_2e)
	Electricity Savings (GWh)	Emission Factor (lbs CO_2e/MWh)	GHG Emissions Reductions from Electricity Savings (MT CO_2e)	Natural Gas Savings (million therms)	Emission Factor (MT CO_2e/therm)	GHG Emissions Reductions from Natural Gas Savings (MT CO_2e)	
2030	102	50	630	0.9	0.0054	2,203	2,833
2045	102	0	0	0.9	0.0054	2,203	2,203

Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
The emission rates and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

7.4.3 Federal and California Vehicle Efficiency Standards

As discussed in Section 7.3, CARB's EMFAC2021 model includes all key federal and State regulations related to tailpipe GHG emissions reductions for both light-duty and heavy-duty vehicles that were in place by the end of 2020. EMFAC2021 results were adjusted to include ACCII ZEV regulations which require an increasing number of ZEVs for post-2026 model year light-duty vehicles. Table 19 summarizes the key assumptions and results in the years 2030 and 2045, calculated based on Equation 9.

Equation 9 Emissions Impact Calculation – Reducing Tailpipe Emissions

$$\Delta E_{transp,FE,n} = VMT_n * \Delta EF_{transp,n} * 10^{-6}$$

Where,

$\Delta E_{transp,FE,n}$ = total emissions impact in transportation category from increasing vehicle fuel efficiency and ZEVs in a given year, in MT CO_2e

VMT_n = VMT in a given year, miles per year

$\Delta EF_{transp,n}$ = difference in average vehicle emission factor in a given year and BAU average GHG emission factor, in grams CO_2e per mile

10^{-6} = conversion factor, MT per gram CO_2e

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 19 Federal and California Vehicle Efficiency Standards

Year	Projected Encinitas VMT (million miles per year)	BAU Projection with No Regulatory Impacts		With Impact of Adopted Regulations Through 2020 and ACCII ZEV Regulations		GHG Emissions Reductions (MT CO_2e)
		Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions from On-Road Transportation (MT CO_2e)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions from On-Road Transportation (MT CO_2e)	
2030	542	363	196,692	303	164,443	32,249
2045	587	363	213,207	122	71,339	141,869

Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
ACCII: Advanced Clean Cars II Regulation
ZEV: zero-emission vehicles
The emission rates and emissions reductions are projected based on CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

7.5 Climate Action Plan Update Measures

The following section describes the methods used to estimate the GHG reductions from the CAP Update measures, which are organized into the following seven strategies:

- Building Decarbonization
- Renewable Energy
- Water Efficiency
- Clean and Efficient Transportation
- Zero Emission Equipment
- Zero Waste
- Carbon Sequestration

7.5.1 Building Decarbonization

7.5.1.1 Measure BD-1: Require Existing Residential Development Energy Efficiency

The City adopted Ordinance No. 2022-13, on October 26, 2022, requiring all additions and alterations for single- and multi-family with a building permit valuation of or higher than $50,0000 to include at least one energy efficiency measure, such as attic insulation and air sealing, duct sealing, wall insulation, heat pump water heater, induction cooktop.[30] The requirements apply to the entire residential unit, not just the addition or altered portion. Since Ordinance adoption, on average 35 applications were submitted per year, all single-family homes.[31] For this Measure, it is assumed the trend will continue once the City readopts the Ordinance for each three-year State Building Code cycle.

The energy (both electricity and natural gas) savings for a typical cost-effective energy retrofit activity vary by project. Based on the Ordinance implementation data, a homeowner/permit applicant typically selects two energy efficiency measures out of all the listed options.[32] The estimated energy savings from this Ordinance are 535 kWh and 8 therms for a typical home.[33] The GHG emissions reductions from electricity and natural gas savings due to the Ordinance are calculated using Equation 10 and Equation 11, and summarized in Table 20 and Table 21.

Equation 10 Emissions Impact from Electricity Savings – Local Energy Efficiency Program

$$\Delta E_{electricity,CAP\ measure,n} = \sum_{unit} (N_{unit,n} * \Delta Elec_{unit,n}) * EF_{electricity,n} * 0.000453$$

Where

$\Delta E_{electricity,CAP\ measrue,n}$	= total emissions impact in electricity category from residential energy retrofits electricity savings, in a given year, in MT CO_2e
$N_{unit,n}$	= number of housing units (projects) over the threshold that are required to implement energy retrofit activities. after ordinance effective year to year n
$\Delta Elec_{unit,n}$	= average annual electricity savings from energy retrofits, kWh
$EF_{electricity,n}$	= emission factor of the electricity (gross generation) in a city in a given year, in lbs. CO_2e per MWh
0.000453	= conversion factor, MT CO_2e in a lb.

With,

n	= a CAP horizon year, from ordinance effective year to CAP horizon end year
unit	= including, but not limited to: retrofitted single-family unit, retrofitted multi-family unit

[30] Encinitas: Single-family Green Building Checklist and Multifamily Green Building Checklist (September, 2024). For the energy efficiency measures, the single-family requirements are listed in Table 150.2-E and the multifamily requirements are listed in Table 180.5-A.
[31] 2022 and 2023 ordinance implementation data were provided by the city to EPIC (May 2024).
[32] The most common ones selected are duct sealing, LED lamps, and cool roof, based on building permit data.
[33] California Energy Codes & Standards: 2022 Single Family Retrofits Study Data. Energy savings are based on the average energy savings from each energy efficiency measure listed, Encinitas climate zone, and the housing stock in each building vintage bracket in Encinitas. Only single-family data energy savings data are used because no multi-family applications went submitted since the Ordinance adoption.

Table 20 Electricity Savings from Measure BD-1: Require Existing Residential Development Energy Efficiency

Year	Number of Home Energy Retrofits Since the Ordinance Adoption in 2022	Electricity Savings per Retrofit* (kWh/home/year)	Total Electricity Savings from All Retrofits (kWh/year)	Electricity Emission Factor (lbs CO_2e/MWh)	GHG Emissions Reductions from Electricity Savings (MT CO_2e)
2030	303	535	161,960	50	4
2045	828	535	442,583	0	0

*Energy savings are based on the average of single-family energy retrofit activities required by the Ordinance
The projected retrofits and emissions reductions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

Equation 11 Emissions Impact from Natural Savings – Local Energy Efficiency Program

$$\Delta E_{NG,CAP\ measure,n} = \sum_{unit} (N_{unit,n} * P_{audits-retrofits} * \Delta NG_{unit,n}) * EF_{NG,n}$$

Where

$\Delta E_{NG,CAP\ measure,n}$ = total emissions impact in natural gas category from residential energy retrofits natural gas savings, in a given year, in MT CO_2e

$N_{unit,n}$ = number of housing units (projects) over the threshold that are required to implement energy retrofit activities, after ordinance effective year n

$\Delta NG_{unit,n}$ = average annual natural gas saving from energy retrofits, therms

$EF_{NG,n}$ = emission factor of the natural gas in a city in a given year, in MT per therm

With,

n = a CAP horizon year, from ordinance effective year to CAP horizon end year

unit = including, but not limited to: retrofitted single-family unit, retrofitted multi-family unit

Table 21 Natural Gas Savings from Measure BD-1: Require Existing Residential Development Energy Efficiency

Year	Number of Home Energy Retrofits Due the Requirements Starting 2026	Natural Gas Savings per Retrofit* (therms/home/year)	Total Natural Gas Savings from All Retrofits (therms/year)	Natural Gas Emission Factor (MT CO_2e/therm)	GHG Emissions Reductions from Natural Gas Savings (MT CO_2e)
2030	303	8	2,320	0.0054	13
2045	828	8	6,340	0.0054	35

*Energy savings are based on the average of single-family energy retrofit activities required by the Ordinance
The projected retrofits and emissions reductions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

By adding the totals in Table 20 and Table 21, the GHG emissions reductions from Measure BD-1 are 16 MT CO_2e in 2030 and 35 MT CO_2e in 2045.

7.5.1.2 Measure BD-2: Require New Residential Development Decarbonization

The City adopted Ordinance No. 2024-04, on June 12, 2024, requiring that certain new residential projects meet higher energy performance standards than otherwise allowed under the State Energy Code, and that all residential buildings that are plumbed for natural gas be made ready for future conversion to electric equipment. To prevent climate pollution and reduce costs, it is recommended that project applicants consider an all-electric design for their project.[34] New single-family homes, duplexes, and townhomes and low-rise multifamily projects must meet the higher energy performance standards.

Based on the 2022 new construction cost-effectiveness studies, the cost-effectiveness of a code-compliant home meeting higher energy performance standards varies by Climate Zone. Table 22 shows the natural gas savings and the additional electricity demand in Climate Zone 7 where Encinitas is located.[35]

Table 22 Assumptions of All-Electric Homes

All Electric Home Type	Single-Family	Mult--Family
Natural Gas Savings Compared with Mixed-Fuel Home (therms per unit)	69	102
Additional Electricity Added Compared with Mixed-Fuel Home (kWh per unit)	1,293	704
Based on prototypes in the cost-effectiveness study. For new single-family homes, the base case is modeled based on electric heat pump water heater with natural gas cooking and clothes drying. For new multi-family homes, the base case is modeled based on a natural gas centralized boiler with solar thermal, and electric cooking and clothes drying. California Statewide Reach Codes Program, 2023 and 2024		

The number of new single-family and multi-family units projected through 2045 are based on the housing projections described in Section 2.2. It is assumed that on average 75% of new homes will opt for all-electric option with the higher energy performance standard requirements. The emissions reduced from natural gas savings and emissions added from electricity use are shown in Table 23 and Table 24, calculated using equations similar to Equation 10 and Equation 11.

[34] Encinitas: New Construction Energy Regulations (September 2024).
[35] California Energy Codes & Standard Reach Codes Program: 2022 Single Family New Construction Cost-Effectiveness Study (April 26, 2024), accessed May 2024; and 2022 Multifamily New Construction Cost-Effectiveness Study (June 20, 2023), accessed September 2023.

