CITY OF CARMEL-BY-THE-SEA
CLIMATE COMMITTEE

Contact: 831.620.2000 www.ci.carmel.ca.us

All meetings are held in the City Council Chambers
East Side of Monte Verde Street
Between Ocean and 7th Avenues

SPECIAL MEETING
Thursday, July 7, 2022

3:30 PM

Governor Newsom's Executive Order N-29-20 has allowed local legislative bodies to hold public meetings via teleconference and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body. Also, see the Order by the Monterey County Public Health Officer issued March 17, 2020. The health and well-being of our residents is the top priority for the City of Carmel-by-the-Sea. To that end, this meeting will be held via teleconference and web-streamed on the City's website ONLY.

To attend via Zoom https://ci-carmel-ca-us.zoom.us/j/86454029868? Meeting ID 86454029868, Passcode 063664; or to attend via telephone dial 1-646-558-8656?. The public can also email comments to amartelet@ci.carmel.ca.us. Comments must be received 2 hours before the meeting in order to be provided to the committee. Comments received after that time and up to the beginning of the meeting will be added to the agenda and made part of the record.

CALL TO ORDER

PUBLIC APPEARANCES

Members of the public are entitled to speak on matters of municipal concern not on the agenda during Public Appearances. Each person's comments shall be limited to 3 minutes, or as otherwise established by the Chair. Matters not appearing on the agenda will not receive action at this meeting and may be referred to staff. Persons are not required to provide their names, and it is helpful for speakers to state their names so they may be identified in the minutes of the meeting.

ANNOUNCEMENTS

ORDERS OF BUSINESS

Orders of Business are agenda items that require Committee discussion, debate, direction to staff, and/or action.

1. Review the Final Draft Climate Adaptation Plan and Climate Action Plan

This agenda was posted at City Hall, Monte Verde Street between Ocean Avenue and 7th Avenue, outside the Park Branch Library, NE corner of Mission Street and 6th Avenue, the Carmel-by-the-Sea Post Office, 5th Avenue between Dolores Street and

San Carlos Street, and the City's webpage http://www.ci.carmel.ca.us in accordance with applicable legal requirements.

FUTURE AGENDA ITEMS AND ADJOURNMENT

SUPPLEMENTAL MATERIAL RECEIVED AFTER THE POSTING OF THE AGENDA

Any supplemental writings or documents distributed to a majority of the Climate Committee regarding any item on this agenda, received after the posting of the agenda will be available at the Public Works Department located on the east side of Junipero Street between Fourth and Fifth Avenues during normal business hours.

SPECIAL NOTICES TO PUBLIC

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the City Clerk's Office at 831-620-2000 at least 48 hours prior to the meeting to ensure that reasonable arrangements can be made to provide accessibility to the meeting (28CFR 35.102-35.104 ADA Title II).

CITY OF CARMEL-BY-THE-SEA
Climate Committee
Staff Report

July 7, 2022
ORDERS OF BUSINESS

TO:	Climate Committee Members
SUBMITTED BY:	Agnes Martelet, Environmental Compliance Manager; Evan Kort, Associate Planner
SUBJECT:	Review the Final Draft Climate Adaptation Plan and Climate Action Plan

RECOMMENDATION:

Review and approve the Final Draft Climate Adaptation Plan and Climate Action Plan before the upcoming adoption by the City Council.

BACKGROUND/SUMMARY:

The pre-final versions of the Climate Adaptation Plan and Climate Action Plan (Plans) were presented to the Planning Commission on May 11, 2022, the Forest and Beach Commission on May 12, 20022, and the City Council on June 7, 2022 for input. The Climate Committee also hosted two development workshop outreach meetings on April 26 and 28, 2022 to review and discuss the draft Plans. In addition, a community meeting was held on May 24, 2022 as another opportunity for community members to provide input on the draft Plans. At the June 16, Climate Committee meeting, all the comments received were reviewed by the committee for inclusion into the plans before adoption by the City Council.

All the input received, as well as associated report edits have been included in Attachment 1. The revised Climate Adaptation Plan is included in Attachment 2, and the revised Climate Action Plan is included in Attachment 3. No revisions were made to the other appendices of the Climate Adaptation Plan.

Upon approval of the Climate Adaptation and Climate Action Plans by the Climate Committee, these Plans will be presented to the City Council for adoption.

FISCAL IMPACT:

Cost ranges to implement the actions included in the plans are included in the reports. Some actions will require minimal capital investment and will primarily rely on staff time to implement, while other actions will require large capital investments in excess of $100,000 for each action to complete.

ATTACHMENTS:

Attachment 1: Matrix of Comments Received from Public and Community Meetings
Attachment 2: Final Draft Climate Adaptation Plan

Attachment 3: Final Draft Climate Action Plan

Comments Received from Public and Community Meetings
July 7, 2022

Comment Date	Meeting	Comment	Response / Suggested Report Edit
5/11/2022	PC	Support for electrification in new commercial and residential buildings	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Support for reducing the use of automobiles, including higher development density in the downtown to provide housing for people who work in Carmel	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Recommendation for a shuttle service, especially for special events	Added to Planning Commission feedback in outreach section
5/11/2022	PC	Support for further outreach on food waste composting, including solutions for common implementation issues	Added to Planning Commission feedback in outreach section; included in GWR and the City's implementation plan for SB 1383
5/11/2022	PC	Support for increasing forest health and wildfire mitigation, including in Pescadero Canyon	Added to Planning Commission feedback in outreach section; added reference to Pescadero Canyon in the natural resources sections and in Climate Adaptation Measure 2.1.3
5/11/2022	PC	Support for the use of green roofs as cool roofs	Added to Planning Commission feedback in outreach section. Added green roofs in Climate Action Measure 6.2, Action 6.2.1
5/11/2022	PC	Support for prioritized implementation to ensure success.	Added to Planning Commission feedback in outreach section
5/12/2022	FBC	Support for a Grant Writer/Climate Coordinator position	Added to Forest & Beach Commission feedback in outreach section
5/12/2022	FBC	Support for a prioritized implementation to ensure success	Added to Forest & Beach Commission feedback in outreach section
5/12/2022	FBC	Recommendation to add Pescadero Canyon to the list of natural resources	Added to Forest & Beach Commission feedback in outreach section; added reference to Pescadero Canyon in the natural resources sections and in Climate Adaptation Measure 2.1.3
5/12/2022	FBC	Suggestion to expedite bluff monitoring	Added to Forest & Beach Commission feedback in outreach section; engineering evaluation of the bluff is included in the FY 2022-23 CIP
4/26 & 4/28/22	CON	Construction Outreach Meetings held at City Hall.	No additional feedback on the Plans was received.
5/17/2022	CON	Comment from David Knight (Monterey Energy Group) as a follow-up to Construction Outreach meeting: Going all electric in Carmel is not without challenges:	

PC: Planning Commission FBC: Forest and Beach Commission CC: City Council CO: Community Outreach Meeting.
CON: Construction Outreach Meeting MPWMD: Monterey Peninsula Water Management District CAWD: Carmel Area Waste Water District

		• Locating heat pump compressors on small lots. At least 1 compressor for HVAC and likely 1 for Domestic Hot Water. • Tree shading = limited solar access. Given PG&E electric rates, without adequate solar, will likely lead to operating cost 2 or 3 times higher for space heating and DHW. • As opposed to mandating all electric homes, the City might want to look at a reach code that encourages greater comfort, Indoor Air Quality, better acoustics, energy efficiency, and sustainable construction. The new Active House program will help insure all of those features while maintaining architectural freedom.	Added "Active House" to list of outreach materials in CAP Measure 1.1, Action 1.1.1.
5/24/2022	CO	Community Outreach Meeting held at Hofsas House	No additional feedback on the Plans was received.
6/6/2022	MPWMD	Emailed comment from Maureen Hamilton, Water Resources Engineer: MPWMD is interested in being a Partner as described in the Implementation and Monitoring chapter. Climate change and water are inextricably linked, and we would like to be helpful framing and integrating immediate and long term water planning into climate change adaptation. If the Committee is open to including MPWMD as a partner, please email or call and I'll coordinate next steps on our end.	Added MPMWD to the list of "Partners" listed in the Climate Adaptation Plan.
6/7/2022	CAWD	Letter from Barbara Buikema, General Manager Carmel Area Wastewater District has reviewed your Climate Adaptation Plan and would like to offer two comments. We work closely with the City and believe that we have many of the same goals, please accept our comments in that spirit. • Your report focuses on the critical nature of electrical and natural gas infrastructure, but little on sewer infrastructure. We believe sewer is critical to the city, and that climate change impacts that effect the sewer also effect the city. For example, coastal bluff erosion that threatens streets also threatens sewer lines that may be in those streets. • Increased rainfall intensities (that may be brought on by climate change) can increase the amount of stormwater that inadvertently enters the sewers potentially leading to	

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		sewer overflows. Ongoing awareness of stormwater impacts to the sewer by the City and its staff will continue to aid CAWD in managing this potential impact of climate change. We have a program whereby upon sale or remodel of a home more than $50K we require a sewer lateral inspection. These inspections have been instrumental in helping to identify cracks in private laterals that allow stormwater to enter the sewer. We appreciate the coordination that we already receive from City Planning in regard to these efforts. We would also like to bring attention to our upcoming pipeline rehabilitation project planned for the sewer line in Scenic Road that will improve the resiliency of this pipeline. Furthermore, the District has an aggressive 15-year plan to replace sewer lines throughout our service area that should go a long way towards making sure the system is stronger and more resilient. We want to again, ensure the City that we are ready to collaborate on projects where our interests intersect.	Action 3.1.9 updated to include associated infrastructure (ex. sewer lines) in addition to the primary CAWD facility.
6/7/2022	CC	**Staff Question #1 to Council:** The Climate Committee was assembled to develop the Climate Adaptation and Action Plans. As the Plans near completion, Climate Committee members have discussed the possibility of continuing meeting on a reduced schedule to oversee the implementation of certain projects, in particular the coastal engineering study, which will guide coastal infrastructure maintenance and improvement projects in the face of Sea Level Rise. Should the Climate Committee be tasked with this oversight?	Council supports the Climate Committee's continuing oversight of the Coastal Engineering Study. Climate Adaptation Plan revised to state the Climate Committee will be tasked with oversight of the Coastal Engineering Study.
6/7/2022	CC	**Staff Question #2 to Council:** The Adaptation Plan recommends the establishment of a Sustainability Commission to oversee the plans' implementation. Does Council support the establishment of a Sustainability Commission? If not, which elected or appointed body(ies) should be tasked with reviewing and providing feedback on implementation and monitoring?	Council stated that if a Design Review Board (DRB) is re-established, the Planning Commission may be the best body to support implementation of the Plans as the Commission would no longer be responsible for design review responsibilities. If a DRB is not re-established, the Forest and Beach Commission may be the best body because of the natural resources affected by climate change. Council was hesitant to appoint a new Sustainability Commission at this time due to Commissioner volunteer availability, staffing resources, and cost.

			Council noted that all City Departments should be involved in the implementation of the plans, and each Department Director should be involved in the implementation. The Plans recommend a Grant Writer/Climate Coordinator (Action 1.4.4.) as a key position to ensure that the City is making progress on the adaptation actions. -- Added to City Council feedback in outreach section and revised Climate Adaptation Plan to reflect that an existing Board or Commission should take responsibility to oversee the Plans' implementation as opposed to the establishment of a new Sustainability Commission. Retained the recommendation of a Grant Writer/Climate Coordinator for consideration for a future year budget.
6/7/2022	CC	**Staff Question #3 to Council:** Staff has already started to implement these plans by incorporating certain projects in the Capital Improvement Plan and by taking into account Climate Action and Adaptation in City projects such as wildfire mitigation in the Mission Trail Nature Preserve, the Forest Management Plan Update, and Design Guidelines Update. Some of the projects identified in the Climate Adaptation and Action Plans will require significant funding. What additional funding source(s) should be prioritized to implement these projects?	Council did not identify specific or additional funding sources in detail, though the possibility of grants or assessment districts were briefly discussed. A Councilmember stated that because Climate Change is happening, implementing the strategies in the Plans must be achieved, and that there needs to be a commitment of funds as specific projects and measures are ready to be implemented. Future capital improvement projects are to be included in the 5-year Capital Improvement Program -- Added to City Council feedback in outreach section.
6/7/2022	CC	**Staff Question #4 to Council:** The development of these Plans was on the list of Council strategic priorities. As this task gets completed and removed from the strategic priorities, should any action(s) be added to the list to ensure continued emphasis on long-term implementation?	Council stated that the Plans should serve as a "road map," and strategies should pursued and revisited, with the possibility of periodic updates provided to Council. The importance of ongoing implementation was continually emphasized by Council. The City Administrator suggested that once the Plans are adopted, that they can be removed from Council's Strategic Priorities list as a

			completed initiative, and that another initiative, including potentially specific adaptation project(s), could re-populate the list. -- Added to City Council feedback in outreach section.
6/7/2022	CC	**Miscellaneous City Council Comment:** Suggested holding a Community Workshop to generate excitement about serving on a commission and/or supporting the various Adaptation strategies and initiatives.	Added to City Council feedback in outreach section.
6/7/2022	CC	**Miscellaneous City Council Comment:** Specifically stated support of Actions 1.3.3-1.3.5	Added to City Council feedback in outreach section.
6/7/2022	CC	**Miscellaneous City Council Comment:** Recommended the implementation of a public solar project to show leadership in building electrification.	Added to City Council feedback in outreach section and added Action 3.1.3 item to dentify opportunities to incorporate electrification of City facilities and buildings into the Capital Improvement Plan.
6/7/2022	CC	**Public Comment:** A member of the public expressed concern regarding potential impacts to the built and natural environment associated with the increase of wireless and cellular infrastructure.	Added to City Council feedback in outreach section.