Table 23 Electricity Added from Measure BD-2: Require New Residential Development Decarbonization

Year	Single-Family Homes		Multi-Family Homes		Total		
	Number of New All-electric Home Due to the Reach Code*	Electricity Added due to All-Electric (kWh/home/year)	Number of New All-electric Homes Due to Reach Code*	Electricity Added due to All-Electric (kWh/home/year)	Total Electricity Added (MWh/year)	Electricity Emission Factor (lbs CO_2e/MWh)	Emissions Added from Additional Electricity Use (MT CO_2e)
2030	133	1,293	426	704	172	50	11
2045	340	1,293	1,087	704	439	0	0

*It is assumed that on average 75% of new residential construction will opt for all-electric option with the reach code
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
The projected emissions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

Table 24 Natural Gas Savings from Measure BD-2: Require New Residential Development Decarbonization

Year	Single-Family Homes		Multi-Family Homes		Total		
	Number of New All-electric Home Due to the Reach Code*	Natural Gas Savings due to All-Electric (therms/home/year)	Number of New All-electric Homes Due to Reach Code*	Natural Gas Savings due to All-Electric (therms/home /year)	Total Natural Gas Savings (million therms/year)	Natural Gas Emission Factor (MT CO_2e/therm)	Emissions Reductions from Natural Gas Savings (MT CO_2e)
2030	133	69	426	102	0.1	0.00545	287
2045	340	69	1,087	102	0.1	0.00545	733

*It is assumed that on average 75% of new residential construction will opt for all-electric option with the reach code
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
The projected emissions reductions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

Combining the totals from Table 23 and Table 24, the net GHG emissions reductions from Measure BD-2 are 276 MT CO_2e in 2030 and 733 MT CO_2e in 2045.

7.5.1.3 Measure BD-3: Require Existing Nonresidential Development Energy Efficiency

The City adopted Ordinance No. 2022-14, on October 26, 2022, requiring certain existing nonresidential buildings with steel framing to maximize energy efficiency to avoid thermal bridging, based on the 2019 California Green Building Standards Code (CalGreen).[36] Because this requirement is not feasible under the most recent (2022) building code, the City will consider and readopt new nonresidential development energy efficiency requirements for the next building code cycle. This measure is currently not quantified for GHG reduction because, given the timing of the final 2025 CalGreen code being available for analysis, it is too soon to determine if there is a cost-effective alternative reach code option.

[36] Encinitas: Nonresidential Building Energy Efficiency Regulations (September 2024).

7.5.1.4 Measure BD-4: Require New Nonresidential Development Decarbonization

The City will consider and adopt new nonresidential building code requirements to meet a higher energy performance standard as approved by the State after the next 2025 Energy Code is enforced. Similar to Measure BD-2, it would be recommended that project applicants consider an all-electric design for their project.

The cost-effectiveness of the next rounds of reach codes (2025 reach codes) are not available. Based on the latest 2022 new construction nonresidential cost-effectiveness studies, the cost-effectiveness of a code-compliant non-residential development meeting higher energy performance standards varies by Climate Zone. Natural gas savings and additional electricity use are calculated on a per-gross floor area basis. Table 25 shows the results for different nonresidential building types and the average.[37]

Table 25 Assumptions of All-Electric Nonresidential Development

Nonresidential Building Type	Building Size (sq. ft.)	Electricity Added Compared with Mixed-Fuel Development (kWh/year)	Natural Gas Savings Compared with Mixed-Fuel Development (therms/year)	Electricity Added Compared with Mixed-Fuel Development (kWh/year/sq. ft.)	Natural Gas Savings Compared with Mixed-Fuel Development (therms/year/sq. ft.)
New Construction Medium Office	53,628	15,005	747	0.28	0.01
New Construction Small Hotel	42,554	166,238	9,977	3.91	0.23
Average of New Nonresidential Construction				2.09	0.12

The 2022 nonresidential new construction cost effectiveness study includes medium retail as a building type; however, the base case already assumes heat pumps for heating and cooling and an electric resistance water heater, so it is not included.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

The average of nonresidential building types is used here, though other types of buildings (e.g., restaurants) have a different energy use on a per-sq. ft. basis and are not captured here. Based on building permit data in the recent years, an annual average of approximately 250,000 sq. ft. of new nonresidential developments would be subject to this reach code.[38] The emissions reductions from natural gas savings and from additional electricity use due to Measure BD-4 are summarized in Table 26 and Table 27, calculated using equations similar to Equation 10 and Equation 11.

[37] California Energy Codes & Standard Reach Codes Program: 2022 Non-Residential New Construction Cost-Effectiveness Study (March 24, 2023), accessed September 2023.
[38] 2017-2022 building permit data were provided by the city to EPIC (May 2024).

Table 26 Natural Gas Savings from Measure BD-4: Require New Nonresidential Development Decarbonization

Year	Annual Nonresidential Developments Subject to Reach Code (sq. ft./year)	Total All-Electric Nonresidential Developments Due to the Reach Code* (sq. ft.)	Natural Gas Savings (therms/sq. ft./year)	Total Natural Gas Savings (therms/year)	Natural Gas Emission Factor (MT CO_2e/therm)	GHG Emissions Reductions from Natural Gas Savings (MT CO_2e)
2030	250,000	937,500	0.12	116,430	0.0054	635
2045	250,000	3,750,000	0.12	465,721	0.0054	2,540

*It is assumed that on average 75% of new non-residential construction will opt for all-electric option with the reach code
The projected emissions reductions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

Table 27 Electricity Added from Measure BD-4: Require New Nonresidential Development Decarbonization

Year	Annual Nonresidential Developments Subject to Reach Code (sq. ft./year)	Total All-Electric Nonresidential Developments Due to the Reach Code* (sq. ft.)	Electricity Added (kWh/sq. ft./year)	Total Electricity Use (kWh/year)	Electricity Emission Factor (lbs CO_2e/MWh)	GHG Emissions Increase from Additional Electricity Use (MT CO_2e)
2030	250,000	937,500	2.09	1,962,336	50	44
2045	250,000	3,750,000	2.09	7,849,344	0	0

*It is assumed that on average 75% of new non-residential construction will opt for all-electric option with the reach code
The projected emissions reductions are the projections under the CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

The net GHG emissions reductions from Measure BD-4 are 591 MT CO_2e in 2030 and 2,540 MT CO_2e in 2045.

7.5.1.5 Measure BD-5: Decarbonize Existing Buildings

The goal of Measure BD-5 is to decarbonize existing buildings that are not subject to the reach code requirements described under the measures above. The goal is to reduce 50 percent of the 2016 baseline natural gas use by 2045 through retrofitting existing buildings. Emissions reductions were calculated using the natural gas savings and the natural gas emission factor discussed in Section 7.2. Table 28 summarizes the key assumptions and results.

Table 28 Key Assumptions and Results from Measure BD-5: Decarbonize Existing Buildings

Year	Baseline 2016 Natural Gas Use (million therms/year)	Natural Gas Savings (%)	Natural Gas Savings (million therms/year)	Natural Gas Emission Factor (MT CO_2e/therm)	GHG Emissions Reductions (MT CO_2e)
2030	7.0	13%	1.3	0.00545	7,001
2045	7.0	50%	5.1	0.00545	28,004

The projected energy and emissions reductions are the projections under the CAP Update, based on current status, future impact of State policies and programs, and CAP Update assumptions.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

The decarbonization potential of each existing home and existing non-residential development varies depending on building size, age, type of appliances used. To meet the goal, existing homes and non-residential development would need to be retrofitted and decarbonized with 100 percent renewable electricity by 2045 (no additional GHG emissions added due to the additional electricity use).

Currently, a preliminary building stock analysis for the entire SDCP territory, which includes Encinitas, is available. The analysis looks at parcel-level building inventory in the City, including 15 building types grouped based on common use types and sizes (e.g., residential: single-family homes, commercial: offices), number of buildings, and square footages. However, a more in-depth analysis that matches building energy use, types, and square footages is needed in order to estimate the GHG emissions reduction potential of a building decarbonization policy.

7.5.1.6 Measure MBD-1: Implement Energy Efficiency and Decarbonization Projects at Existing Municipal Facilities

The City will work to reduce energy consumption (electricity and natural gas) from municipal facilities and double the goals set in the 2020 CAP to achieve 30 percent energy reduction below 2012 baseline by 2030 (or equivalent to 579,000 kWh electricity savings and 12,000 therms natural gas savings).[39] This goal will be achieved through the implementation of energy efficiency and conservation measures. For 2030 and onward, the City will identify opportunities to reduce or substitute all natural gas use municipal facilities through energy efficiency and conservation, and all-electric appliance installation by 2045. The additional electricity use will be provided by SDCP's 100 percent renewable, Power 100, product or from on-site renewable electricity generation.

Table 29 summarizes the key assumptions and results, calculated using equations similar to Equation 10 and Equation 11.

[39] The current CAP's goals are to reduce municipal energy consumption below 2012 baseline energy use by 7.5% by 2020 and 15% by 2030. Encinitas: Climate Dashboard.

Table 29 Key Assumptions and Results from Measure MBD-1: Implement Energy Efficiency and Decarbonization Projects at Existing Municipal Facilities

Year	Projected Electricity Savings with Energy Retrofit* (kWh/year)	Projected Additional Electricity Use with Fuel Substitution (kWh/year)	Electricity Emission Factor (lbs CO_2e/MWh)	Projected Natural Gas Savings with Energy Retrofits and Fuel Substitution* (therms/year)	Natural Gas Emission Factor (MT CO_2e/therm)	Total Emissions Reductions (MT CO2e)
2030	579,363	not started	50	12,471	0.00545	81
2045	579,363	59,468	0	24,695	0.00045	135

*Fuel substitution would start after 2030
The projected energy and emissions reductions are the projections under the CAP Update, based on current status, future impact of State policies and programs, and CAP Update assumptions.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.1.7 Measure MBD-2: Require New Municipal Facilities Be All-Electric

The City will adopt an administrative policy requiring the development of new municipal facilities to be all-electric. The GHG reduction of this measure will be quantified once there are new municipal facilities planned.

7.5.2 Renewable Energy

7.5.2.1 Measure RE-1: Maintain Membership in San Diego Community Power

As discussed in Section 7.4.1, SB 100 and SB 1020 adopted the 60 percent RPS by 2030 for California's retail electricity suppliers, 90 percent renewable and zero-carbon electricity by 2035, and 100 percent renewable and zero-carbon electricity by 2045. Measure RE-1 assumes SDCP will continue to offer Power100, the 100 percent renewable and carbon-zero electricity product, as the primary electricity rate for Encinitas customers and maintain current 93 percent participation rate through outreach and education.

Because SDCP is required to comply with the State's RPS mandates, a portion of the total emissions reductions from SDCP's renewable and zero-carbon electricity is credited to the State's RPS compliance. The remaining emissions reductions beyond RPS compliance are allocated to Measure RE-1. Table 30 summarizes the key assumptions and results, calculated based on Equation 12.[40]

Equation 12 Emissions Impact Calculation for Local Renewable Program

$$\Delta E_{electricity,CAP\ measure,n} = \Delta E_{electricity,Local\ RE,n} - \Delta E_{electricity,RPS,n}$$

Where

$\Delta E_{electricity,CAP\ measure,n}$ = emissions impact in electricity category through local renewable program in a given year, attributed to a local CAP measure, in MT CO_2e

$\Delta E_{electricity,Local\ RE,n}$ = emissions impact of local renewable program in a given year, in MT CO_2e

$\Delta E_{electricity,RPS,n}$ = emissions impact of local renewable program in a given year, in compliance with RPS, in MT CO_2e

[40] All eligible customers in Encinitas currently have SDCP Power100 product as the default option with a 93% participation rate. SDCP: December 12, 2024 Board of Directors Meeting Agenda Packet.

With,

n = a CAP horizon year, from CAP projection starting year to CAP horizon end year

Table 30 Key Assumptions and Results from Measure RE-1: Maintain Membership in San Diego Community Power

Year	State or CAP Measure	Total for SDCP*	SDCP - Complying with RPS	SDCP - Above RPS
2030	Projected Renewables and Zero Carbon (%)	100%	60%	40%
	GHG Emissions Reductions (MT CO_2e)	45,667	27,400	18,267
2045**	Projected Renewables and Zero Carbon (%)	100%	100%	0%
	GHG Emissions Reductions (MT CO_2e)	60,188	60,188	0

SDCP: San Diego Community Power
*Calculated in Table 12.
**All electric service providers must supply 100 percent renewable or carbon-free electricity on and after 2045.
The projected emissions reductions are the projections under the CAP Update, based on current status, future impact of State policies and programs, and CAP Update assumptions.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.2.2 Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems

The City adopted Ordinance No. 2022-13, on October 26, 2022, requiring solar PV equipment on all existing nonresidential, high-rise multifamily residential, and hotel/motel buildings additions that increase total roof area by at least 1,000 sq. ft. or alterations with a permit value of at least $1,000,000 that affect at least 75 percent of gross floor area. Buildings with greater than or equal to 10,000 sq. ft. of gross floor area are required install a minimum PV system sized at 15 kW per 10,000 sq. ft. of gross floor area. Buildings under 10,000 sq. ft. of gross floor area must install a minimum 5 kW PV system.[41]

Based ordinance implementation data in the recent years, an annual average of approximately 48,000 sq. ft. of new nonresidential developments would be subject to this reach code.[42] The additional PV capacity added due to this ordinance is provided in Table 31, calculated using Equation 5 and Equation 6.

[41] Encinitas: Nonresidential/High-Reise Residential Solar Photovoltaic Regulations and Nonresidential, Hotel & Motel Green Building Checklist (September 2024).
[42] 2017-2022 building permit data were provided by the city to EPIC (May 2024).

Table 31 Additional PV Capacity from Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems

Year	Annual Developments Subject to the Ordinance (sq. ft.)*	Total Developments Due to the Ordinance (sq. ft.)	PV Size Requirement (W per sq. ft.)	Total PV Capacity Due to the Ordinance (MW)
2030	48,000	432,000	1.5	0.6
2045	48,000	1,152,000	1.5	1.7

The projected emissions reductions are the projections under the CAP Update, based on current status, future impact of State policies and programs, and CAP Update assumptions.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

The emissions reductions from all State and CAP measures that increase behind-the-meter renewable supply are allocated based on estimated capacity (MW) as shown in Table 15. The emissions reductions from Measure RE-2 are shown in Table 32.

Table 32 Key Assumptions and Results from Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems

Year	State or City Action	Total	CAP Measure RE-2	CAP Measure MRE-1	California Solar Polices, Programs, and Mandates*
2030	Projected Behind-the-meter PV Capacity (MW)	71	0.6	Not started	71
	Projected Emissions Reduction (MT CO_2e)	26,345	**239**	0	26,106
2045	Projected Behind-the-meter PV Capacity (MW)	95	1.7	0.8	92
	Projected Emissions Reduction (MT CO_2e)	36,751	**671**	330	35,750

*Solar policies, programs, and mandates include the impact of the PV mandates from the 2019 and 2022 Building Energy Efficiency Standard.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
CAP Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems
CAP Measure MRE-1: Install Microgrids with On-site Solar and Battery Storage at Existing Municipal Facilities
The projected capacity and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.2.3 Measure MRE-1: Install Microgrids with On-site Renewable and Battery Storage at Existing Municipal Facilities

The City will complete a feasibility study and install on-site renewable microgrids at suitable municipal facilities to cover municipal energy use. Under Measure MBD-1, the City will identify opportunities to reduce or substitute all natural gas use municipal facilities through energy efficiency, conservation, and

all-electric appliance installation by 2045. The projected electricity use in 2045, including additional all-electric appliance installation, is 1,400,000 kWh, equivalent to 848 kW on-site PV capacity needed.[43]

The emissions reductions from all State and CAP measures that increase behind-the-meter renewable supply are allocated based on estimated capacity (MW) as shown in Table 15. The emissions reductions from Measure MRE-1 are shown in Table 33.

Table 33 Key Assumptions and Results from Measure MRE-1: Install Microgrids with On-site Renewable and Battery Storage at Existing Municipal Facilities

Year	State or City Action	Total	CAP Measure RE-2	CAP Measure MRE-1	California Solar Polices, Programs, and Mandates*
2030	Projected Behind-the-meter PV Capacity (MW)	71	0.6	not started	71
	Projected Emissions Reduction (MT CO_2e)	26,345	239	**0**	26,106
2045	Projected Behind-the-meter PV Capacity (MW)	95	1.7	0.8	92
	Projected Emissions Reduction (MT CO_2e)	36,751	671	**330**	35,750

*Solar policies, programs, and mandates include the impact of the PV mandates from the 2019 and 2022 Building Energy Efficiency Standard.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.
CAP Measure RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems
CAP Measure MRE-1: Install Microgrids with On-site Solar and Battery Storage at Existing Municipal Facilities
The projected capacity and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.2.4 Measure MRE-2: Require New Municipal Facilities to Install Microgrids with On-site Solar and Battery Storage

The City will adopt an administrative policy requiring the development of new municipal facilities to install microgrids. The GHG reduction of this measure will be quantified once there are new municipal facilities planned.

7.5.3 Water Efficiency

7.5.3.1 Measure WE-1: Support Local Water Districts' Water Conservation Efforts

The City will support San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD)'s water conservation effort.[44] The emissions reductions are calculated based on the water savings, the difference between the BAU water system electricity use, and the renewable content of

[43] The capacity factor, 19%, is based on a 2020 City of Encinitas PV and Battery Storage PPA study.
[44] San Dieguito Water District: 2022 Water System Master Plan (October 2021). Table 3-6. For Olivenhain Municipal Water District (OMWD), only of a portion of OMWD's service territory is in Encinitas, projected water conservation in Encinitas is based on the current Encinitas to OMWD entire service territory demand, and OMWD entire service territory conservation. 2020 Urban Water Management Plan (June 2021) Table 4-3.

electricity under RPS compliance and under SDCP's renewable content. Table 34 summarizes the key assumptions and results.[45]

Table 34 Key Assumptions and Results from Measure WE-1: Support Local Water Districts' Water Conservation Efforts

Year	BAU Water Demand (acre-feet)	Reduction in Water Use from Water Districts' Conservation Efforts* (acre-feet)	Water Supply after Reduction (acre-feet)	Upstream GHG Emissions Reduction from Water Savings** (MT CO_2e)	Local GHG Emissions Reduction from Water Savings and Additional Renewable Supply*** (MT CO_2e)	Emissions Reductions (MT CO_2e)
2030	10,773	2,022	8,751	790	165	955
2045	11,150	2,250	8,900	879	0	879

*Both San Dieguito Water District (SDWD) and Olivenhain Municipal Water District (OMWD)
**Upstream emissions reductions from water savings are calculated based on the BAU GHG intensity of SDCWA untreated water supply (0.39 MT CO2e/acre-foot) and the reduction in water use. The impact of increased renewable or zero-carbon electricity in the upstream supply due to RPS is captured under Section 7.4.1
*** Local emissions reductions include (1) the reduction in water distribution electricity use associated with water savings and (2) the reduction in both potable and recycled water distribution emissions due to higher renewable and zero-carbon electricity content
The emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.3.2 Measure WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems

The City requires all new constructed single-family homes to be pre-plumbed for a graywater system.[46] A graywater system reduces potable irrigation water use by using water from showers, bathtubs, lavatory sinks, and laundry for outdoor water use. For a typical household, the water savings per year with a greywater system is approximately 36,500 gallons.[47]

The water savings are converted to GHG reductions based on the imported water GHG intensities in 2030 and 2045. Table 35 summarizes the key assumptions and results.

Table 35 Key Assumptions and Results from Measure WE-2: Require New Single-Family Homes to be Pre-Plumbed for Greywater Systems

Year	Number of Greywater Systems	Water Saving per Home with Greywater System (Gallon per year)	Total Water Use Reduction (Gallons)	Total Water Use Reduction (Acre-feet)	Water-GHG Intensity (MT CO_2e /Acre-foot)*	Emissions Reductions (MT CO_2e)
2030	184	36,465	6,692,439	21	0.4	8
2045	459	36,409	16,705,202	51	0.4	20

[45] Wastewater system energy intensity 156 kWh/acre-foot (478 kWh/million gallon) is based on CMWD: 2020 Urban Water Management Plan (June 2021). Appendix H.
[46] Encinitas: Single-family Green Building Checklist (September, 2024).
[47] The calculation method and factors are based on CAPCOA GHG Handbook W-2 Use Grey Water. For a typical home, on average 25 gallons per occupant from showers, bathtubs, and lavatories; and 15 gallons per day per occupant for laundry. The persons per household in Encinitas is 2.5 persons per household.