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Attachment 2

City of Carmel-by-the-Sea

Climate Adaptation Plan

Final Draft
July 2022

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Acknowledgements

This Climate Adaptation Plan was a coordinated effort among:

- Carmel-by-the-Sea Community Members
- Carmel-by-the-Sea Climate Committee Members
- Carmel-by-the-Sea Planning Commission and Forest & Beach Commission
- Carmel-by-the-Sea City Council
- Carmel-by-the-Sea City Staff
- Agency Partners and Experts who presented at Climate Committee Members
- Rincon Consultants, Inc.

Thank you for participating. We appreciate your feedback, insight, and passion – the Climate Adaptation Plan is better because of you.

Climate Committee Members

Jeff Baron, Council Member
Carrie Theis, Council Member
John Hill
Michael LePage
Scott Lonergan
LaNette Zimmerman
Evan Kort, Associate Planner
Agnes Martelet, Environmental Compliance Manager

Agency Partners and Experts

Citizens Climate Lobby
Association of Monterey Bay Area Governments (AMBAG)
Carmel Area Wastewater District (CAWD)
City of Monterey Fire Department
Monterey County Sustainability Program
Monterey County Office of Emergency Services
U.S. Geological Survey
Monterey Chapter of the American Institute of Architects
Monterey Regional Waste Management District
Monterey Peninsula Water Management District
Central Coast Community Energy
Carmel High School Environmental Club
Ecology Action
David Schonman, coastal ecologist
Sara Davis, City Forester
Bob Harary, Public Works Director
Greg D'Ambrosio, former City Forester & Assistant City Administrator

Table of Contents

Introduction

Introduction and Purpose

This Climate Adaptation Plan establishes an adaptation strategy for the City of Carmel-by-the-Sea (the City) to prepare for the anticipated impacts associated with climate change. Climate change is caused by the addition of excess greenhouse gases (GHGs) to the atmosphere, which traps heat near the earth's surface increasing global average temperatures in what is referred to as the greenhouse effect. This rise in average temperatures across the globe affects sea level rise, precipitation patterns, the severity of wildfires, the prevalence of extreme heat events, water supply, and ocean temperatures and chemistry.[1] According to the Intergovernmental Panel on Climate Change (IPCC), GHGs are now higher than they have been in the past 400,000 years, raising carbon dioxide levels from 280 parts per million to 410 parts per million in the last 150 years.[2] The dramatic increase in GHGs is attributed to human activities[3] beginning with the industrial revolution in the 1800s, which represented a shift from an agrarian and handicraft-based economy to one dominated by industry and machine manufacturing.[4]

Carmel-by-the-Sea is a coastal town, located on the Monterey Peninsula, with vegetation consisting mostly of evergreen and deciduous trees as well as coastal chaparral. Carmel-by-the-Sea, like many cities throughout California, is expected to experience increased climate hazards because of climate change. These include stronger storms, increasing wildfire risk, rising sea levels, extended drought conditions, and increasing temperatures. The impacts of climate change are already being felt throughout California and at least some increase in these impacts is expected even under aggressive global GHG reduction scenarios.[5] However, Carmel-by-the-Sea can adapt by taking steps to prepare the community and its infrastructure for these expected climate changes. Virtually all people and assets in the city will be affected by climate change in some way. Identifying the expected severity of these impacts and steps to adapt to these changes will be critical to minimizing future costs and community impacts. The purpose of the Climate Adaptation Plan is to identify and prioritize climate adaptation actions the City can implement to improve the resilience of its community members, natural environment, critical infrastructure, and built environment.

City Setting

Carmel-by-the-Sea is located on the Monterey Peninsula in northwest Monterey County, California, along the Pacific Ocean. The renowned scenic environment of Carmel-by-the-Sea stems from its two dominant features, the coastline and the central ridge of wooded hills. Highway 1 is the primary roadway linking Carmel-by-the-Sea to surrounding cities. Carmel-by-the-Sea is an area rich in coastal resources and cultural heritage and is popular for visitors across California and the United States. Approximately one square mile in area, the City's elevation ranges from sea level to 500 feet above sea level, sloping gently from Carmel-by-the-Sea Bay up to Highway 1. Vegetation in the vicinity of Carmel-by-the-Sea generally consists of evergreen trees, most notably the native Monterey Pine, in the City and along the coast, deciduous trees along the Carmel River, and coastal chaparral on the Carmel Valley hills. Various species of wildlife inhabit the area, especially in reserves and in undeveloped gulches. Carmel-by-the-Sea's land is largely forested and contains a substantial amount of open space. There are several areas in and around the City that qualify as wildland fire hazard areas. These areas are located to the north and east of the City boundaries and includes Pescadero Canyon, Forest Hill Park, and Del Monte Forest to the north, and Mission Trails Nature Preserve to the east.[6]

1. https://climate.nasa.gov/effects/
2. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf
3. https://climate.nasa.gov/scientific-consensus/
4. https://www.acs.org/content/acs/en/climatescience/greenhousegases/industrialrevolution.html
5. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf
6. https://ci.carmel.ca.us/sites/main/files/file-attachments/environmental_safety_cc_adopted_9-1-09.pdf?1510257865

Adaptation Strategy Lexicon

Several key climate adaptation-related words and phrases are used throughout the plan. The following definitions will be helpful in understanding the overall strategy and the process which led to its development.

- **Mitigation**: An act or sustained actions to reduce, eliminate, or avoid negative impacts or effects.[7]
- **Adaptation**: The process of adjustment to actual or expected climate and its effects. In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.[8]
- **Vulnerability**: The propensity or predisposition to be adversely affected. [9]
- **Resilience**: The capacity of an entity (an individual a community, an organization, or a natural system) to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.[10]
- **Climate Hazard**: A dangerous or potentially dangerous condition created by the effects of the local climate. [11] Climate hazards of concern for Carmel-by-the-Sea are wildfire, increased temperature, drought, intense precipitation, and sea level rise.
- **Impacts**: Effects on natural and human systems. Impacts generally refer to effects on lives, livelihoods, health, ecosystems, economies, societies, cultures, services, and infrastructure due to the interaction of climate hazards and the vulnerabilities of the system or asset effected.[12]
- **Asset/Population**: Asset refers to a community structure or service that is relied on broadly by the City. Population groups are also identified. The purpose of including this information is to indicate which asset or population group the action would protect.
- **Implementation**: The process of putting a decision or plan into effect; execution.

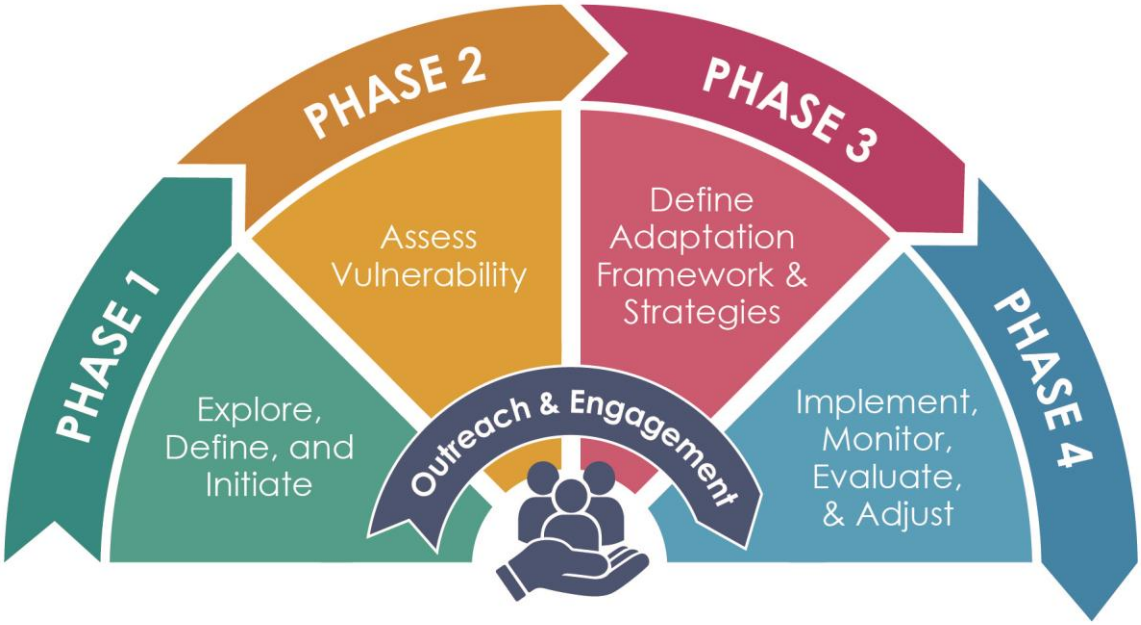
7. https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf
8. https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf
9. https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf
10. https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf
11. https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf
12. https://www.ipcc.ch/site/assets/uploads/2018/03/SREX_FD_SPM_final-2.pdf

Climate Adaptation Plan Process

Background

In September 2019, the City began the process of developing Climate Action and Adaptation Plans that would establish a roadmap to reducing local GHG emissions and identify opportunities to adapt to climate change. The Climate Action Plan is included as Appendix A to the Climate Adaptation Plan. The City followed the climate adaptation planning process recommended by the California Governor's Office of Emergency Services, as documented in the 2020 California Adaptation Planning Guide (2020 CalOES APG), illustrated in the graphic below, and specifically described below.

- **Phase 1.** The City began by convening a Climate Committee to guide the preparation of the Climate Action and Adaptation Plans. The Climate Committee is composed of members of the Carmel-by-the-Sea community, including residents, business owners, and professional experts. The Climate Committee began monthly meetings in November 2019.
- **Phase 2.** To identify the climate hazards specific to Carmel-by-the-Sea and establish a common understanding of the potential climate change impacts in the Carmel-by-the-Sea community, the City completed a Climate Change Vulnerability Assessment (Vulnerability Assessment) in July 2021 (see Appendix B). The Vulnerability Assessment characterizes hazards associated with climate change that are anticipated to impact the community and City-owned assets, describes the community's major climate vulnerabilities, and identifies work that has already been done by the City to improve its resilience to climate impacts. Although the City has a variety of policies and programs already in place to address climate change impacts, policy gaps were identified in the Vulnerability Assessment.
- **Phase 3 and Phase 4**. The City prepared this Climate Adaptation Plan to establish adaptation goals, policies, and actions to address gaps identified in the Vulnerability Assessment. The Climate Adaptation Plan also establishes a roadmap to implementation. Implementing, monitoring, evaluating, and adjusting the Climate Adaptation Strategy (Phase 4), will be led by the City as described in the Implementation and Monitoring Plan section of the report.



Graphic: 2020 California Adaptation Planning Guide (Adaptation Planning Process)

Graphic: 2020 California Adaptation Planning Guide (Phase 3)

The Climate Adaptation Plan was developed pursuant to the steps in Phase 3 of the 2020 CalOES APG, shown in the graphic above.

Step 3.1. The City summarized the findings from the Vulnerability Assessment to aid in developing new policies and actions.

Step 3.2. The City confirmed the goals with the Climate Committee and community members.

Step 3.3. and Step 3.4. The City prepared and prioritized adaptation actions based on adaptation action selection criteria.

Step 3.5. The City incorporated input from stakeholders and community members.

The sections below detail the methodology used to shape the Climate Adaptation Plan.

Vulnerability Assessment Summary

The purpose of the Vulnerability Assessment is to characterize climate hazards that will impact the community and City assets in Carmel-by-the-Sea, determine the community's major climate vulnerabilities, and identify work that has already been done to improve community resilience. The Vulnerability Assessment uses information and modeling projections provided by the State of California to support climate adaptation efforts including the Cal-Adapt modeling tool and the Fourth California Climate Assessment. The City determined that Carmel-by-the-Sea is most vulnerable to the following climate change impacts: stronger storms, wildfires, sea level rise, extended droughts, and increased temperature.

The Vulnerability Assessment also evaluated the impact these climate hazards could have on the following **asset classes** (or types of resources) and *specific assets* present in the city.

- **Natural Assets**: *Mission Trail Nature Preserve, North Dunes, Pescadero Canyon, Urban Forest, Marine Sanctuary, and Carmel Beach*
- **Community**: *Elderly Population and People with Disabilities, Residents, Visitors, Local Businesses, Service Industry Workers, Second Homes*
- **Utilities**: *Water Supply, Sanitary Sewer System, Power Grid, Overhead Communication, Pacific Gas & Electric Company, Underground Lines (Gas, Cable)*
- **Regional Infrastructure**: *Wastewater Treatment Facility, Transportation Infrastructure (Caltrans), Hospital and Emergency Medical Care Facilities, Landfill & Waste Management*
- **Local Infrastructure***: Shoreline Access Infrastructure, Seawalls and Revetments, Storm Drain System, Emergency Response Facilities*

Within each asset class, specific assets were evaluated, as listed in Table 1 below. Each asset was categorized with one of the following climate impacts categories:

- already causing observable impacts or near-term significant risk
- mid- to long-range impacts
- not enough data
- no anticipated impacts

The City reviewed adopted policies and programs for each of the assets and indicated whether the City had already initiated policies or actions to address the climate hazard. This analysis assumes that existing adaptation policies and actions will continue to be implemented. Table 1 presents the results of this analysis, for more details on the vulnerability analysis see Appendix B.