* Water-GHG intensity of imported water.
The water and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.3.3 Measure MWE-1: Convert City-Owned Landscape to Drought Tolerant or Native Species

The City plans to identify locations within parks and the public right-of-way to convert landscaping to drought tolerant or native species. On average from fiscal year 2020 to 2022, City-owned landscape water use at parkways and rights-of-ways was 6,300 acre-feet.[48] Switching to low water use plants identified in the City's existing Water Efficient Landscape Ordinance reduces landscape irrigation water use by 27 percent.[49] The goal is to convert 5% of the public landscaping to drought tolerant or native species by 2030 and 15% by 2045.

Similar to Measure WE-2, the water savings are converted to GHG reductions based on the imported water GHG intensities in 2030 and 2045. Key assumptions and results are in Table 36.

Table 36 Key Assumptions and Results from Measure MWE-1: Convert City-Owned Landscape to Drought Tolerant or Native Species

Year	Outdoor Water Use Reduction due to WELO (%)	Outdoor Water Use Reduction due to WELO (Acre-feet)	Water-GHG Intensity (MT CO_2e/Acre-foot)*	Emissions Reductions (MT CO_2e)
2030	27%	87	0.4	34
2045	27%	260	0.4	101

WELO: Water Efficient Landscape Ordinance
*Water-GHG intensity of imported water.
The water and emissions reductions are based on CAP Update assumptions, current status, and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.4 Clean and Efficient Transportation

7.5.4.1 Measure CET-1: Implement the Active Transportation Plan

The City adopted its Active Transportation Plan (ATP) in 2018 and Model Alternatives Project (MAP Encinitas), an implementation plan for the ATP, in 2023. MAP Encinitas identifies a list of prioritized bicycle and pedestrian projects that supports the strategic implementation of mobility projects based on availability of City funds or grant funding opportunities. The City will continue to implement the ATP based on the prioritization and aim to complete all projects by the CAP horizon.

The method to estimate avoided miles is discussed in *Attachment 1: Avoided Vehicle Miles Traveled from Active Transportation Plan (ATP) Projects*. VMT avoided per year was converted to GHG emissions

[48] Parks water use (for both OMWD and SDWD) was provided by city to EPIC (November 2024).
[49] The calculation method and factors are based on CAPCOA GHG Handbook W-5 Design Water-Efficient Landscape. The evapotranspiration adjustment factor (0.45 for non-residential area), plant factor (0.1 for very low water use plants), irrigation efficiency (0.81 for drip system) are based on the city's Water Efficient Landscape Ordinance.

reductions using the average vehicle emission rates. Table 37 summarizes the key assumptions and results.

Table 37 Key Assumptions and Results from Measure CET-1: Implement the Active Transportation Plan

Year	Miles Avoided due to ATP (Miles per year)	Average Vehicle Emission Rate (g CO_2e/mile)	Emissions Reductions (MT CO_2e)
2030	2,829,110	303	858
2045	9,901,885	122	1,204

The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.4.2 Measure CET-2: Implement a Flexible Fleet Program

The City will conduct a study to determine the ideal flexible fleet options that work for the City. The potential flexible fleet options include, rideshare, micro-transit, neighborhood electric vehicle (NEV) shuttles, circulator routes, and ride-hailing.[50]

The City has an existing Encinitas Transit Feasibility Study, completed in 2014, which identifies potential intra-city routes: express services to Mira Costa College (MCC) and to La Costa Canyon High School (LCC HS), one Encinitas Circulator, and one with COASTER connection.[51] Only the Encinitas Circulator and the COASTER connection routes are included here as potential flexible fleet routes because the other two routes require full-size buses, not flexible fleets.

The Encinitas Circulator would serve key destinations in the City, including Encinitas Library, apartments, shopping centers, and office complexes, with 12 loop trips during the day. The miles avoided is based on the estimated passenger ridership of the Encinitas Circulator (27,630 passengers a year) and the average round trip distance per passenger if they were to drive to the destinations (4 miles/round trip). The Transit Feasibility Study recommends a small bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 31,682 miles per year.

The COASTER connection would provide transit commuters traveling to and from San Diego via southbound COASTER service, with three morning trips and three afternoon trips on weekdays. The miles avoided is estimated based on passenger ridership of the COASTER Connection (9,292 passengers a year) and the average round trip distance per passenger if they were to drive to their jobs in San Diego or Sorrento Valley (40 miles/round trip). The Transit Feasibility Study recommends a small bus for the service. Based on the proposed operation schedule, the estimated miles driven by the bus is 12,240 miles per year.

[50] SANDAG: Flexible Fleets.
[51] The Transit Feasibility Study (June 2014) was provided by the City planning and building department to EPIC in the previous CAP development.

Compressed Natural Gas (CNG) buses are recommended in the Transit Feasibility Study, however, it is assumed the small buses/circulators would be electric, based on current market trends and available technology.[52]

VMT avoided per year from avoided passenger vehicle trips was converted to GHG emissions reductions using the average vehicle emission rates. Running the electric circulators also adds GHG emissions to the City, only the net emissions reductions are accounted under Measure CET-2. Table 38 summarizes the key assumptions and results.[53]

Table 38 Key Assumptions and Results from Measure CET-2: Implement a Flexible Fleet Program

Year	VMT Avoided due to Flexible Fleets (Miles per year)	Average Vehicle Emission Rate (g CO_2e/mile)	Emissions Reductions due to VMT Avoided (MT CO_2e)	GHG Emissions Added due to New Local Electric Circulators (MT CO_2e)	Net GHG Emissions Reductions (MT CO_2e)
2030	510,489	303	155	5	150
2045	510,489	122	62	0	62
The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2024					

7.5.4.3 Measure CET-3: Require Transportation Demand Management Programs for New Residential, Nonresidential, and Major Redevelopment Projects

The City will require new developments to create and implement transportation demand management strategies to mitigate traffic impacts of the projects in accordance with the City's Mobility Element and VMT guidelines. The goal of this measure is to have an additional 7,000 commuters traveling in or out of the City using an alternative mode for their commutes by 2045. This would be equivalent to approximately 30 percent of the employees in Encinitas commuting alternatively.

The GHG emissions reductions are based on the number of commuters using alternative modes, estimated average driving distance avoided, and the average vehicle emission rate. Table 39 summarizes the key assumptions and results.[54]

[52] All NEV shuttles and circulators currently operating in the San Diego region are electric. SANDAG: Flexible Fleets.
[53] The vehicle efficiency for an electric circulator is 2.84 kWh per mile. National Renewable Energy Lab: Zero-Emission Bus Evaluation Results: County Connection Battery Electric Buses (2018). Table ES-1.
[54] The round-trip employee commute (driving) distance for Encinitas employees is 31.1 miles based on the SANDAG Mode Choice Report.

Table 39 Key Assumptions and Results from Measure CET-3: Require Transportation Demand Management Programs for New Residential, Nonresidential, and Major Redevelopment Projects

Year	Encinitas Commuter Miles Avoided* (miles/person/year)	New Encinitas Commuters Using Alternative Modes to Work	Total VMT Avoided (miles/year)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions Reductions (MT CO_2e)
2030	3,777	1,358	5,127,735	303	1,556
2045	3,777	7,469	28,209,570	122	3,430

*31.1 miles round-trip per workday and 255 workdays per year.
The emissions reductions are the projection under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.4.4 Measure CET-4: Reduce Vehicle Miles Traveled

The City will develop and implement a comprehensive set of studies, programs, and regulations to work towards a citywide VMT reduction. For example, a policy requiring projects with a significant and unavoidable VMT impact to mitigate VMT by constructing a priority mobility project or implementing a VMT Exchange Program for all applicable development projects. The goal of this measure is to reduce citywide VMT per capita to 20 percent below 2016 level by 2045, or 3.8 miles per capita per day.

The GHG emissions reductions are based on the number of commuters using alternative modes, estimated average driving distance avoided, and the average vehicle emission rate. Table 40 summarizes the key assumptions and results.[55]

Table 40 Key Assumptions and Results from Measure CET-4: Reduce Vehicle Miles Traveled

Year	Per Capita VMT Reduction Below 2016 Level (%)	Per Capita VMT Reduction Below 2016 Level** (miles per Capita per Day)	Total VMT Avoided (Million miles/year)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions Reductions (MT CO_2e)
2030	Not started	Not started	Not started	303	0*
2045	20%	3.8	107	122	13,014

*Measure to start after 2030
**VMT per capita in 2016 was estimated at 18.9 mile per capita per weekday (including all population and all trips, not just workforce and workday trips)
The emissions reductions are the projection under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

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[55] 2016 VMT per capita was estimated based on 2016 total citywide VMT (1,441,692 miles per weekday) and 2016 population (76,408).

7.5.4.5 Measure CET-5: Improve Traffic Flow

The City will improve traffic flow by (1) synchronizing traffic signals at 60 intersections by 2030 to obtain more efficient fuel use through smoother traffic flow; and (2) installing nine new roundabouts or traffic circles by 2030 and additional eight (17 total) by 2045.[56]

The effect of traffic signal synchronization and roundabouts on fuel reduction depends on the traffic volume and size of the intersections on the arterials. Based on the study of a traffic signal synchronization project of a similar size, the annual fuel savings per intersection is around 2,400 gallons.[57] The City's Intersection Control Evaluation engineering standards requires intersections to be analyzed for roundabouts or traffic signals and installed wherever feasible. Based on a study of roundabouts with similar sizes, the annual fuel savings per roundabout is around 19,000 gallons.[58]

As vehicles get more efficient and the number of ZEVs increases, the fuel savings per roundabout and per intersection will decrease. Table 41 and Table 42 summarize the key assumptions and results, calculated based on Equation 13.