Table 1 Vulnerability Scoring Matrix

Color coding:

Climate change is already causing observable impacts or a near-term significant risk

Climate change poses mid- to long-range impacts

Not enough data

No anticipated impacts

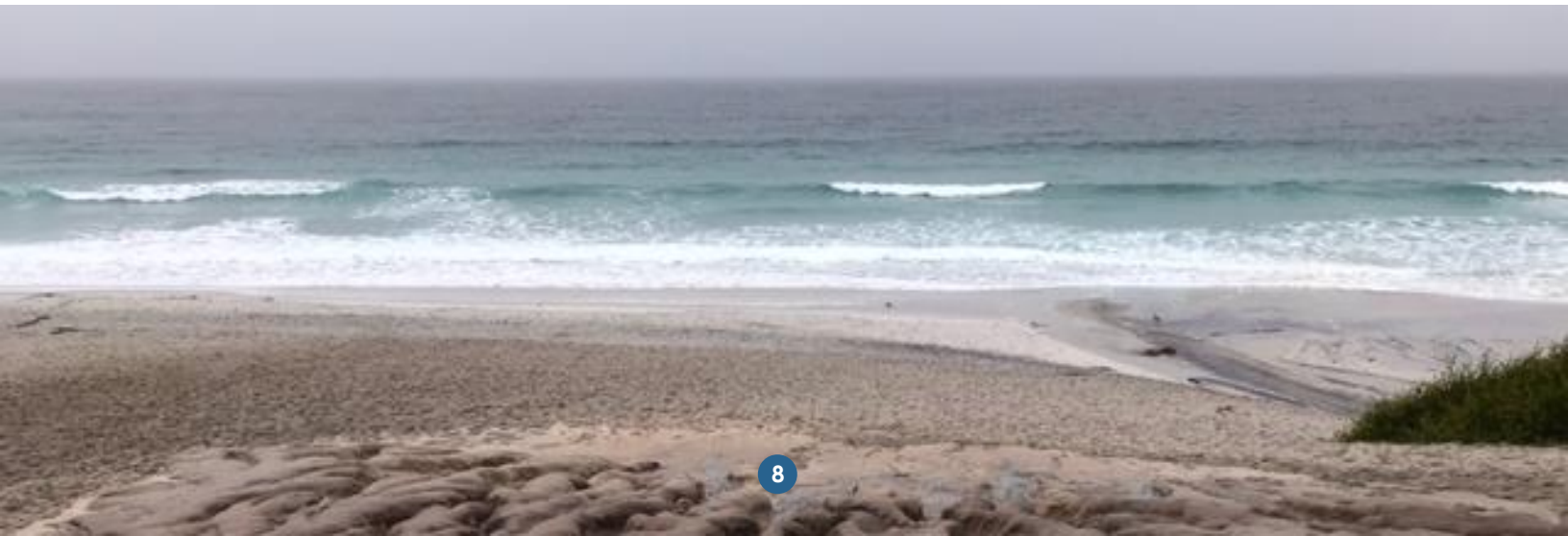
Yes — Some policy/action initiated

No — No policy/action initiated

Priority Assets at Risk	Priority Climate-Related Hazards: Stronger Storms	Wildfires	Sea Level Rise	More Droughts	Increased Temp
Natural Assets					
Mission Trail Nature Preserve	Yes	Yes		Yes	Yes
North Dunes			**No**	Yes	Yes
Urban Forest	Yes	**No**		Yes	**No**
Marine Sanctuary					
Carmel Beach	Yes		Yes		
Community					
Elderly Population and People with Disabilities	**No**	**No**		**No**	**No**
Residents	Yes	Yes		Yes	**No**
Visitors	**No**	**No**			
Local Businesses	**No**	**No**	**No**	Yes	**No**
Service Industry Workers	**No**	**No**	**No**		**No**
Second Homes	Yes	Yes	**No**		

Priority Assets at Risk	Priority Climate-Related Hazards				
	Stronger Storms	Wildfires	Sea Level Rise	More Droughts	Increased Temp
Utilities					
Water Supply		Yes	Yes	Yes	Yes
Sanitary Sewer System			Yes		
Power Grid	**No**	**No**			**No**
Overhead Communication	**No**	**No**			
PG&E/Communication Underground Lines (gas, cable)		**No**	**No**		
Regional Infrastructure					
Wastewater Treatment Facility	Yes		Yes		
Transportation Infrastructure (Caltrans)	Yes	Yes	Yes		
Hospital and Emergency Medical Care Facilities					
Landfill & Waste Management	Yes				
Local Infrastructure					
Shoreline Access Infrastructure	Yes		Yes		
Seawall and Revetments	Yes		Yes		
Storm Drainage System	Yes		Yes		
Emergency Response Facilities (Fire station, EOC, PD, PW, City Hall, etc..)	Yes	Yes			**No**

Notes: Shoreline Access Infrastructure = Scenic trail, public restrooms, beach stairs, coastal roadways, and parking; EOC = Emergency Operations Center; PD = Police Department; PW = Public Works; PG&E = Pacific Gas & Electric Company
Source: Adapted from the July 2021 City of Carmel-by-the-Sea Climate Change Vulnerability Assessment (Appendix B)



Based on identified policy gaps in the Vulnerability Assessment, the Climate Adaptation Plan identifies new policies and programs for the assets considered to be most vulnerable to climate change. Assets and communities that are considered most vulnerable are those that have no policies/actions for increasing resilience and are either currently experiencing observable or near-term risks or those that are expected to experience mid- to long-range impacts (this corresponds to cells in Table 1 that are highlighted orange or yellow and labeled No). Key findings of the Vulnerability Assessment include:

- Carmel-by-the-Sea's natural assets are most vulnerable to wildfire, sea level rise, and increased temperature.
- Carmel-by-the-Sea's communities are vulnerable to all priority climate-related hazards.
- Utilities are most vulnerable to stronger storms, wildfire, sea level rise, and increased temperature.
- Regional infrastructure assets, including the Carmel Area Wastewater Treatment Facility and Highway 1, were determined to be vulnerable to climate change, however, policies and actions have been initiated to address vulnerabilities.
- Policies and actions have been initiated to reduce local infrastructure's vulnerability to stronger storms, wildfires, and sea level rise. No action has been taken to address vulnerability to increased temperature.
- The Climate Committee determined that a coastal engineering study would be necessary to fully assess the potential impacts of sea level rise on City assets and to identify policies and actions to address those impacts.

Stakeholder and Public Input

Outreach

The Climate Adaptation Plan was developed and refined through a stakeholder engagement process with the Carmel-by-the-Sea Climate Committee and the public. Draft versions of the adaptation strategy (goals, policies, and actions) were presented in September and October 2021 to the Climate Committee. Comments received during and following these meetings were incorporated into an updated set of goals, policies, and actions that were then presented at a virtual public workshop in November 2021. Comments received during and following the public workshop were incorporated into the goals, policies, and actions, and presented at the January 2022 Climate Committee meeting for final input. See Appendix C for meeting slides, interactive activity results, and responses to comments.

The Carmel-by-the-Sea Climate Committee provided input along the following themes:

- Support for additional strategies that would improve emergency evacuation, and relieve traffic and congestion
- Identification of additional actions to support vulnerable populations
- Additions to actions to address tree maintenance and protect native species, particularly the Monterey Pines
- Augment actions to include stormwater runoff reduction and increase resilience of the Carmel Area Water District facility

The community provided input along the following themes:

- Support to include a clear evacuation plan for elderly residents
- Applying updated City Planning Guidelines and Development Standards citywide, not just in the Very High Fire Hazard Severity Zone
- Additional opportunities for partnership in adaptation-related community engagement efforts
- Increasing City staff resources to increase staff time for implementation of the strategy

The Climate Adaptation Plan was presented to the Forest & Beach Commission and the Planning Commission in May, and City Council in June 2022 for input.

The Planning Commission was supportive of the plan and provided input on the following:

- Support for electrification,
- Support for reducing the use of automobiles, including higher development density in the downtown to provide housing for Carmel workforce, and the provision of shuttle services, especially for special events,
- Support for further outreach on food waste composting, including solutions for common implementation issues,
- Support for increasing forest health and wildfire mitigation, including in Pescadero Canyon,
- Support for the use of green roofs as cool roofs,

The Forest & Beach Commission provided input on the following:

- Support for the Grant Writer/Climate Coordinator position and for prioritizing implementation to ensure success,
- Suggestion to add Pescadero Canyon to the list of natural resources and to consider it in the adaptation plan,
- Suggestion to expedite bluff monitoring if feasible.

City Council provided input on the following:

- Support for the Climate Committee's continued oversight of the coastal engineering study.
- Recommendation that the Planning Commission be the overseeing body for the implementation of the Climate Action and Adaptation Plans if the Design Review Board (DRB) is re-established, which would free up the Planning Commission's agenda.
- Recommendation that the Forest and Beach Commission oversee the plans' implementation if a DRB is not re-established.

- Recommendation that all City Departments be involved in the implementation of the plans, and that each Department Director should be involved in the implementation.
- Recommendation that funds be allocated for implementation as specific projects and measures are ready to be implemented.
- Support for ongoing implementation of the plans.
- Suggestion to hold a Community Workshop to generate interest from members of the community to serve on a commission and/or to support the various Adaptation strategies and initiatives.
- Support of Actions 1.3.3-1.3.5 (improving the resilience of existing buildings and infrastructure)
- Support for the implementation of a public facility solar project to show leadership in building electrification.
- A member of the public expressed concern regarding potential impacts to the built and natural environment associated with the increase of wireless and cellular infrastructure.
- The Monterey Peninsula Water Management District requested being included as a regional partner, and the Carmel Area Wastewater District offered comments regarding the critical nature of the sanitary sewer and impacts of the climate on it.

Input from the Forest & Beach Commission, the Planning Commission, and City Council were incorporated into the Climate Adaptation Plan, and the Plan was adopted in August 2022.

Adaptation Strategy

Strategy Overview

The Adaptation Strategy presented in this section identifies goals, policies and actions that seek to contribute to increasing resilience to climate change in Carmel.

Goals, policies, and actions are defined as:

- **Goals**: Broad statements describing community desires. The Carmel-by-the-Sea adaptation goals are modeled after the Adaptation Vision and Principles developed by the California Governor's Office of Planning and Research (OPR) Integrated Climate Adaptation & Resiliency Program (ICARP).[13] Each goal is focused on increasing the resilience of one of the following broad asset categories: community, natural assets, and infrastructure (including utilities) and the built environment.
- **Policies**: Specific position statements that support the achievement of goals and serve as guides to City Council, Planning Commission, and City staff, when making decisions.
- **Actions**: Specific methods to incrementally implement and achieve policies and goals.

The intent of the goals, policies, and actions is to address the key vulnerabilities identified in the Vulnerability Assessment, including assets at risk from near-term or mid-term climate change impacts and that lack existing adopted policies or established programs. It is expected that existing adaptation-related policies and actions identified in the City's Vulnerability Assessment will continue to be implemented and re-assessed in the next update of the Climate Adaptation Plan and Vulnerability Assessment, by 2030 at the latest.

13. https://opr.ca.gov/planning/icarp/tac/

Carmel-by-the-Sea's Adaptation Goals

Based on the results of the vulnerability analysis and input from the community and Carmel-by-the-Sea Climate Committee three primary goals were identified. These goals served as a guide for the development of the adaptation actions and policies contained in the Adaptation Strategy.

With these goals in mind, the City, stakeholders, and community provided input on a suite of policies and specific actions that would achieve these goals and result in a more adaptive and resilient Carmel. These specific policies and actions can be found in the Adaptation Policies and Actions section.

Goal 1. A Healthy, Safe, and Resilient Community

Goal 1 is a healthy, safe, and resilient community in the face of climate change. The policies and actions under this goal improve community health, safety, and resilience through equitable and effective emergency preparedness, targeted actions to improve the resilience for vulnerable populations, minimization of negative health impacts from climate change, and economic resilience in the form of support for service industry workers and local businesses. The policies and actions for Goal 1 are provided in Table 2 of the Adaptation Strategy. Goal 1 policies and actions should be prioritized given that community assets are those that have the greatest vulnerability based on the number of hazards they are exposed to and not having policies or actions currently in place to increase resilience (see Appendix B).

Goal 2. A Natural Environment Resilient to Climate Hazards

Goal 2 of Carmel's adaptation strategy is a resilient natural environment. The City's beaches, urban forestry, and parks are all vulnerable to climate hazards. The policies and actions under this goal aim to improve resilience of the community's habitats and ecosystems using studies, partnerships, funding, and structural actions. The policy and actions for Goal 2 are list in Table 3 of the Adaptation Strategy.

Goal 3. Resilient Infrastructure and Built Environment

Goal 3 in the City's adaptation strategy is a resilient built environment. This goal involves policies that address infrastructure redundancies and incorporation of climate change into built environment planning. The actions under these policies are organized by climate hazard-related improvements with each addressing improvements needed to increase infrastructure resilience to climate change. Actions like green infrastructure and storm drain repairs target intense precipitation while actions like bluff monitoring and the hiring of a coastal engineer help the community adapt to sea level rise. The policies and actions for Goal 3 are provided in Table 4 of the Adaptation Strategy.

Adaptation Policies and Actions

Policy and Action Development

In order to achieve each of the three adaptation goals identified in the Adaptation Strategy section above, a suite of adaptation policies and actions were developed. The policies and actions focus on the most vulnerable assets within Carmel-by-the-Sea which were identified through the vulnerability matrix. To guide the creation of effective adaptation strategies for these assets, the City developed selection criteria to prioritize the selection of goals, policies, and actions. These criteria were established to guide the development of policies and specific actions and help promote implementation, equity, and effectiveness. Every Goal contains at least one action that meets each of the criteria established. The following criteria were used to develop and ultimately select Carmel's adaptation actions:

1. Implement adaptation actions that result in **measurable increase in resilience** and reduction in climate change risks.
2. Implement actions that respond to continual changes in climate, ecology, and economics using **adaptive management** that incorporates regular monitoring.
3. Establish governance policies, **institutional structures**, and monitoring processes to implement adaptation actions.
4. Identify **funding** needs, establish funding mechanisms, and allocate adequate funding to support adaptation policy development and implementation.
5. Focus meaningful and active **engagement** with the most impacted communities.
6. Employ adaptive and flexible governance approaches by maximizing collaborative **partnerships** among sectors to accelerate effective problem solving.
7. Prioritize actions that promote **equity**, foster community resilience, and protect the City's most vulnerable populations, including the elderly. Explicitly prioritize communities that are disproportionately vulnerable to climate impacts.

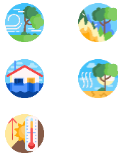
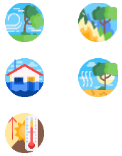
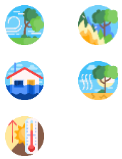
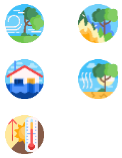
To facilitate implementation of each action by the City, additional information is included for each specific action, as follows:

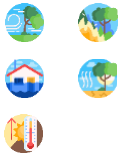
- **Metric**: A way to gauge progress of an action through measurable indicators or benchmarks of progress. This involves quantifying increases in resilience. The metric is a key component of *Phase 4: Implement, Monitor, Evaluate, and Adjust* of the 2020 CalOES APG.[14]
- **Timeframe**: Sorted into phases of near-term (1-2 years, or by 2024), mid-term (3-5 years, or by 2027), and long-term (5-10 years, or by 2023) this categorization helps plan for timing of implementation.
- **Implementation Lead**: The City department or entity that will lead the implementation of the action.
- **Cost**: Sorted into ranges of $-Low (<$25,000), $$-Medium ($25,000 - $100,000), and $$$-High (>$100,000) these estimates are used to determine type and extent of funding and financing needed.

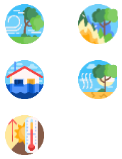
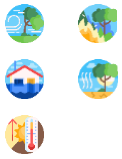
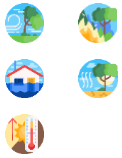
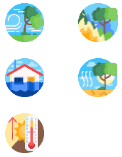
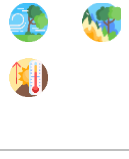
Policies and actions are organized by goal in the following tables.

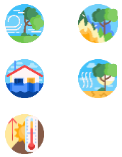
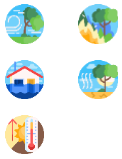
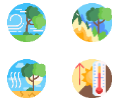
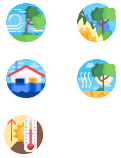
14. https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf

Table 1 Goal 1. A Healthy, Safe, and Resilient Community

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 1.1. Provide effective emergency preparedness and response in anticipation of potential climate-related disasters							
Action 1.1.1. Maintain and Update Evacuation Plan. Maintain and update an Evacuation Plan every 8 years at a minimum to account for all types of emergencies. The plan should focus on the most vulnerable groups including the elderly community and persons with disabilities.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management, Equity	Evacuation Plan updated every 8 years, with the first update by 2023	Near-term (by 2024) and Ongoing	Police and Fire	$
Action 1.1.2. Update Emergency Preparedness. Incorporate climate change risk and impact considerations into Carmel-by-the-Sea CERT programming and materials to promote emergency preparedness at a neighborhood block-by-block scale. CERT to promote block-by-block scale emergency preparedness by organizing City by blocks and recruiting Block Captains.		Residents, Local Businesses, Second Homes	Adaptive Management, Engagement, Measurable Increase in Resilience	Number of block captains formed, climate change risk incorporated into CERT materials	Near-term (by 2024)	Police and Fire	$
Action 1.1.3. Collaborate with Monterey Fire. Collaborate with Monterey Fire on its inspection and outreach efforts to reduce fire risks. Continue to coordinate with the CERT program and reach out to new potential outreach partners such as local businesses, community groups, and utilities to help distribute information to increase resident and homeowner awareness and knowledge of how to prepare for emergencies.		Residents, Local Businesses, Second Homes	Engagement, Partnerships	Number of meetings held with Monterey Fire and CERT program; educational materials distributed	Near-term (by 2024)	Police and Fire	$
Action 1.1.4. Publicize Local Evacuation Routes. Publicize both City and Monterey County evacuation routes for the community on the City's website, and in the newsletter and brochures. Target additional outreach to the most vulnerable such as the elderly and people with disabilities in the event of a wildfire or other disaster.		Elderly Population and People with Disabilities, Residents	Engagement, Equity	Educational materials distributed	Near-term (by 2024)	Police and Fire	$
Action 1.1.5. Evaluate Evacuation Route Capacity. Evaluate evacuation route capacity, safety, and viability under a range of emergency scenarios and identify and implement mitigating actions in 2022, in accordance with Assembly Bill 747.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management	Analysis evaluating evacuation route capacity completed	Mid-term (by 2027)	Police and Fire	$ $

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Action 1.1.6. Evacuation Alternatives and Access. Identify neighborhoods that have single ingress/egress, pursuant to Senate Bill 99, and develop and employ evacuation alternatives, such as a gathering facility, and/or alternative emergency access routes in those neighborhoods. Evaluate potential congestion issues in the event of an evacuation and develop and maintain a list of residents who may have difficulty evacuating. Evaluate options to provide evacuation, such as a shuttle service, for residents with mobility challenges.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management, Engagement, Equity	Analysis identifying neighborhoods that have single ingress/egress and evacuation alternatives completed; List of limited-mobility residents developed	Mid-term (by 2027)	Police and Fire	$$
Action 1.1.7. Develop Local Partnerships to Increase Resistance to Wildfire Structural Damage. Work with local community groups to publicize the Firewise Community Certification program (e.g., on the City website and in the newsletter and brochures) and encourage resident involvement.		Residents, Second Homes	Engagement, Partnerships	Number of meetings held to publicize Firewise Community Certification	Mid-term (by 2027)	Police and Fire	$

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 1.2. Focus adaptation efforts and engagement on the most vulnerable populations.							
Action 1.2.1. Establish a Resilience Hub. Formally designate a physical resilience hub, such as the Youth Center or Public Library, and make it available during extreme heat events, poor air quality, severe weather events, and other highly hazardous conditions for use by the community. Provide the following essential resources in the resilience hub(s): health programming and resources, food, refrigeration, charging stations, basic medical supplies, and other emergency supplies. Electrified heating and cooling paired with backup power sources like battery storage provides redundancy and continues services in the event of a power outage. Designate a virtual resilience hub on the City website where residents can access information about the physical resilience hub and resilience efforts.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Adaptive Management, Equity	Physical and virtual Resilience Hubs established; Existing facilities upgraded to provide all essential resources	Near-term (by 2024)	Public Works/Police and Fire/Library	$ $
Action 1.2.2. Limit the Impacts of Climate Change on the Most Vulnerable Populations. Develop a framework to define equity in Carmel-by-the-Sea and develop adaptation approaches that are equitably implemented.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Equity	Carmel-by-the-Sea Equity Framework developed	Mid-term (by 2027)	Community Planning and Building	$
Action 1.2.3. Engage the Community. Develop educational materials notifying the community about the resilience hub and how to access it by sharing updates across city and community channels. Partner with the CERT program and block captains, and community groups, to prioritize disadvantaged / marginalized communities including the elderly and individuals with disabilities. Identify alternative methods of engagement to reach a wider audience.		Elderly Population and People with Disabilities, Residents, Service Industry Workers	Engagement, Equity	Community engagement plan developed	Near-term (by 2024)	Library/City Hall/Police Department	$
Action 1.2.4. Social Support Network. Collaborate with the Carmel Foundation and other community-based organizations (e.g., Carmel Residents Association) to develop an inventory of locations with isolated elderly residents and people with disabilities and develop a plan for a social support network to increase resilience to climate change, for example by promoting home electrification.		Elderly Population and People with Disabilities	Partnerships, Equity, Engagement	Social support network created; Inventory of locations created	Mid-term (by 2027)	Police Department/ CERT/ Community Planning and Building	$
Action 1.2.5. Back-up Power for Vulnerable Populations. Coordinate with 3CE, PG&E, and emergency management services to establish backup power and emergency grid shutdown protocols that protect the most vulnerable populations.		Elderly Population and People with Disabilities	Partnerships, Equity, Measurable Increase in Resilience	Number of households with backup power established	Long-term (by 2032)	Police and Fire/Public Works	$ $ $

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 1.3. Minimize health impacts of climate change.							
Action 1.3.1. Partner with Monterey County Health Department. Coordinate with Monterey County Health Department to develop and enhance disaster and emergency early warning systems to incorporate objective data and information for potential health threats such as heat-illness, and illnesses complicated by low air quality due to climate change hazards. Include information on early warning systems and other resilience efforts on the City's virtual resilience hub (Action 1.2.1.)		Elderly Population and People with Disabilities, Residents, Local Businesses, Service Industry Workers	Partnerships, Measurable Increase in Resilience	Emergency early warning systems updated	Near-term (by 2024)	Police and Fire	$
Action 1.3.2. Initiate a Heat Pump Retrofit Program. Create a program to help fund property owners to convert HVAC units to heat pumps, which provide water heating and space heating in addition to cooling and can improve indoor air quality and community adaptation to extreme heat. Include a microgrid energy storage component to increase power reliability. Prioritize at-risk populations for retrofit incentives.		Elderly Population and People with Disabilities, Residents, Local Businesses, Service Industry Workers	Measurable Increase in Resilience	Number of heat pumps installed; Number of heat pumps serving at risk residents	Mid-term (by 2027)	Community Planning and Building	$ $ $
Action 1.3.3. Invest in Improving Resilience in Critical Facilities. Invest in sustainable backup power sources to provide redundancy and continued services for critical facilities, including City Hall, Carmel Police Department, Carmel Fire Department, the Libraries, and assisted living facilities, in the event of a power outage triggered by a climate event.		Elderly Population and People with Disabilities, Residents	Measurable Increase in Resilience	Number of critical facilities with sustainable backup power sources.	Mid-term (by2027)	Public Works	$ $ $
Action 1.3.4. Conduct a Feasibility Study for Existing Building Electrification and Back-up Power. Perform an electrification feasibility study/existing building analysis in order to understand the potential for, and associated costs of, electrification retrofitting, including heat pumps, along with on-site energy generation and battery storage to provide a more resilient back-up power supply. Establish a plan for reducing or eliminating natural gas from existing buildings, potentially through a reach code, and building resilience to potential electrical grid shutoffs.		Elderly Population and People with Disabilities, Residents	Adaptive Management	Feasibility Study for Existing Building Electrification and Back-up Power completed	Mid-term (by 2027)	Public Works	$ $
Action 1.3.5. Improve Resilience in Existing Building Stock. Develop a program for identifying funding and incentives to weatherize residential and commercial buildings that addresses severe weather protection, energy efficiency, indoor air quality improvements, and other housing improvements. Include an outreach campaign as part of this program to advertise the benefits of weatherizing and electrifying buildings.		Elderly Population and People with Disabilities, Residents	Funding, Measurable Increase in Resilience, Adaptive Management	Number of retrofitted structures	Long-term (by 2032)	Community Planning and Building	$ $
Action 1.3.6. Promote Funding Opportunities. Work with partners like 3CE and PG&E to identify and promote potential resilience opportunities and accessible funding and financing mechanisms to pay for building electrification, weatherization, and battery backups.		Elderly Population and People with Disabilities, Residents, Local Businesses	Funding, Partnerships, Engagement	Funding identified and promoted to community; Number of projects initiated with incentives	Near-term (by 2024)	Community Planning and Building/Police and Fire/Public Works	$