Equation 13 Emissions Impact from Retiming Traffic Signals or Installing Roundabouts

$$\Delta E_{transp,CAP\ measure,n} = N_n * \Delta V_{fuel} * EF_{transp,n} * MPG_n * 10^{-6}$$

Where

$\Delta E_{transp,CAP\ measure,n}$	= emissions impact in the transportation category from a CAP measure that improves traffic flow (e.g., retime traffic signals or install roundabouts) in a given year, in MT CO_2e
N_n	= additional traffic signals retimed or roundabouts installed since baseline year up to year n
$\Delta V_{fuel,n}$	= equivalent fuel reduction per intersection with signals retimed or roundabouts installed in a given year, gallons per intersection per year
$EF_{transp,n}$	= average vehicle emission factor in the San Diego region in a given year, grams CO_2e per mile
MPG_n	= fuel economy of an average vehicle in the San Diego region, in a given year, miles per gallon
10^{-6}	= conversion factor, MT CO_2e in a gram

With,

n	= a CAP horizon year, from CAP projection starting year to CAP horizon end year

[56] The list of planned, designed, or funded roundabouts, either standard alone or as part of the Leucadia Streetscape project, were provided by city to EPIC (October 2024). Encinitas: Streetscape Segment C West Side.

[57] Sunkari: The Benefits of Retiming Traffic Signals (2004). The Jacksonville traffic signal retiming project at a 25-intersection section resulted in estimated annual fuel savings of 65,000 gallons.

[58] Varhelyi: The Effects of Small Roundabouts on Emission and Fuel Consumption: A Case Study (2002). The study estimated the traffic volume of the intersection and the fuel consumption before and after the roundabout. The traffic volume is 23,500 vehicles per day and the fuel savings are approximately 144 kg per day after the roundabout installation.

Table 41 Key Assumptions and Results from Measure CET-5: Improve Traffic Flow (Signal Synchronization)

Year	Number of Intersections with Traffic Signal Synchronization	Increase in Vehicle Fuel Efficiency Compared to Baseline Year*	Equivalent Fuel Saving per Intersection* (Gallons/ year)	Fuel Saving from All Intersections (gallons/year)	GHG Emissions for Fuel** (lbs CO_2e/gallon)	GHG Emissions Reductions (MT CO_2e)
2030	60	32%	1,642	98,498	19.1	853
2045	60	73%	658	39,471	19.1	342

*Increase in vehicle fuel efficiency is based on the decrease of the average vehicle emission rate.
**Emissions per gallon of fuel use for an average vehicle in the San Diego region, regardless of fuel type, vehicle type, or fuel economy. The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

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Table 42 Key Assumptions and Results from Measure CET-5: Improve Traffic Flow

Year	Number of New Roundabouts	Increase in Vehicle Fuel Efficiency Compared to Baseline Year*	Equivalent Fuel Savings per Intersection* (gallons/year)	Fuel Savings for All Intersections (gallons/year)	GHG Emissions for Fuel** (lbs CO_2e/gallon)	GHG Emissions Reductions (MT CO_2e)
2030	9	32%	13,452	121,065	19.1	1,049
2045	17	73%	5,390	91,638	19.1	794

*Increase in vehicle fuel efficiency is based on the decrease of the average vehicle emission rate.
**Emissions per gallon of fuel use for an average vehicle in the San Diego region, regardless of fuel type, vehicle type, or fuel economy. The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

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By adding the totals from **Error! Reference source not found.** and **Error! Reference source not found.**, to the total GHG emissions reductions from Measure CET-5 are 1,902 MT CO_2e in 2030 and 1,136 MT CO_2e in 2045.

7.5.4.6 Measure CET-6: Require Residential Electric Vehicle Charging Stations

The City adopted Ordinance No. 2022-14, on October 26, 2022, and Ordinance No. 2024-04, on June 12, 2024, requiring electric vehicle equipment at all new residential, hotel or motel, and nonresidential projects as well as hotel or motel and nonresidential additions and alterations greater than 10,000 sq. ft.[59] The City will continue to implement these ordinances and readopt the similar local building codes ("reach codes") via ordinance for each three-year State Building Code.

Because this infrastructure will support the State's ZEV mandates and ACCII (described in Section 7.4.3), the GHG emissions reductions from this measure are not quantified separately.

[59] Encinitas: Electric Vehicle Charging Regulations (September, 2024).

7.5.4.7 Measure CET-7: Require Nonresidential Electric Vehicle Charging Stations

As stated in section 7.5.4.4 above, Ordinance Nos. 2022-14 and 2024-04 were adopted by the City in 2022 and 2024, respectively, and require electrical vehicle equipment to be installed on all new residential, hotel or motel, and nonresidential projects as well as hotel or motel and nonresidential additions and alterations greater than 10,000 sq. ft.

Similar to the discussion under the measure CET-4 above, because this infrastructure will support the State's ZEV mandates and ACCII (described in Section 7.4.3), the GHG emissions reductions this measure are not quantified separately.

7.5.4.8 Measure MCET-1: Transition to Zero-Emission Vehicle Municipal Fleet

The City plans to convert gasoline vehicles (light-duty cars and trucks) within its fleet to ZEVs and purchase renewable diesel for all diesel-fueled heavy-duty trucks. Assuming the municipal fleet size does not increase from the most recent years (2021-2023), Table 43 and Table 44 show the key assumptions and results.[60]

Table 43 Key Assumptions and Results from Measure MCET-1: Transition to Zero-Emission Vehicle Municipal Fleet

Year	% Reduction in Gasoline	Gasoline Fuel Use* (Gallons)	Gasoline Reduction (Gallons)	Emissions Reduction from Gasoline Reduction** (MT CO_2e)	Gasoline Fleet Miles (miles/year)	Additional Electric Load (kWh)	Emissions Added due to Electric Load*** (MT CO_2e)	Net GHG Emissions Reductions (MT CO_2e)
2030	50%	17,041	8,521	68	242,889	36,433	0	68
2045	100%	14,721	14,721	117	262,946	78,884	0	117

*Assuming the fleet size is the same, as vehicles get more efficient and more ZEVs are on the market due to California's ZEV mandates, the gasoline demand decreases
**Calculated based the gasoline reduction and the gasoline carbon intensity of 7,978 CO_2e/gallon
***Emissions added due to additional electric load were zero because the electricity will be 100 percent renewable or zero-carbon from San Diego Community Power or on-site renewable
The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

Table 44 Key Assumptions and Results from Measure MCET-1: Transition to Zero-Emission Vehicle Municipal Fleet

Year	% Reduction in Diesel	Diesel Fuel Use* (gallons)	Diesel Reduction (gallons)	GHG Emissions Reductions** (MT CO_2e)
2030	100%	24,081	24,081	197
2045	100%	20,802	20,802	170

*Assuming the fleet size is the same, as vehicles get more efficient and more zero emission vehicles are on the market due to California's mandates, the diesel demand decreases

[60] Fuel carbon contents are based on CARB statewide GHG inventor 2022 Edition, last updated on October 26, 2022. 2021–2023 fleet fuel use and vehicle mileage are provided by city to EPIC (May 2024).

**Calculated based on diesel reduction and the difference between diesel blend carbon intensity (8,661 CO_2e/gallon) and renewable diesel carbon intensity (478 CO_2e/gallon) The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2023

The total GHG emissions reductions from Measure MCET-1 are 265 MT CO_2e in 2030 and 288 MT CO_2e in 2045.

7.5.4.9 Measure MCET-2: Implement a Municipal Employee Transportation Demand Management (TDM) Program

Eligible City employees have the option to telework a maximum of two days a week to avoid commuting to and from the office, with manager approval. In addition, currently 22 City employees commute to work alternatively at 50% of the time. The goal is to increase the number of employees who commute alternatively by 20% to 26 employees by 2045. The City will continue implementing these programs and consider other TDM options for City employees.

The avoided VMT is estimated based on the driving distance avoided per workday of all eligible City staff and the average telecommute/alternative commute days per week. Miles avoided were converted to GHG emissions reductions using the average vehicle emission rates. Table 45 shows the key assumptions and results.[61]

Table 45 Key Assumptions and Results from Measure MCET-2: Implement a Municipal Employee Transportation Demand Management (TDM) Program

Year	Miles Avoided from City Staff Telecommute or Commute Alternatively* (miles/year)	Average Vehicle Emission Rate (g CO_2e/mile)	GHG Emissions Reductions (MT CO_2e)
2030	204,867	303	62
2045	210,893	122	26
*Assumes 1,684 miles commute distance avoided per workday from all 114 telecommute eligible employees, 2 telecommute days a week, and 51 work weeks per year The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2024			

7.5.4.10 Measure CET-6: Install Public Electric Vehicle Charging Stations

The City will implement the adopted Electric Vehicle Charging Station Master Plan (March 2023) and install publicly available electric vehicle charging stations in municipally owned parking lots and encourage nonresidential property owners to install EV charging stations.[62]

[61] One-way commute distance avoided per workday, 5,000 miles, was provided by city staff to EPIC based on city internal data analysis, August 17, 2023.
[62] Encinitas: Electric Vehicle Charging Master Plan (March 2023).

Similar to the discussion under the measure CET-4 and CET-5 above, because this infrastructure will support the State's ZEV mandates and ACCII (described in Section 7.4.3), the GHG emissions reductions this measure are not quantified separately.

7.5.5 Zero Emission Equipment

7.5.5.1 Measure ZE-1: Limit Use of Gas-Powered Leaf Blowers

In 2019, the City adopted Ordinance No. 2019-06 prohibiting the use of gas-powered leaf blowers within the City, as of January 2020.[63] While the ordinance has been effective for five years, some residents and landscape companies remain non-compliant. The City will continue to provide education and enforce the ordinance and aim to eliminate all emissions from gas-powered leaf blowers by 2030. The method to project emissions from gas-powered leaf blowers is discussed in Section 3 and is based on CARB's OFFROAD2021 model. Table 46 summarizes the key assumptions and results.

Table 46 Key Assumptions and Results from Measure ZE-1: Limit Use of Gas-Powered Leaf Blowers

Year	Projected GHG Emissions from Gas-Powered Leaf Blowers (MT CO_2e)	Percent Reduction in GHG Emissions	GHG Emissions Reductions (MT CO_2e)
2030	250	100%	250
2045	247	100%	247
The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. CARB 2021, Energy Policy Initiatives Center, University of San Diego 2024			

7.5.5.2 Measure ZE-2: Limit Use of Gas-Powered Landscape Equipment

In addition to the leaf blower ordinance discussed above, the City will adopt an ordinance restricting the use of gas-powered landscape equipment by 2030 and aim to eliminate all emissions from landscape equipment by 2045. The method to project emissions from landscape equipment is discussed in Section 3 and is based on CARB's OFFROAD2021 model. Table 47 summarizes the key assumptions and results.

[63] Encinitas: Leaf Blowers.

Table 47 Key Assumptions and Results from Measure ZE-2: Limit Use of Gas-Powered Landscape Equipment

Year	Projected GHG Emissions from All Gas-Powered Landscape Equipment* (MT CO_2e)	Percent Reduction in GHG Emissions	GHG Emissions Reductions (MT CO_2e)
2030	1,234	Not started	Not started
2045	1,290	100%	1,043*

*Landscape equipment other than leaf blowers, the impact of eliminating emissions from gas-powered leaf blowers is estimated under Measure OR-1: Limit Use of Gas-Powered Leaf Blowers
**Measure to start after 2030
The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

CARB 2021, Energy Policy Initiatives Center, University of San Diego 2024

7.5.6 Zero Waste

7.5.6.1 Measure ZW-1: Implement a Zero Waste Program

The goal of Measure ZW-1 is to implement the Zero Waste Program and reduce the pounds per person per day (PPD) of waste disposed in landfills to 3 PPD by 2030 and 1.5 PPD by 2045. The 2035 and 2045 PPDs are equivalent to an 80 percent waste diversion rate by 2030 and a 90 percent waste diversion rate by 2045.

The City has not conducted a waste characterization study, therefore, the 2016 waste composition data (used in the 2016 GHG inventory) are used and held constant through 2045.[64] The emissions avoided from increasing the waste diversion rate is the difference between the waste category BAU emissions and the solid waste emissions using the target diversion rates and corresponding PPDs. Table 48 summarizes the key assumptions and results, calculated based on Equation 14 and Equation 15.

Equation 14 Solid Waste Reduction Calculation

$$\Delta SW_n = SW_{BAU,n} - (2 * PPD_{50\%}) * \left(1 - DR_{target,n}\right) * P_n * 2{,}000 * 365$$

Where,

ΔSW_n = mixed solid waste diverted (avoided) from landfill in a given year, in short tons

$SW_{BAU,n}$ = BAU mixed solid waste disposal by a city projected for a given year, in short tons

$PPD_{50\%}$ = PPD equivalent to 50% diversion rate

$DR_{target,n}$ = waste diversion rate targeted for a given year in the CAP measure, in %

P_n = projected population in a given year

2 = conversion factor, converting waste disposal (with 50% diversion rate) to waste generation

2,000 = conversion factor, lbs in a ton

365 = conversion factor, days in a year

[64] Recent State actions include organic waste recycling, which may reduce the mixed waste emission factor in future years.

With,

n = a CAP horizon year, from baseline year to CAP horizon end year

Equation 15 Emissions Impact from Increased Solid Waste Diversion

$$\Delta E_{waste,CAP\ measure,n} = \Delta SW_n * EF_{msw} * (1 - C_n) * (1 - 0.1)$$

Where

$\Delta E_{waste,CAP\ mesure,n}$ = emissions impact in the waste category from a CAP measure in a given year, in MT CO_2e

ΔSW_n = mixed solid waste diverted (avoided) from landfill in a given year, in short ton

EF_{msw} = mixed waste emission factor, in MT CO_2e/short ton

ΔC_n = landfill gas capture rate in a given year, in percent

0.1 = default oxidation rate, U.S. Community Protocol

With,

n = a CAP horizon year, from baseline year to CAP horizon end year

Table 48 Key Assumptions and Results from Measure ZW-1: Implement a Zero Waste Program

Year	Waste Disposed at Landfills from Encinitas			Landfill Gas Capture Rate	GHG Emissions with Targeted Diversion Rate (MT CO_2e)	BAU GHG Emissions (MT CO_2e)	GHG Emissions Reductions (MT CO_2e)
	lbs/person/day	short tons/year	MT/year				
2030	3.0	43,246	39,232	90%	3,815	14,173	10,357
2045	1.5	22,379	20,302	90%	1,974	14,669	12,694

Emissions from waste are calculated based on the mixed waste emission factor of 0.98 MT CO_2e/short ton, an oxidation rate (10%), and the waste capture rates. The emissions reductions are the projections under the CAP Update, based on CAP Update assumptions and future impact of State policies and programs.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.7 Carbon Sequestration

7.5.7.1 Measure CS-1: Establish a Tree Canopy Goal for the City

The City will evaluate its current urban tree canopy and establish a goal for increasing the canopy cover. The most recent urban tree canopy assessment in the San Diego region, based on high-resolution Light Detection and Ranging (LiDAR), shows the City has approximately 22 percent existing urban tree canopy.[65] While awaiting the completion of a tree canopy assessment the City will maintain the current 22 percent canopy cover through 2030. Once the assessment is complete, a tree canopy goal will be established for the City. As a proxy goal, the CAP Update assumes an increase in tree canopy cover of 5 percent, or a total canopy cover of 27 percent by 2045, or another percentage as determined by the study.

The carbon sequestration potential is calculated based on the projected canopy cover and the CO_2 absorption rate per acre.[66] Measure CS-2 through Measure CS-5 also aim to increase the number of

[65] The assessment was done in 2014 for all urban areas in the San Diego County using method developed by University of Vermont and USDA Forest Service.

[66] Brown, et al.: Baseline Greenhouse Gas Emissions and Removals for Forest, Range, and Agricultural Lands in California (2004).

trees planted in the City, the carbon sequestration impacts of these measures are removed from Measure CS-1 to avoid double counting. Table 49 summarizes the key assumptions and results.

Table 49 Key Assumptions and Results from Measure CS-1: Establish a Tree Canopy Goal for the City

Year	Canopy Cover Target (%)	Targeted Canopy Cover (Acres)	CO2 Sequestered Rate (MT CO_2/acre/year)*	Carbon Sequestration (MT CO_2)
2030	22%	2,756	1.56	4,096
2045	27%	3,383	1.56	4,841

*Average of trees per year. An improved estimate of the carbon sequestration rate can be evaluated once the implementation parameters are decided.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Brown et al 2004, Energy Policy Initiatives Center, University of San Diego 2024

7.5.7.2 Measure CS-2: Enforce Landscape Tree Requirements at New Developments

The City's current water efficient landscape regulation includes the following requirements for tree planting: (1) a minimum of one tree for every five parking spaces at new residential and non-residential developments; and (2) a minimum of one tree per unit at new residential developments, including single-family and multi-family developments. A minimum of 15 gallons in size and proper irrigation and maintenance are required.[67]

As discussed under Measure BD-4, based on building permit data in recent years, an annual average of approximately 250,000 sq. ft. of new nonresidential developments and 6,000 sq. ft. of additions to nonresidential developments were added that would be subject to the landscape regulation.[68] The Encinitas Municipal Code off-street parking regulations require on average of one parking space per 250 sq. ft. gross floor area; therefore, approximately 1,024 new parking spaces will be added every year at these new nonresidential developments.[69] The new parking spaces will yield 205 new trees planted annually.

For new residential developments, the number of trees added will be the same as the number of new housing units described in Section 3. The proposed strategy is to encourage thoughtful site design practices to optimize tree planting and open space. The carbon sequestration potential from the new trees is based on the projected total number of trees planted and the average CO_2 absorption rate per mature tree per year.[70] Table 50 summarizes the key assumptions and results, calculated based on Equation 16.

[67] Encinitas Municipal Code: Sec. 30.54.060 Parking Area Landscaping, accessed May 21, 2024.
[68] 2017-2022 building permit data were provided by the city to EPIC (May 2024).
[69] Encinitas Municipal Code: Sec. 30.54.030 Schedule of Required Off-Street Parking, accessed May 21, 2024. The minimum parking requirements for commercial, office, restaurant/food, retail, etc., are different. The average is used here.
[70] On average, the CO_2 sequestration rate is 0.035 MT CO_2 per tree per year. The carbon sequestration rate depends on the tree species, climate zone, planting location, and tree age. A more accurate carbon sequestration rate will be evaluated once the parameters are decided in implementation of the measure. California Emissions Estimator Model (CALEEMOD). Appendix D Default Data Tables (October 2017).

Equation 16 CO_2 Sequestered Calculation from Increased Urban Tree Planting

$$\Delta E_{CAP\ measure,n} = \sum_{tree\ species} (P_{tree\ species,n} * CS_{tree\ species})$$

Where,

$\Delta E_{CAP\ measure,n}$ = CO_2 sequestered from a CAP measure in a given year, in MT CO_2

$P_{tree\ species,n}$ = number of new trees planted from baseline year to a given year for each of tree species

$CS_{tree\ species}$ = carbon sequestration rate of each of tree species, MT CO_2 per year

With,

tree species = type of new trees planted

n = a CAP horizon year, from baseline year to CAP horizon end year

Table 50 Key Assumptions and Results from Measure CS-2: Enforce Landscape Tree Requirements at New Developments

Year	Total Landscape Trees Added at Non-Residential Developments (New and Additions)	Total Landscape Trees Added at New Residential Developments	Total Landscape Trees Added	CO2 Sequestered* (MT CO_2/tree/year)	Carbon Sequestration (MT CO_2)
2030	2,867	432	3,299	0.0354	117
2045	5,939	895	6,834	0.0354	242

*Average of trees per year. An improved estimate of the carbon sequestration rate can be evaluated once the implementation parameters are decided.
Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation.

Energy Policy Initiatives Center, University of San Diego 2024

7.5.7.3 Measure CS-3: Incentivize Tree Planting on Private Property

The City will incentivize residents and businesses to plant 500 trees per year on private property through free tree giveaway program. Similar to Measure CS-2, the carbon sequestration potential from the new trees is based on the projected total number of trees planted and the average CO_2 absorption rate per mature tree per year.[71] Table 51 summarizes the key assumptions and results, calculated based on Equation 16.