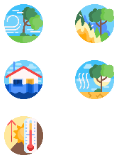
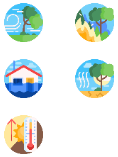
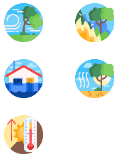
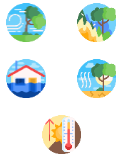
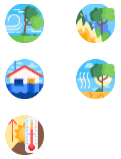
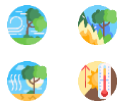
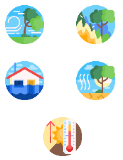
Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 1.4. Increase Economic Resilience							
Action 1.4.1. Develop Partnerships to Provide Support to Displaced Workers. Work in partnership with the Monterey County Workforce Development Board and the Carmel Chamber of Commerce to develop a plan to provide support for displaced workers that establishes education and training partnerships for workers displaced or workers negatively impacted by climate change or climate adaptation policies.		Service Industry Workers, Local Businesses	Partnerships, Equity	Commitment from business community to develop a plan to support displaced workers	Near-term (by 2024)	Community Planning and Building/City Hall	$ $
Action 1.4.2. Establish Partnerships to Develop a Resilient Economy. Partner with the County of Monterey Economic Development Department, Carmel Chamber of Commerce, and the Monterey County Workforce Development Board, to develop more integrated strategies for protection of jobs, economic sustenance, and for the protection of vulnerable populations more at-risk of temporary or permanent job dislocation due to climate change.		Service Industry Workers, Local Businesses	Partnerships, Equity	Number of meetings held to develop strategies for job protection	Mid-term (by 2027)	Community Planning and Building/City Hall	$
Action 1.4.3. Business Resilience Outreach Program. Collaborate with businesses in the city to better understand shared climate risks and identify opportunities to advance shared climate resilience priorities. Partner with the Carmel Chamber of Commerce and Visit Carmel to pilot and implement a local business resilience initiative to build small business capacity before a time of crisis by increasing the awareness of, and preparedness for, business continuity risks faced by the city's local businesses, providing a toolkit of intervention to help local businesses manage risks and enhance business resilience, and conducting outreach campaigns to engage leaders from the business, government, and community sectors to enhance preparedness for economic resilience.		Service Industry Workers, Local Businesses	Engagement, Partnerships	Toolkit of intervention developed to help support local businesses manage risks and enhance resilience	Near-term (by 2024)	Community Planning and Building/City Hall	$ $
Action 1.4.4. Hire a Grant Writer/Climate Coordinator. Hire a grant writer/climate coordinator to pursue available grants to fund climate adaptation implementation and track progress.		All	Funding	Grant writer hired	Near-term (by 2024)	City Hall	$ $ $

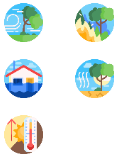
Table 2 Goal 2. A Natural Environment Resilient to Climate Hazards

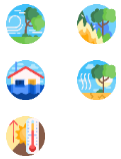
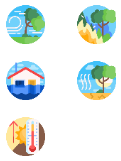
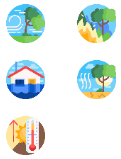
Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 2.1. Protect and restore climate-vulnerable habitat and ecosystems.							
Action 2.1.1. Increase Funding for Climate Adaptation. Earmark Capital Improvement Program (CIP) funding for design, permitting, and implementation of adaptation projects and strategies, such as those in the 2021 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and Integrated Regional Watershed Management Program (IRWMP).		Urban Forest, Mission Trail Nature Preserve, North Dunes, Carmel Beach, Water Supply	Funding	Number of adaptation projects funded through CIP	Near-term (by 2024)	Public Works	$ $
Action 2.1.2. Increase Urban Forest Resilience. Update and implement the Forest Management Plan to: 1. Review and consider modifications to the preferred urbanized tree species that would result in improved resilience in the context of the expected climate of the second half of the century, reduce wildfire hazard, and that takes into account aesthetics and the ecological benefits of natives or near-native (e.g., native species from the Southwestern US or Mexico would likely be preferred to European species). 2. Include planting and maintenance guidelines to improve tree health, particularly in the public right-of-way 3. Incorporate tree species that have greater drought and wildfire resistance 4. In addition to drought-tolerant landscaping, include landscaping guidelines that reduce wildfire hazard on private property. 5. Enhance carbon sequestration potential Update of the Plan should include collaboration and engagement with stakeholders, such as the Monterey Pine Forest Watch, California State University, Monterey Bay, and vulnerable communities.		Urban Forest	Engagement, Equity, Measurable Increase in Resilience, Adaptive Management	Forest Management Plan Updated	Near-term (by 2024) and Ongoing	Public Works Forestry Division /Forest and Beach Commission	$ $
Action 2.1.3. Increase Resilience of the Mission Trail Nature Preserve and Pescadero Canyon. Update and implement the Mission Trail Nature Preserve Master Plan to consider the potential impacts of climate change and to reduce wildfire risk for neighboring private properties. Coordinate with CalFire and the Monterey Fire Departments to incorporate Best Practices into an annual maintenance plan, including cost estimates for implementation and revenue sources for implementation. Continue to coordinate with CalFire and the Pebble Beach Community Services District on wildfire mitigation in Pescadero Canyon.		Mission Trail Nature Preserve	Adaptive Management, Partnerships, Funding	Mission Trail Nature Preserve Master Plan updated	Mid-term (by 2027) and Ongoing	Community Planning and Building and Public Works	$ $
Action 2.1.4. Increase Resilience of the North Dunes. Continue to fund maintenance and monitoring at the North Dunes to determine how the changing climate will affect dune habitats. Implement enhancement efforts to improve resilience of the North Dunes.		North Dunes	Funding, Adaptive Management, Measurable Increase in Resilience	Regular maintenance and monitoring occurring at North Dunes	Ongoing	Community Planning and Building and Public Works	$ $

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Action 2.1.5. Increase Resilience to Stronger Storms. When designing projects in the city, including those recommended in the Mission Trail Stream Stability Study, size improvements to handle larger storms consistent with best available climate change projections.		Mission Trail Nature Preserve	Institutional Structures, Adaptive Management, Measurable Increase in Resilience	Number of projects sizing improvements to handle larger storms.	Near-term (by 2024)	Public Works	$$
Action 2.1.6. Beach Sand Monitoring Program. Reinstate beach sand monitoring program described in the Shoreline Management Plan.		Carmel Beach	Adaptive Management	Active beach sand monitoring program in place	Near-term (by 2024)	Public Works	$$
Action 2.1.7. Carmel Cove Sand Supply. Partner with local researchers (e.g., California State University Monterey Bay) or other sources to conduct Carmel Cove sand supply dynamics analysis.		Carmel Beach	Partnerships	Carmel Cove sand supply dynamics analysis completed	Long-term (by 2032)	Community Planning and Building and Public Works	$$

Table 3 Goal 3. Resilient Infrastructure and Built Environment

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 3.1. Support greater resilience, redundancy, and reliability of local and regional infrastructure and the built environment.							
Action 3.1.1. Underground Utilities in Fire Hazard Zones. Determine the feasibility of, and community support for, undergrounding power lines in the Mission Trail Nature Preserve, designated evacuation routes, and in other high priority areas in the Very High Fire Hazard Severity Zone. Develop a plan for undergrounding utilities based on results from the feasibility study and begin implementation in the most vulnerable communities.		Water Supply, Sanitary Sewer System, Power Grid, Overhead Communication, PG&E/Communication Underground Lines- gas, cable	Measurable Increase in Resilience, Equity	Feasibility Study completed; Plan developed based on Feasibility Study; Number of utilities moved underground	Near-term (by 2024)	Community Planning and Building and Public Works	$$$
Action 3.1.2. Increase Green Infrastructure. Modify Capital Improvement Program (CIP) project design to consistently evaluate the potential for green infrastructure to be incorporated in CIP projects in the public right-of-way and on public lands. Identify and develop a green infrastructure pilot project that will reduce runoff volume and capture and infiltrate stormwater, based on projected changes in precipitation amounts due to climate change, and incorporates tree and shrub planting to increase carbon sequestration in the city.		Urban Forest, Storm Drain System	Institutional Structures, Measurable Increase in Resilience	Change in impervious surface coverage.	Near-term (by 2024)	Public Works	$$
Action 3.1.3. Public Building Electrification. Identify opportunities to incorporate electrification of City facilities and buildings, including solar photovoltaic power system and battery backup installation, into the Capital Improvement Program (CIP). As an initial step, identify and develop a pilot project to electrify a city building or facility, including the installation of a photovoltaic power system.		Power Grid, City Facilities	Institutional Structures, Measurable Increase in Resilience	Public building electrification pilot project completed.	Near-term (by 2024)	Public Works	$$$
Action 3.1.4. Reduce Stormwater Runoff. Reduce stormwater runoff through implementation of stormwater diversion and infiltration projects that reduce pollution problems caused by more frequent and intense storms and more extreme flooding events.		Storm Drain System, Carmel Beach	Measurable Increase in Resilience	Stormwater diversion project implemented	Long-term (by 2032)	Public Works	$$$
Action 3.1.5. Storm Drain Repair Funding and Improvements. Earmark Capital Improvement Program (CIP) funding for design, permitting and implementation of storm drain repairs. Include strategies in the 2021 Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) for potential regional funding. Upsize Storm Drain Master Plan (SDMP) improvements, especially when making repairs in the lower reaches of watersheds, to handle larger storms.		Storm Drain System	Funding	Number of adaptation projects funded through CIP	Near-term (by 2024)	Public Works	$$$

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Action 3.1.6. Retrofit Existing Critical Buildings and Related Infrastructure. Conduct an evaluation of all first-responder and municipal facilities to determine retrofits that may be needed for long-term resilience to climate change hazards including sea-level rise related flooding and erosion, increased wind/storm events, an increase in high heat days, and/or wildfire depending upon location and risk factors. Develop a budget and schedule for retrofits based on the findings of the municipal facilities. Retrofit existing critical buildings as detailed in the program schedule.		Emergency Response Facilities – Fire station, EOC, PD, PW, City Hall, etc., Hospital and Emergency Medical Care Facilities	Measurable Increase in Resilience, Funding	List of critical buildings and related infrastructure requiring retrofits	Near-term (by 2024)	Public Works	$$$
Action 3.1.7. Water Conservation. Partner with the Monterey Peninsula Water Management District to reduce water demand and increase water recycling, such as stormwater capture and grey water reuse, through education and outreach. Provide information and incentives for residential water use reduction, focusing engagement on vulnerable communities first.		Water Supply	Partnerships, Equity, Engagement	Water demand reduced, incentives for grey water reuse developed and shared	Near-term (by 2024)	Community Planning and Building and Public Works	$
Action 3.1.8. Bluff Structural Monitoring Program. Implement bluff structural monitoring program and do follow-up monitoring post-storm to identify additional footing stability issues.		Carmel Beach	Measurable Increase in Resilience	Bluff structural monitoring program implemented	Mid-term (by 2027)	Public Works	$$
Action 3.1.9. Sea Level Rise Coastal Vulnerability Study. Hire coastal engineer with experience in planning for climate change to: (1) Conduct research and prepare a Sea-Level Rise Vulnerability Study to further assess the risks to the city's coastal assets, including the beach, sea walls, revetments, bluffs, stairs and access, public bathrooms, parking areas, drainage infrastructure, and utilities. (2) Determine adaptation measures and Local Coastal Program policy options, including but not limited to: a) Mostly natural, unarmored North Dunes area; b) mostly armored bluffs along Scenic Roach south of 8th Avenue; c) Unarmored dunes along private property between 8th Avenue and Del Mar Parking Lot; d) Armored private properties on the bluffs at the north end of the City (Pescadero Canyon area). (3) Evaluate the use of thresholds for phasing adaptation projects based on changing coastal conditions. Consider applying an adaptive pathways approach which establishes trigger thresholds for different adaptive measures based on the severity of the impact from flooding and erosion associated with sea-level rise.		Carmel Beach, Shoreline Access Infrastructure, Seawall and Revetments	Adaptive Management	Sea-level rise vulnerability study completed	Near-term (by 2024)	Public Works	$$$
Action 3.1.10. Wastewater Treatment. Collaborate with the Carmel Area Wastewater District (CAWD) to increase the facilities and associated infrastructure (ex. sewer lines) resilience to sea level rise and stronger storms. Maintain staff/council personnel as liaisons to CAWD.		Water Supply, Storm Drain System	Partnerships	Number of collaboration meetings with CAWD regarding facility's resilience	Near-term (by 2024) and Ongoing	Community Planning and Building and Public Works	$

Action	Climate Hazard	Asset/Population	Criteria	Metric	Timeframe	Implementation Lead	Cost
Policy 3.2. Incorporate climate change adaptation into relevant plans and standards.							
Action 3.2.1. Development Standards. Evaluate City's development standards for consistency with best practices for reducing climate change risk (e.g., wildfire risk) for both new and existing development, including but not limited to incorporating defensible space design in landscaping guidelines and permitting the use of fire-resistant building materials that may conflict with current Design Guidelines. Develop a project checklist for building and site adaptation measures. The checklist, included with permit applications, should serve to provide education to permit applicants on modifications to site plans and structures that can improve a project's resilience to existing and potential future climate change hazards.		Residents, Local Businesses, Second Homes	Institutional Structures, Adaptive Management	Number of projects implementing adaptation measures, City development standards consistent with best practices for reducing wildfire risk	Mid-term (by 2027)	Community Planning and Building	$$
Action 3.2.2. Update City Planning Guidelines. Update the City's municipal code to maintain consistency with current California codes (California Building Code Chapter 7 and California Residential Code R337) throughout the City.		Residents, Local Businesses, Second Homes	Institutional Structures, Adaptive Management	City municipal code consistent with current California codes	Near-term (by 2024)	Community Planning and Building	$$
Action 3.2.3. Incorporate Climate Change Adaptation into Local Plans. Prioritize the update of local plans, including the Climate Change Vulnerability Assessment, Local Coastal Program, General Plan, Mission Trails Nature Reserve Master Plan, Del Mar Master Plan, Shoreline Management Plan, and drought planning to promote climate change resilience as new information is available.		All	Adaptive Management	Number plans updated to incorporate adaptation	Mid-term (by 2027)	Community Planning and Building/Public Works	$$
Action 3.2.4. Update Shoreline Management Plan. Update Shoreline Management Plan and Local Coastal Program based on results of Sea-level Rise Vulnerability Study.		Carmel Beach	Adaptive Management	Shoreline Management Plan and Local Coastal Program updated	Long-term (by 2032)	Community Planning and Building and Public Works	$$
Action 3.2.5. Multi-Jurisdictional Hazard Mitigation Plan. Maintain a comprehensive list of projects, based on existing plans and gaps identified in the Vulnerability Assessment, to provide to Monterey County during updates to the Monterey County Multi-Jurisdictional Hazard Mitigation Plan in 2022 and beyond.		All	Adaptive Management	Number of adaptation projects included in the Multi-Jurisdictional Hazard Mitigation Plan	Near-term (by 2024)	Community Planning and Building, Police, and Public Works	$

Implementation and Monitoring

Implementation

Implementation of the Climate Adaptation Plan will require City staff time and resources, along with strategic collaboration and leadership among key partners and regular and meaningful community engagement. Implementation of actions will require regular tracking and reporting to measure progress against established goals. This section describes the guidance, tools, responsibilities, and analysis required to effectively implement and monitor progress with the adaptation strategy. An implementation guide, which provides each adaptation action sorted by timeframe for implementation and organized by goal and policy, can be found in Appendix D. The appendix includes relevant case study examples to illustrate how policies and actions are being transformed into specific projects and programs.