Table 51 Key Assumptions and Results from Measure CS-3: Incentivize Tree Planting on Private Property

Year	Cumulative Number of Trees from the Free Tree Program*	CO_2 Sequestered Rate (MT CO_2/tree/year)**	Carbon Sequestration (MT CO_2)
2030	500	1.56	18
2045	2,000	1.56	17
*Program starts in 2026			

[71] On average, the CO_2 sequestration rate is 0.035 MT CO_2 per tree per year. The carbon sequestration rate depends on the tree species, climate zone, planting location, and tree age. A more accurate carbon sequestration rate will be evaluated once the parameters are decided in implementation of the measure. California Emissions Estimator Model (CALEEMOD). Appendix D Default Data Tables (October 2017).

**Average of trees per year. An improved estimate of the carbon sequestration rate can be evaluated once the implementation parameters are decided. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2024

7.5.7.4 Measure CS-4: Adopt and Implement a Mature Tree Ordinance

The City is in the process of adopting a Mature Tree Ordinance with new replacement ratio based on replacement tree locations and species for new developments and redevelopments, including new multi-family developments, new commercial or mixed-use developments, and redevelopment of existing commercial and multi-family properties. Currently, the ratio is 1:1 for all developments.

The new ratios are: (1) 3:1 replacement ratio if replacing on the same property, (2) 4:1 replacement ratio if replacing on a different property, (3) and 2:1 replacement ratio if replacing with native trees on the same property as defined by the ordinance. Because the ordinance is still at the drafting stage with no implementation data available, this measure is not quantified for GHG reductions currently.

7.5.7.5 Measure MCS-1: Plant and Maintain City Trees

The City has been planting and maintaining City trees in accordance with the City's Urban Forest Management Plan and will continue to plant new trees in the City by identifying right of way and park land that have space for additional trees. The goal is to plant and maintain an average of 100 net new trees per year to the City's urban forest.

Similar to Measure CS-2 and CS-3, the carbon sequestration potential from the new trees is based on the projected total number of trees planted and the average CO_2 absorption rate per mature tree pear year.[72] Table 52 summarizes the key assumptions and results, calculated based on Equation 16.[73]

Table 52 Key Assumptions and Results from Measure MCS-1: Plant and Maintain City Trees

Year	Cumulative Number of New City Trees	CO_2 Sequestered Rate (MT CO_2 /tree/year)**	Carbon Sequestration (MT CO_2)
2030	1,875	1.56	66
2045	3,375	1.56	119
**Average of trees per tree. An improved estimate of the carbon sequestration rate can be evaluated once the implementation parameters are decided. Sums may not add up to totals due to rounding. Values are not rounded in the intermediary steps in the calculation. Energy Policy Initiatives Center, University of San Diego 2024			

[72] On average, the CO_2 sequestration rate is 0.035 MT CO_2 per tree per year. The carbon sequestration rate depends on the tree species, climate zone, planting location, and tree age. A more accurate carbon sequestration rate will be evaluated once the parameters are decided in implementation of the measure. California Emissions Estimator Model (CALEEMOD). Appendix D Default Data Tables (October 2017).

[73] 2016 through 2023 historical city tree planting data are from Encinitas CAP Dashboard.

ATTACHMENT 1: AVOIDED VEHICLE MILES TRAVELED FROM ACTIVE TRANSPORTATION PLAN (ATP) PROJECTS

The Active Transportation Plan (ATP) was drafted in November 2018. The plan documents Encinitas' existing bikeway and walkway systems and recommends new projects to improve the systems. The ATP indicates that most future bicycle and walking activities are likely to originate from within residential areas, with the most common trip destinations being schools and parks, followed by commercial, retail and employment centers.

The ATP provides a list of proposed bicycle and pedestrian projects, which together would provide a much-improved network of multimodal connectivity and encourage more residents to use active modes of transportation (walk and bicycle) in lieu of a vehicle. This document details the methods used to update the estimate of the potential vehicle miles traveled (VMT) associated with projects in the ATP and summarizes results of the analysis. These results inform greenhouse gas (GHG) reduction calculations for the City's 2025 climate action plan (CAP) update.[74]

A.1 Comparison with Previous Analysis

The method used to estimate potential VMT avoided for projects in the ATP is consistent with the approach used in the 2020 CAP interim update. Since the unit capacity of the potential sites in the 2021-2029 Housing Element remains unchanged from the 2018 Housing Element Update (HEU), the unit capacity from the HEU also remains the same here. Trip distance and frequency estimates have been updated using data from Google's Environmental Insights Explorer (EIE).[75]

A.2 Methods and Inputs

Estimates for avoided VMT were found using the following equation:

Equation 17 Annual VMT Avoided Calculation

$$Annual\,VMT\,Avoided = X_{walk} * 2\beta_{walk} * \omega_{walk} + X_{bike} * 2\beta_{bike} * \omega_{bike}$$

Where,

X= housing units within the pedestrian/bicycle zones
β= median one-way trip distance in miles to activity center
ω= number of trips per household per year to activity center.

[74] GHG reduction estimates associated with implementation of the ATP are provided under CAP Measure CET-1and are not included here.
[75] Google: Environmental Insights Explorer.

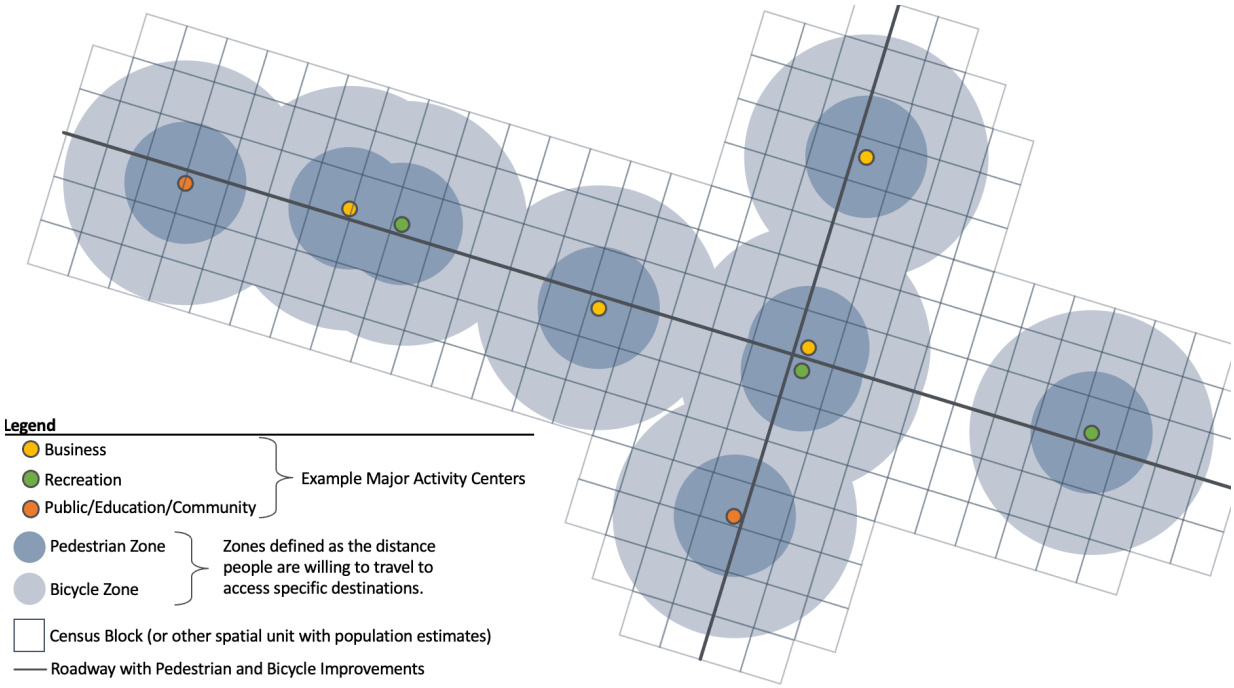

Figure 8 Concept Map Illustrating Pedestrian and Bicycle Zones and Affected Areas

A2.1 Trip Distance and Frequency

Trip distance is measured as the one-way distance in miles individuals are willing to travel using a given mode of transportation to each activity center identified.[76] Trip frequency is measured as the number of trips made by households, using a given mode of transportation, to each activity center annually. Google's EIE were used to estimate the travel distance and frequency by pedestrian and bicycle modes of travel (Table 53). [77] EIE is a tool that provides city-level multi-modal transportation data based on continuous observation, making it more relevant for assessing active transportation in Encinitas.[78] Previously, county-level data from the National Household Travel Survey (NHTS)[79] was used for calculations. For example, in Table 1, pedestrians are willing to walk an average one-way distance of 0.55 miles to *Food & Dining* activity centers, and would do this, on average, 71.51 times per year. Bicycle riders are willing to ride an average distance of 1.53 miles to *Food &* Dining activity centers areas, and 7.77 times per year.

[76] The Encinitas ATP groups 'points of interest' near ATP project areas into one of three major activity centers: (1) business, (2) recreation, and (3) public/education/community. To align with NHTS data, these activity centers were reclassified into six categories: food & dining, other general errands, recreation, religious & community activities, retail goods & services, and school. A seventh category was added—transit—using data available through SanGIS for transit access locations (e.g., bus stops, train stations).

[77] Google Environmental Insights Explorer (Accessed: December 2024).

[78] ICLEI: Technical Review of Google Environmental Insights Explorer Data for Local Greenhouse Gas Inventories (August 2019).

[79] Federal Highway Administration (2019). 2017 National Household Transportation Survey – California Add-on. National Renewable Energy Laboratory. Accessed 14. Feb 2020.