Implementation Roles and Responsibilities

Effective implementation of the Climate Adaptation Plan will not only require coordination and leadership from the City and its partners, but also the active engagement and development of partnerships with community stakeholders, local businesses, and residents to achieve steady progress towards the City's climate resilience goals.

City's Role

The City will serve as the direct lead in the implementation and monitoring of the Climate Adaptation Plan. The City should incorporate the actions of the Climate Adaptation Plan into the operations, financial decision-making, community engagement, and overall planning processes. In alignment with the climate adaptation goals and policies, the City should update city services, building codes, and related programs, and pursue revenue and funding sources for implementing adaptation actions and projects. The City will be responsible for ensuring that the plan remains a relevant document informed by the best available science and is reviewed, evaluated, and updated on a consistent basis. Through the implementation, review, and updating process, the City should continue to actively engage vulnerable populations, such as the elderly and individuals with disabilities, through public workshops and other engagement opportunities to develop adaptation strategies that are inclusive, equitable, and effectively addressing community needs. City departments and entities tasked with leading implementation of adaptation actions include Public Works, Police & Fire, Community Planning & Building, the Library, City Hall, and the Community Emergency Response Team (CERT). See Appendix D, which shows which department is responsible for leading each action. The Adaptation Strategy identifies a Grant Writer/Climate Coordinator (action 1.4.4.) as a key position to ensure that each City department lead is making progress on their adaptation actions. Appendix D provides a detailed implementation guide indicating the appropriate City lead for each action with actions sorted by timeframe for implementation. The City Council should also consider establishing and appointing a new Sustainability Commission to support the implementation of the Climate Adaptation Plan by providing feedback on progress reports as described below in the Reporting on Progress section.

The Role of Partners

Partnerships will allow for efficient problem solving, regional collaboration for feasibility studies and other adaptation-related work, and the ability to widely communicate resources. To facilitate implementation of some of the actions, the City should coordinate with several key partners, as identified below.

Table 5 Partner Role

Organization	Partner Description and Opportunities
Fire Protection	
Firewise USA	Firewise USA provides as framework of communities and neighbors to organize and participate in wildfire risk mitigation efforts. Once a local fire safe council/neighborhood has been certified, the City should partner with the group to increase community resilience to wildfire.
California Department of Forestry and Fire Protection (CAL FIRE)	CAL FIRE protects and stewards over 31 million acres of California's privately owned wildlands. The Department also provides emergency services in 36 of the State's 58 counties through contracts with local governments and prevents wildfires in the State Responsibility Area (SRA). The City should apply for grant funding from CAL FIRE to better prepared for wildfires.
Monterey Fire	Monterey Fire serves an area of about 400 square miles and provides fire and emergency services as well as community education programs to Carmel and other jurisdictions in Monterey County. The City should regularly partner with Monterey Fire on defensible space code enforcement, education and outreach, and emergency preparedness.
National and Statewide Partners	
The U.S. Army Corps of Engineers	The U.S. Army Corps of Engineers provides engineering solutions to reduce disaster risk and energize the economy. They also have a regulatory program to protect the nation's aquatic resources and navigable capacity. The City should coordinate with the U.S. Army Corps of Engineers to implement projects related to coastal flood hazard reduction and/or habitat restoration that would serve as adaptation strategies.
California Department of Transportation (Caltrans)	Caltrans is responsible for designing, building, and maintaining the State's transportation system, including Highway 1. The City should partner with them to discuss feasible sea-level-rise adaptation strategies.
The California Coastal Commission	The California Coastal Commission plans and regulates the use of land and water in the coastal zone. The City should continue to collaborate with the California Coastal Commission regarding planning for sea level rise and climate change through Local Coastal Program updates.
Utilities	Electric, gas, cable, telephone, and other utility companies contain assets that will be affected by climate hazards. The City should coordinate with these utilities to discuss feasible adaptation strategies.
Regional Partners	
Association of Monterey Bay Area Governments (AMBAG)	AMBAG leads regional collaboration and services to analyze, plan and implement regional policies for Counties and Cities of Monterey, Santa Cruz, and San Benito. The City should collaborate with AMBAG to plan and implement regional-scale adaptation strategies.
Central Coast Community Energy (3CE)	3CE is a Community Choice Energy agency that sources clean and renewable electricity for Monterey, San Benito, and Santa Cruz and parts of San Luis Obispo and Santa Barbara counties. The City should collaborate with 3CE to plan and implement adaptation strategies that increase electricity reliability in the face of climate hazards.

Organization	Partner Description and Opportunities
The Central Coast Climate Collaborative	The Central Coast Climate Collaborative is a membership organization cultivating a network of local and regional community leaders throughout six Central Coast counties to address climate change mitigation and adaptation. The City could consider participating in the Central Coast Climate Collaborative to share best practices and information with other local and regional agencies.
Monterey Peninsula Water Management District (MPWMD)	MPWMD serves approximately 112,000 people within the cities of Carmel-by-the-Sea, Del Rey Oaks, Monterey, Pacific Grove, Seaside, Sand City, Monterey Peninsula Airport District and portions of unincorporated Monterey County. Climate change and water are inextricably linked, and the city should maintain staff and council liaisons to help frame and integrate immediate and long term water planning into climate change adaptation.
County-based Partners	
The Monterey County Health Department	The Monterey County Health Department is a membership organization cultivating a network of local and regional community leaders throughout six Central Coast counties to address climate change mitigation and adaptation. The City could consider participating in the Central Coast Climate Collaborative to share best practices and information with other local and regional agencies.
The Monterey County Workforce Development Board (WDB)	The Monterey County Workforce Development Board coordinates with public and private partners to train and place individuals with the skills that employers need. WDB provides job seekers with connections, services, and resources needed to successfully join the workforce. The City should partner with WDB to establish education and training partnerships for workers displaced or negatively impacted by climate change.
The County of Monterey Economic Development Department	The County of Monterey Economic Development Department coordinates and facilitates the County's efforts to attract, return, and grow businesses and jobs and provide affordable housing throughout the County. The City should work with the County of Monterey Economic Development Department to develop more integrated strategies for job protection, economic sustenance, and the protection of vulnerable populations more at risk of temporary or permanent job dislocation due to climate change.
California State University (CSU) Monterey Bay	CSU Monterey Bay, founded in 1994, is a public, coeducational institution that provides undergraduate degrees, graduate degrees, and teacher certifications. The City should partner with CSU Monterey Bay to conduct local adaptation-related studies.
City-based Partners	
Carmel Area Wastewater District (CAWD)	CAWD provides wastewater treatment services Carmel-by-the-Sea and is owned, operated, and managed by the community via an elected Board of Directors. The City should maintain staff or council personnel as liaisons to CAWD to increase the facility's resilience to sea level rise and stronger storms.
Neighboring Cities	Neighboring cities include Monterey, Pacific Grove, Salinas, Del Rey Oakes, Marina, Sand City, and Seaside. The City should stay in regular communication with neighboring jurisdictions to share best practices and information on adaption planning, to jointly conduct needed monitoring, and to coordinate on issues that cross jurisdictional boundaries.

Organization	Partner Description and Opportunities
The Carmel Foundation	The Carmel Foundation is a Carmel-based membership organization with over 3,000 members 55 years of age and older that facilitates interactive programs, activities, and classes for its members. The City should partner with the Carmel Foundation to develop and plan for a social support network to increase resilience to climate change.
Local community and volunteer groups	Local community and volunteer groups can help disseminate adaptation-related information and workshops to all residents and communicate information back to the City.
The Carmel Chamber of Commerce	The Carmel Chamber of Commerce provides programs, workshops, and networking to promote the businesses in the City of Carmel. The City should partner with the Carmel Chamber of Commerce to increase economic resilience by developing strategies for job protection in the face of climate change.
Visit Carmel-by-the-Sea	Visit Carmel-by-the-Sea provides exclusive offers, itineraries, and resources for visitors to utilize when planning a visit to the City. The City could coordinate with Visit Carmel-by-the-Sea to distribute evacuation information to visitors, in the event of a climate change-induced disaster.
Carmel Unified School District	Carmel Unified School District serves communities in Carmel-by-the-Sea, Carmel Valley, and Big Sur, and has three elementary school, one middle school, one high school, one continuation high school, adult programs, preschool, and before/after school programs. The City could coordinate with the school district to provide resilience hubs in the community.

These partners are well positioned to support implementation of adaptation actions from the Plan that align with the respective expertise or jurisdictional mandate of each partner organization. For example, the Monterey County Health Department is best positioned to provide City emergency providers with information and data regarding potential health threats associated with climate change hazards for incorporation into disaster and emergency early warning systems. Similarly, the Carmel Foundation and Carmel Residents Association have the connections and expertise to support the development of a plan for a social support network that improves communication among vulnerable populations regarding climate change. Climate Adaptation Plan partners can utilize their expertise, relationships, and resources to work with the City on implementing adaptation-related engagement efforts, planning, and other related projects.

The Role of Business

A large portion of local businesses in the City is in the hospitality industry. Businesses, such as restaurants, hotels, and art galleries, can serve as key Climate Adaptation Plan partners by promoting outreach events and campaigns that center the engagement of the community in conversations around climate risks and concerns. The City should partner with the Carmel Chamber of Commerce, the Monterey County Workforce Development Board, and the County of Monterey Economic Development Department to support businesses in developing continuity plans and guidelines that support economic resilience, protect vulnerable workers, and prepare for emergency and disaster events. Businesses should explore opportunities to build resilience to climate hazards through improving emergency preparedness, electrifying equipment and procuring battery storage to prepare for potential electrical grid shutoffs.

The Role of Residents

Residents of the City should focus on utilizing the resources and programs developed as a result of the Climate Adaptation Plan to become better informed on ways to prepare for climate change hazards events. Residents can participate in outreach campaigns and local programs to build personal and community resilience.

Residents can create a buffer, or defensible space, between their properties and grass, trees, shrubs, or any wildland area that surround them to help slow or stop the spread of wildfire and help protect their homes. They can also become involved in Carmel-by-the-Sea CERT programming to become better informed on emergency preparedness and promote community scale awareness and disaster mitigation. Another possible avenue for resident participation in the Adaptation Strategy is to convert HVAC units to heat pumps for water heating and space heating in addition to cooling, which can improve indoor air quality and community adaptation to extreme heat.

Funding and Financing Mechanisms

Effective implementation of the Climate Adaptation Plan will require capital investment, funding, and staff time to update and create plans, develop standards and best practices, design programs, conduct studies, maintain projects, and upgrade and institute infrastructure improvements. While some actions have significant costs, some costs can be reduced through the utilization of grants, incentive programs, subsidies, and low interest financing, lessening the financial burden on the City and community.

The City should develop a funding and financing plan to fund the more costly actions in the adaptation strategy. In this plan, the City should consider the following revenue sources.

- **Assessment and Abatement Districts**, often financed through the collection of supplemental tax assessments, allow for the better assessment of hazards and increased funding for maintenance, repairs, and improvements. An example of an Abatement District is provided in Appendix E.
- **Infrastructure Financing Districts**, allow for incremental property tax revenues to be devoted to a specific purpose. Once an infrastructure financing district is established and priority projects have been identified as part of the business plan, funds can be drawn from changes in local tax revenues occurring as part of redevelopment or rezone, or can be used to apply for grant funds.