Table 53 Trip Distance and Frequency per Household Estimates

Activity Center	Pedestrian		Bicycle	
	Trip Distance (mi)	Trip Frequency (trips/unit/yr)	Trip Distance (mi)	Trip Frequency (trips/unit/yr)
Food & Dining	0.55	71.51	1.53	7.77
Other General Errands	0.48	20.74	1.99	1.55
Recreation	0.68	39.31	2.56	5.57
Religious & Community Activities	0.62	4.02	1.95	0.31
Retail Goods & Services	0.92	74.91	3.13	3.41
School	0.92	20.12	1.86	1.86
Transit	0.58	17.34	2.12	2.79

A2.2 Housing Units

ArcGIS was used to determine travel distance 'zones' for each activity center category using the median pedestrian and bicycle travel distances provided in Table 1 (see **Error! Reference source not found.** for a visualization of the 'zones').[80] The number of housing units within each zone were then estimated using parcel level data obtained through SanGIS for the City of Encinitas only. Housing units were estimated using two scenarios: (2) under full buildout of the HEU (Table 54). Appendix C of the HEU was used to modify existing parcel data to determine the number of units per parcel under full buildout of the HEU.[81]

Table 54 HEU Buildout Housing Units within Pedestrian and Bicycle Zones

Activity Center	Pedestrian	Bicycle
Food & Dining	13,960	28,213
Other General Errands	5,173	26,321
Recreation	22,312	29,889
Religious & Community Activities	14,770	29,539
Retail Goods & Services	24,016	29,889
School	22,209	29,412
Transit	19,835	29,889

A.3 Avoided Vehicle Miles Traveled (VMT)

Inputs provided in Table 53 and Table 54 were applied using Equation 17 to calculate avoided VMT associated with ATP projects. Results are provided in Table 55 under the full buildout of the HEU. Increased housing density as a result of the HEU in areas with increased access to active transportation options will lead to an increase in VMT avoided.

[80] Zones were defined using travel distances along defined routes (roads, pathways, pedestrian bridges, etc.) and not "as the crow flies."
[81] Encinitas: 2021-2029 Housing Element.

Table 55 Avoided VMT for ATP Projects – Full Buildout of HEU

Activity Center Category	Pedestrian Avoided VMT (mi/yr)	Bicycle Avoided VMT (mi/yr)	Total Avoided VMT (mi/yr)
Food & Dining	1,089,179	670,969	1,760,148
Other General Errands	103,243	161,856	265,099
Recreation	1,186,369	852,881	2,039,251
Religious & Community Activities	73,184	35,744	108,928
Retail Goods & Services	3,312,545	638,057	3,950,602
School	826,174	202,690	1,028,865
Transit	396,007	352,984	748,992
All Categories	6,986,703	2,915,182	9,901,885

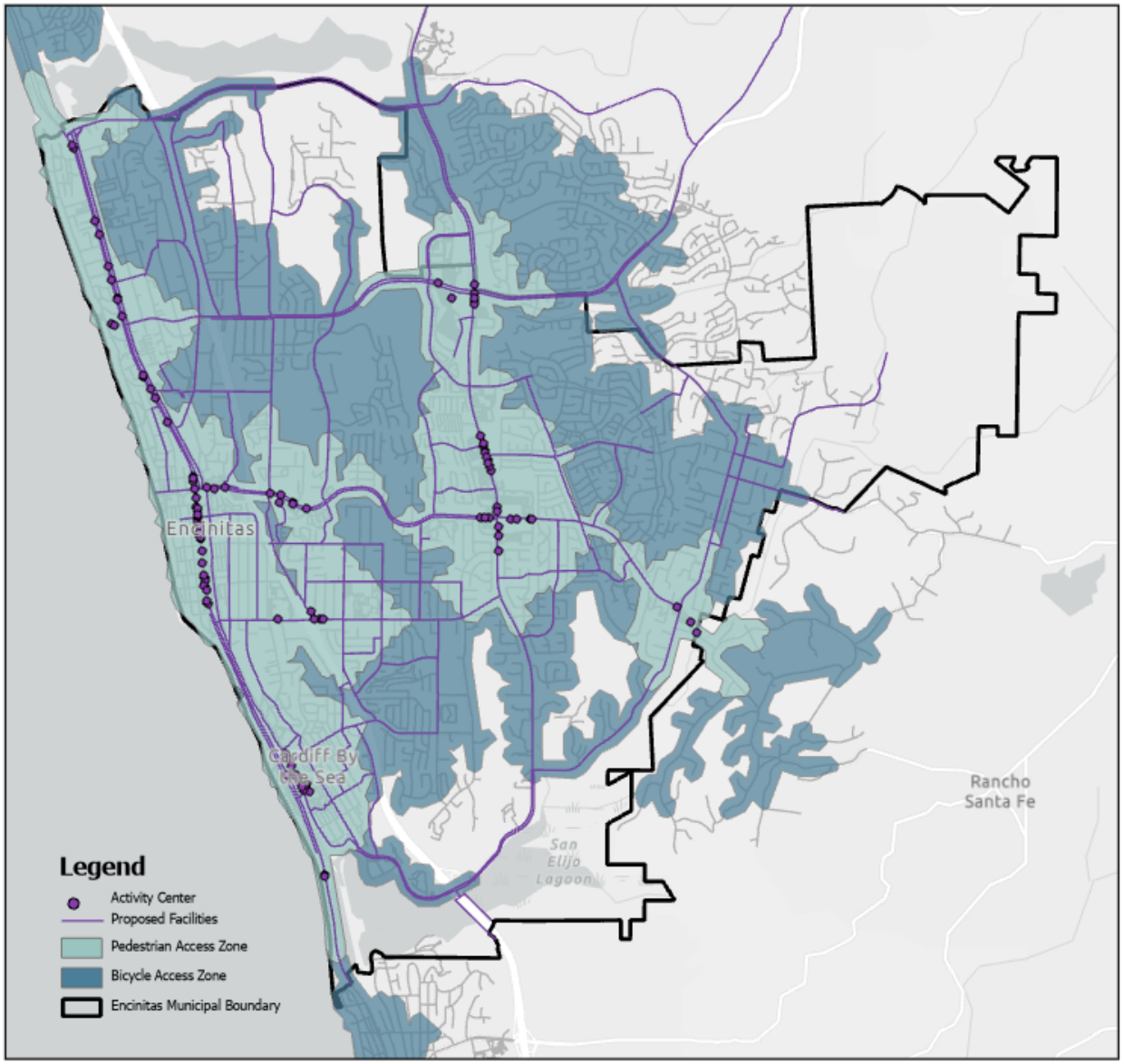

Figure 9 City of Encinitas ATP- Pedestrian and Bicycle Zones for the Food & Dining Activity Center Category (Map for Illustrative Purposes)

Appendix G

Implementation Cost Analysis
(Work in Progress)

Appendix H

2025 CAP Implementation Matrix

Strategy	Measure	Lead Departments	Collaborating Department
		Multiple lead departments may exist associated with different actions within the measures	
Building Decarbonization	BD-1: Require Existing Residential Development Energy Efficiency	Development Services	
	BD-2: Require New Residential Development Decarbonization	Development Services	
	BD-3: Require Existing Nonresidential Development Energy Efficiency	Development Services	
	BD-4: Require New Nonresidential Development Decarbonization	Development Services	
	BD-5: Decarbonize Existing Buildings	Development Services	
	MBD-1: Implement Energy Efficiency and Decarbonization Projects at Municipal Facilities	Engineering,Parks and Recreation,Public Works	Parks, Recreation & Cultural Arts, Engineering
	MBD-2: Require New Municipal Facilities be All-Electric	Development Services,Engineering	
Clean and Efficient Transportation	CET-1: Implement the Active Transportation Plan	Engineering	
	CET-2: Implement a Flexible Fleet Program	City Manager,Development Services	Development Services
	CET-3: Require Transportation Demand Management Programs for New Nonresidential and Major Redevelopment Projects	Engineering	Development Services
	CET-4: Reduce Vehicle Miles Traveled	Development Services	
	CET-5: Improve Traffic Flow	Engineering	
	CET-6 : Require Existing Residential Buildings to be Electric Vehicle Ready	Development Services	
	CET-7: Require Nonresidential Electric Vehicle Charging Stations	Development Services	
	MCET-1 : Transition to Zero Emission Vehicle Municipal Fleet	Public Works	Fire & Marine Safety
	MCET-2: Implement a Municipal Employee Transportation Demand Management Program	Development Services,Human Resources	Development Services
	MCET-3: Install Public Electric Vehicle Charging Stations	Development Services,Engineering,Parks and Recreation	Parks, Recreation & Cultural Arts, Development Services
Carbon Sequestration	CS-1: Establish a Tree Canopy Goal for the City	Development Services,Parks and Recreation,Public Works	Parks, Recreation & Cultural Arts, Public Works
	CS-2: Enforce Landscape Tree Requirements at New Developments	Development Services	
	CS-3: Incentivize Tree Planting on Private Property	Development Services,Parks and Recreation	
	CS-4: Adopt and Implement a Mature Tree Ordinance	Development Services	
	MCS-1: Plant and Maintain City Trees	Parks and Recreation,Public Works	Public Works
Renewable Energy	MRE-1: Install microgrids with on-site renewable and energy storage at Municipal Facilities	Engineering,Parks and Recreation,Public Works	Parks, Recreation & Cultural Arts, Engineering
	MRE-2: Require New Municipal Facilities to Install Microgrids with On-Site Solar and Battery Storage	Development Services,Engineering	
	RE-1: Maintain membership in San Diego Community Power	Development Services	
	RE-2: Require Existing Nonresidential Buildings to Install Solar Photovoltaic Systems	Development Services	
Zero Emission Equipment	ZE-1: Limit Use of Gas Powered Leaf Blowers	Development Services	
	ZE-2: Develop incentive and outreach programs to accelerate the transition to electric landscaping equipment.	Development Services	
Water Efficiency	WE-1: Support Local Water Districts Water Conservation Efforts	San Dieguito Water District	Development Services
	WE-2: Require New Single Family Homes to be Pre-Plumbed for Greywater Systems	Development Services	
	MWE-1: Convert City-Owned Landscape to Drought Tolerant or Native Species	Development Services	
Zero Waste	ZW-1: Implement a Zero Waste Program	Public Works	
CAP Coordination and Reporting	CCR-1: CAP Coordination and Reporting	City Manager,Development Services,Engineering,Human Resources,Information Technology,Parks and Recreation,Public Works,San Dieguito Water District	All Departments