- **A Shoreline Account** can serve as the primary account where funds generated for future adaptation programs and maintenance would be kept in reserve.
- **Development Impact Mitigation Fees or In-Lieu Fees** can generate funds for implementing adaptation strategies. The City could consider establishing a fee program, similar to those established by the California Coastal Commission, to administer fees for habitat damages. These fees could be used to implement habitat restoration projects and maintenance.
- **Bonds** allow municipalities to borrow money from investors, which is then repaid to the investor over an established period at a certain rate. Green bonds are a new market that has emerged to specifically fund adaptation infrastructure.
- **Taxes** can be imposed to fund adaptation strategies. The City can impose a special tax with two-thirds majority voter approval. The taxing agency must publish an annual report including the tax rate, the amounts of revenues collected and expended, and the status of any project funded by the special tax.
- **Grants**. The City should also explore state and federal funding sources such as FEMA's Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program, Caltrans Adaptation Planning Grant Program, CAL FIRE's Fire Prevention Grants Program, and the California Coastal Commission and California Coastal Conservancy – Local Coastal Program Local Assistant Grant Program and Climate Ready Grants.

The appropriate revenue source option should consider applicability to climate adaptation, revenue potential, and ease of authorization.

Monitoring and Evaluation

The City will lead the monitoring of the Climate Adaptation Plan to assess the effectiveness of the adaptation and resilience strategies and to confirm alignment with changing climate conditions and associated risks. To maintain consistency with the 2020 CalOES APG, the City should designate one department as the responsible agency for carrying out monitoring activities for adaptation action. As noted in the Adaptation Strategy (action 1.4.4), a Grant Writer/Climate Coordinator should be hired within the Public Works Department to lead monitoring and evaluation of the Climate Adaptation Plan. While some adaptation actions can be implemented using existing staff time, full Climate Adaptation Plan implementation will require additional staff and consultant time to coordinate implementation of the Climate Adaptation Plan and monitor progress. Responsibilities will include collecting and compiling all monitoring data and conducting an overall assessment of effectiveness annually. The City should follow monitoring with annual evaluation of the adaptation actions to be able to adjust in line with community needs. Re-evaluation of adaptation strategies should occur when an adaptation strategy is identified as losing effectiveness. When an adaptation action loses effectiveness, the vulnerability and susceptibility of the populations, assets, resources, and/or operations it affects should be reassessed.

The Climate Adaptation Plan should be monitored through tracking quantitative metrics to assess progress towards achieving the adaptation goals. For example, for Action 1.3.2, the City would track the number of heat pumps installed and for Action 3.1.2, the City would track the change in impervious surface coverage.

Annually, policy performance should be monitored and reported to determine the extent to which the City is achieving the adaptation policies and goals. The City should also track quantitative metrics that gauge compliance with the policies. For example, for Policy 3.2, the City would track the number of relevant plans and standards that were updated to incorporate climate change adaptation. To evaluate how adaptation strategies are considering and addressing the concerns of vulnerable populations, the City should consider defining and annually measuring a series of equity-related metrics and communicating findings through an online reporting system. The Climate Adaptation Plan should be monitored and evaluated simultaneously with the City's greenhouse gas reduction actions to measure the City's overall progress towards acting on climate change and increasing community resilience.

Reporting on Progress

The City should produce an annual report describing achievement towards the Climate Adaptation goals, policies, and actions. The report could be posted on the City website and disseminated into the community, with support from engagement partners. The report should contain quantitative information regarding metric tracking as well as lessons learned and future plans to address challenges. It is recommended that the City establish a new Sustainability Commission to be responsible for reviewing the report, providing feedback on progress, and sharing any concerns around the strategies for increasing community resilience. Alternatively, this responsibility could be assigned to the Planning Commission or the Forest and Beach Commission. With guidance from the assigned Commission, City and partner staff, and the community, the City should update to the Climate Adaptation Plan on or before 2030.

Updating the Climate Adaptation Plan and Vulnerability Assessment

The Vulnerability Assessment and Climate Adaptation Plan should be updated to incorporate new climate science data, shifting community priorities, implementation hurdles, changes in best practice, and technological advances. The Climate Committee determined that a coastal engineering study will be necessary to fully assess the impacts of sea level rise on City assets and to determine policies and actions to address those impacts. The Climate Adaptation Plan should be updated once this study has been completed. The City Council was supportive of the Climate Committee continuing with oversight of the coastal engineering study. It is important that through each iteration of the Vulnerability Assessment and Climate Adaptation Plan, the City continue to engage key stakeholders, the community, and vulnerable populations.

Data Gaps

In the next update of the Vulnerability Assessment, the City should reassess impacts for which not enough data was available during the July 2021 update (see Appendix B). These include:

- Impacts of stronger storms on
  - Marine sanctuary, sanitary sewer system, hospital and emergency medical care facilities
- Impacts of wildfires on
  - Hospital and emergency medical care facilities
- Impacts of sea level rise on
  - Mission Trail Nature Preserve, landfill and waste management, coastal natural assets, coastal infrastructure assets
- Impacts of more drought on
  - Marine sanctuary
- Impacts of increased temperature on
  - Marine sanctuary, overhead communication, hospital and emergency medical care facilities
- Impacts of fog on
  - Mission Trail Nature Preserve, North Dunes, urban forest, marine sanctuary
- Impacts of ocean warming on
  - Marine sanctuary, visitors, local businesses

Attachment 2

Attachment 3

City of Carmel-by-the-Sea Climate Action Plan

The Path Forward

Adopted by the Carmel-by-the-Sea City Council
on _____

Final Draft
July 2022

Credits and Acknowledgments

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Many thanks to the members of the public who have attended the Climate Committee meetings starting in November 2019 and provided valuable input throughout the plan development process.

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INTRODUCTION

Rising concentrations of carbon dioxide and other greenhouse gases are altering temperature and rainfall patterns and contributing to rising sea levels globally. In California, recent historic wildfires, droughts, floods, mudslides, and public safety power shutoffs represent the types of climate change impacts that will continue to be experienced with increasing frequency and severity. Although climate change is a global issue, regional and local governments are uniquely positioned to identify the specific risks and most effective solutions for their communities.

Recognizing the importance of local action, the City of Carmel-by-the-Sea (City) Climate Action Plan (CAP) presents measures that will serve as a road map to meeting Carmel-by-the-Sea's greenhouse gas (GHG) emission reduction targets. It addresses government operations emissions under the City's control, as well as community-wide emissions. The emissions reduction measures build on existing plans, policies and practices already adopted by the City and other regulators, and are consistent with statewide climate legislation. This plan is a companion document to the City's Climate Adaptation Plan and includes several measures that not only reduce the community's GHG emissions but also improve public health and community resilience.

Scope of the Climate Action Plan

This Climate Action Plan consists of the following elements:

(1) a greenhouse gas emissions inventory (summarized in this chapter and provided in full as Appendix A),

(2) a 2030 greenhouse gas emissions target and forecast, and a 2045 carbon neutrality goal, in line with Statewide goals,

(3) an action plan to meet these targets, and

(4) implementation and monitoring recommendations to ensure continued success towards reaching GHG reduction goals.

The CAP identifies strategies to guide the development and implementation of GHG reduction measures in the City of Carmel-by-the-Sea, and quantifies the emissions reductions that result from these strategies. The overall benefits of the CAP are much greater than reducing GHG emissions; it includes quality of life and resilience improvements for the community, potential energy cost savings for residents and businesses, and protection of environmental and community assets for future generations.

The CAP proposes strategies to reduce GHG emissions from community-wide activities and government operations. Strategies are broken down into six goals:
Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings
Goal 2: Improved Transportation Choices
Goal 3: Renewable Energy Sources
Goal 4: Water Efficiency
Goal 5: Waste Reduction
Goal 6: Urban Forest Protection and Heat Island Effect Reduction

GREENHOUSE GAS EMISSIONS INVENTORY AND FORECAST

GHG emissions inventories are the foundation of planning for future reductions. Establishing an inventory of emissions helps to identify and categorize the major sources of emissions produced over a single calendar year. A community inventory includes GHG emissions that result from the activities of city residents and businesses. The inventory identifies the major sources of GHG emissions resulting from activities in sectors that are specific to community activities.

Community GHG Inventory Scope

The Association of Monterey Bay Area Governments (AMBAG) has prepared community inventories for its member jurisdictions, including the City, for the years 2005, 2010, 2015, 2018, and 2019. The 2019 inventory is the most recent year for which data is available. Table A provides the sectors evaluated in the GHG inventories.

Table A: Community Sectors Evaluated

Community Sectors
Residential Energy (Electricity and Natural Gas)
Commercial Energy (Electricity and Natural Gas)
On-Road Transportation
Solid Waste
Wastewater

AMBAG calculated GHG emissions using the available activity data (e.g., kilowatt-hours of electricity) in the State Energy Efficiency Collaborative (SEEC) ClearPath tools to convert activity data to emissions output using relevant emission factors.

Transportation GHG Analysis

LSA Associates (LSA) was retained by the City to develop an updated GHG emissions inventory to address specific concerns associated with the City's unique tourist-based economy that attracts visitors from around the State and the world (Appendix A). The City wanted to better understand the relationship between its tourist economy and GHG emissions resulting from tourism. The City had two specific goals: (1) understanding GHG emissions from on-road transportation based upon the origins and destinations of vehicle trips attributable to the City; and (2) developing GHG reduction strategies that will be effective for different types of vehicle trips including vehicle trips resulting from tourism, vacation homes, employee commutes, delivery services, and other local trips.

The analysis determined the following vehicle trip information:

- Local trips made up approximately 7 percent (%) of all vehicle trips in the City and averaged 6.5 miles.
- Commute trips represented 38% of all vehicle trips in the City and averaged 27 miles per trip.
- Delivery services providing supplies to local businesses and construction sites in the City made up approximately 10% of all vehicle trips and averaged 27 miles.

- 20% of vehicle trips result from the occupants of second homes in Carmel with an average trip length of 120 miles from their origin to the second home.
- Domestic tourists (primarily from the Bay Area and Salinas) make up 22.5% of vehicle trips. Their mileage varies depending on their origin from 27 miles for visitors from Salinas to 322 miles for those from Los Angeles and Orange Counties.
- International tourists make up approximately 2.5% of vehicle trips. Many of these visitors took a tour bus to arrive in Carmel from San Francisco International Airport.

There are three types of GHG emissions that the United States Environmental Protection Agency (EPA) defines in their guidance protocols: Scope 1 GHG emissions are "direct" emissions from sources that are controlled by the jurisdiction; Scope 2 emissions are "indirect" emissions from sources controlled by the jurisdictions, such as emissions from the generation of electricity; Scope 3 emissions are from sources not controlled by the jurisdiction.

According to the EPA protocols, GHG emissions associated with vehicle miles traveled within Monterey County boundaries are considered "Scope 1" emissions and are counted in the City's GHG inventory and target setting. The GHG emissions associated with vehicle miles traveled outside of the Monterey County boundaries are considered Scope 3 emissions. Although these emissions are not included in the target setting, the City has developed strategies focused on reducing these emissions as well.

GHG Inventory Results

The City's total emissions in 2019 were 30,962 metric tons of carbon dioxide equivalent (MT CO_2e). As shown in Figure 1 and Table B, the on-road transportation sector was the largest contributor to emissions in the 2019 inventory, with 45.8% of the City's total GHG emissions. Natural gas from residential and commercial buildings made up 43.2% of the City's GHG emissions.

The third most significant category of emissions was solid waste at 10.3% of total emissions. Solid waste emissions are associated with the decomposition of organic waste material in landfills, which generates methane gas, a greenhouse gas 84 times more potent than carbon dioxide.

Electricity (0.5%), and wastewater (0.2%) comprised the remainder of the emissions. As shown in Figure 2, electricity accounts for a low percentage of total emissions due to the power supply mix provided by Central Coast Community Energy (3CE), which relies largely on low-carbon energy sources.

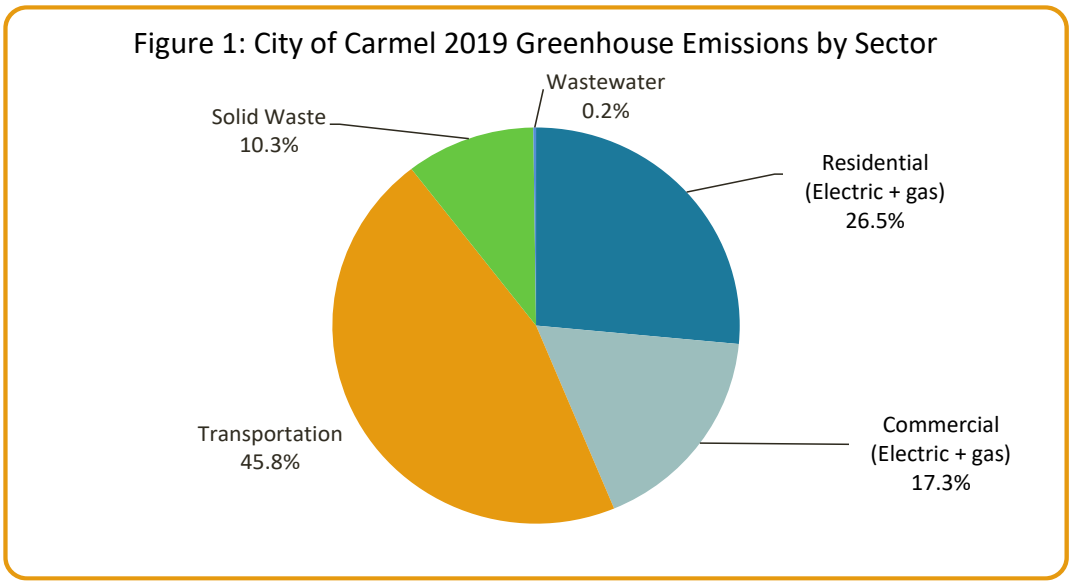
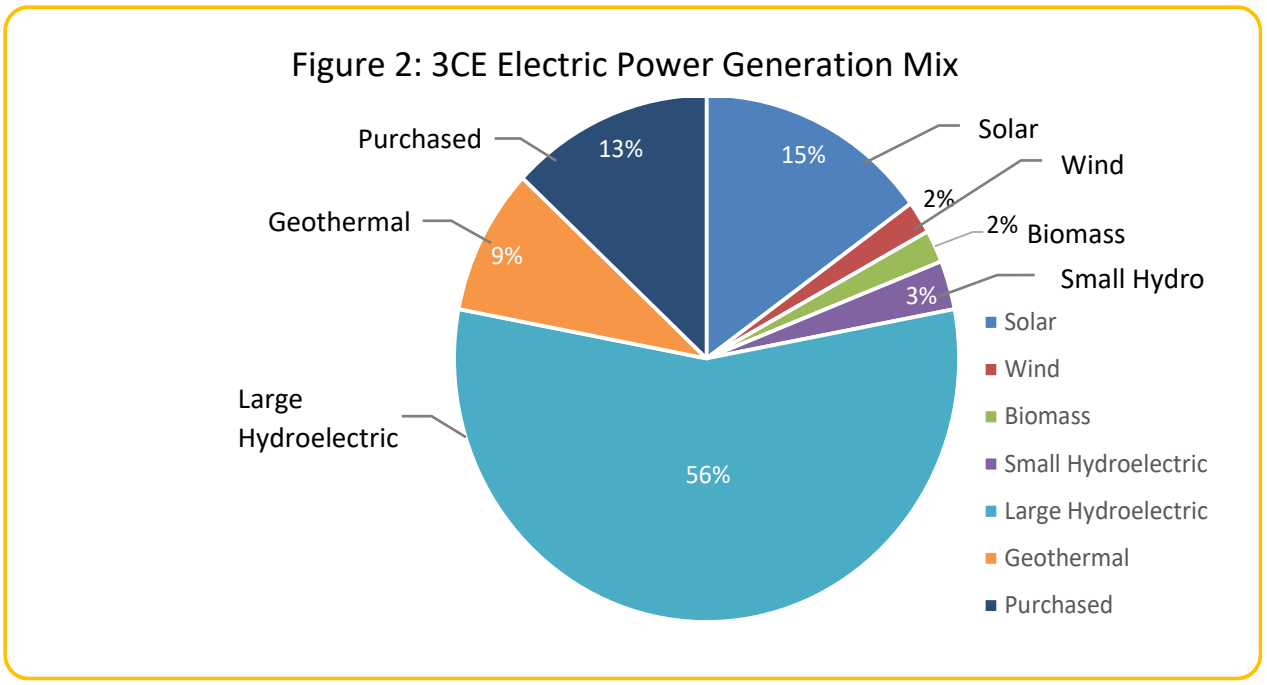


Table B: Communitywide GHG Emissions by Sector for 2019

Sector	2019 (MT CO_2e)	Percent of Total
On-road Transportation		
Scope 1	14,173	45.8
Scope 3	15,115	
Electricity		
Residential	63	0.5
Commercial	92	
Natural Gas		
Residential	8,138	43.2
Commercial	5,250	
Solid Waste	3,178	10.3
Wastewater	68	0.2
Total Scope 1 Emissions	**30,962**	100
Total with Scope 3 Emissions	**46,076**	

Source: AMBAG and LSA 2021.
MT CO_2e = metric tons of carbon dioxide equivalent



GHG Emissions Forecast

Forecasting future GHG emissions allows the City to understand how emissions are expected to increase or decrease in the future. Major changes in growth or land uses may affect how to best plan to reduce emissions in the future. GHG emissions are forecast using two scenarios: a Business-as-Usual (BAU) scenario and an Adjusted BAU (ABAU) scenario. The BAU scenario describes emissions based on projected growth in population and employment and does not consider policies that would reduce emissions in the future (that is, the policies and related efficiency levels in place in 2019 are assumed to remain constant through 2045). The City's projected growth is estimated using data from AMBAG's adopted growth forecasts for Carmel by-the-Sea, which provides the City's demographic growth indicators for the years 2030 and 2045. The growth rates for households, population, and employment were estimated based on the available data and used to estimate the growth in households, population, and employment into the year 2045. Table C shows the growth projections used to develop the emissions forecasts. As shown in this table, population, jobs, and energy consumption will experience very low growth rates in the City through 2045.

The ABAU scenario describes emissions based on projected growth *and* considers policies that will achieve GHG reductions in the future. By evaluating the two scenarios, the City can evaluate the effect that existing policies may have on future emissions and determine which local measures would provide additional reductions.

Two future years are forecast for each scenario: 2030 and 2045. The 2030 forecast year is consistent with the goals identified in the Senate Bill (SB) 32, and the corresponding Statewide Scoping Plan, which identifies Statewide GHG reduction targets for 2030.

As shown in Table D, the 2030 BAU emissions are estimated to be 29,445 $MTCO_2e$. By 2045, emissions are estimated to decrease to 27,471MT CO_2e. This modest reduction in GHG

emissions is due to changes over time as people purchase newer and more energy efficient automobiles and appliances.

As shown in Table E, the City's ABAU emissions are estimated to be 23,013 MT CO_2e in 2030, and 19,013 MT CO_2e in 2045. The ABAU takes into account stringent State regulations related to transportation (vehicle efficiency and low carbon fuel standards) and energy sectors (renewable energy portfolio standards and requirements for a portion of the natural gas supply to be renewable natural gas).

Table C: Growth Indicators for 2020, 2030, and 2045

Sector	Demographic Indicator	2020	2030	2020–2030 CAGR[1] Percent	2045	2020–2045 CAGR Percent
Residential Energy	Households	3,437	3,442	0.0002	3,459	0.0064
Commercial/Industrial Energy	Jobs	3,556	3,674	0.0033	3,915	0.0040
N/A[2]	Population	3,949	3,954	0.0001	3,984	0.0035
VMT, Solid Waste and Wastewater	Service Population (Population + Jobs)	7,505	7,628	0.0015	7,899	0.0020

Source: AMBAG, 2022 Regional Growth Forecast
[1] CAGR = Compound annual growth rate.
[2] Not applicable. Population data are shown for informational purposes but are not used for forecasting any sector.

Table D: Business As Usual (BAU) Forecast Emissions

Sector	2019 (MT CO_2e)	2030 (MT CO_2e)	Percent Change 2019–2030	2045 (MT CO_2e)	Percent Change 2019–2045
On-road Transportation			-5%		-11%
Scope 1:	14,173	13,316		12,582	
Scope 3:	15,115	14,201		13,418	
Electricity					
Residential	63	60	-5%	56	-11%
Commercial	92	87		82	
Natural Gas					
Residential	8,138	7,759	-4%	7,239	-11%
Commercial	5,250	4,961		4,628	
Solid Waste	3,178	3,033	4%	2,830	-11%
Wastewater	68	59	-5%	55	-12%
Total (Scope 1)	**30,962**	**29,445**	-5%	**27,471**	-11%
Total (Scope 3)	**46,076**	**43,646**		**40,889**	

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.
MT CO_2e = metric tons carbon dioxide equivalent

Table E: Adjusted Business As Usual (ABAU) Forecast Emissions

Sector	2019 (MT CO_2e)	2030 (MT CO_2e)	Percent Change (2019–2030)	2045 (MT CO_2e)	Percent Change (2019–2045)
On-road Transportation			-26.6%		-38.6%
Scope 1:	14,173	10,407		8,708	
Scope 3:	15,115	11,105		9,285	
Electricity					
Residential	63	47	-25.4%	39	-38.1%
Commercial	92	68		57	
Natural Gas					
Residential	8,138	6,138	-24.6%	5,010	-38.4%
Commercial	5,250	3,935		3,203	
Solid Waste	3,178	2,372	-25.4%	1,958	-38.3%
Wastewater	68	46	-32.4%	38	-44.1%
Total (Scope 1)	**30,962**	**23,013**	**-25.7%**	**19,013**	**-38.6%**
Total (Scope 3)	**46,076**	**34,118**		**28,298**	

Source: LSA forecasts for the City of Carmel by-the-Sea, 2021.
MT CO_2e = metric tons carbon dioxide equivalent

GREENHOUSE GAS EMISSIONS TARGETS

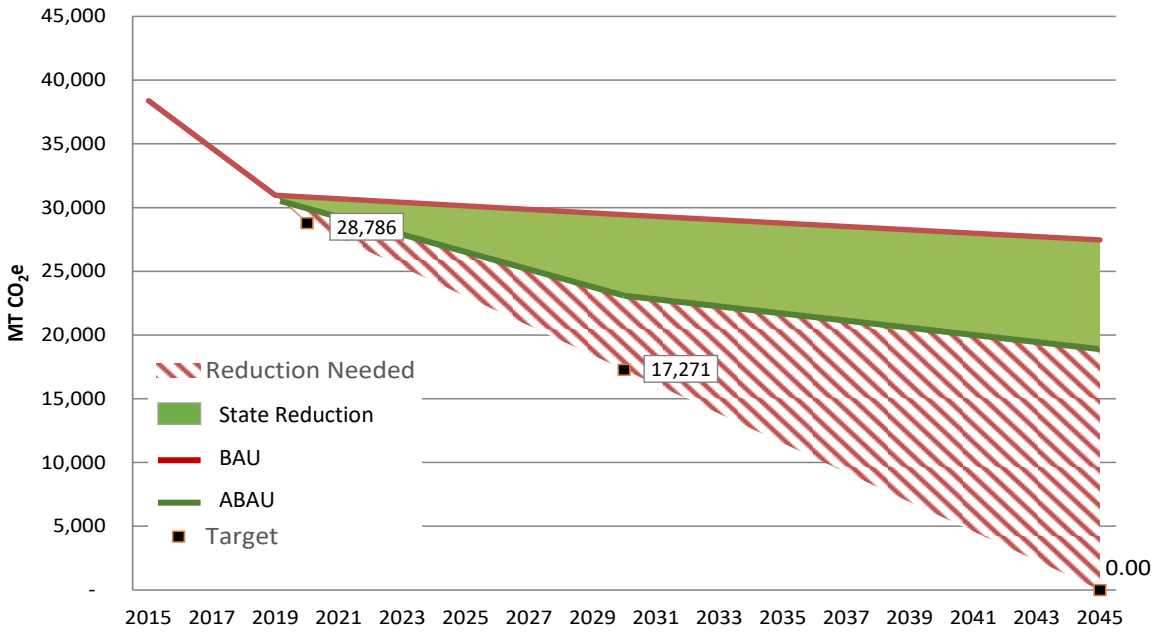
The State has set goals for reducing statewide GHG emissions by 2030 and 2045 through Assembly Bill (AB) 32, Senate Bill (SB) 32, SB 100, and Executive Order (EO)-B-55-18. The State has also provided guidance to local jurisdictions as "essential partners" in achieving the State's goals by identifying a 2030 GHG emissions target 40 percent below 1990 levels. Additionally, continued reduction goals should be implemented beyond the 2030 target to keep the State on a path toward Statewide climate neutrality by 2045.

In the City of Carmel-by-the-Sea, the State's target of 40 percent below 1990 levels by 2030 amounts to a reduction of 12,174 MT of CO_2 equivalent in annual emissions by 2030 compared to the BAU forecast and a reduction of 5,742 MT CO_2e by 2030 compared to the ABAU forecast to meet the State target. The City needs to implement strategies and measures to meet the State's 2030 GHG reduction target.

Additionally, the City's long-term goal is to also meet the State's 2045 carbon neutrality goal. As the City begins to implement the Climate Action Plan, additional measures will need to be identified and developed over time to meet this long-term goal.

Figure 3 depicts the BAU and ABAU forecasts, reduction targets, and additional GHG emission reductions required to meet the reduction targets.

Figure 3: BAU, ABAU forecasts, and Reduction Targets



GREENHOUSE GAS EMISSION REDUCTION STRATEGIES

Based on the City's GHG emissions forecasts and identified targets, the City developed a strategy table (Table F) of community-wide goals, measures, and actions to meet its 2030 reduction target and work towards its 2045 carbon neutrality goal.

In the strategy table, goals describe overarching objectives in a particular sector of GHG emission reductions. There are six goal areas listed in the table:

Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings
Goal 2: Improved Transportation Choices
Goal 3: Renewable Energy Sources
Goal 4: Water Efficiency
Goal 5: Waste Reduction
Goal 6: Urban Forest Protection and Heat Island Effect Reduction

Within each goal, one or more measures are presented. Each measure includes a GHG reduction potential by 2030 and one or more actions that indicate the steps the City plans to take in achieving the measure. Certain actions are noted as "supporting actions" that will enhance the effectiveness of program implementation and GHG reductions.

To facilitate implementation of each action by the City, additional information is included for each measure, as follows:

- **Metric:** A performance indicator to gauge progress on implementation of actions. Metrics are a key component of implementing, monitoring, and evaluating the Climate Action Plan.
- **Timeframe**: The timeframe lays out a preliminary timeline for action implementation.
- **Implementation Lead**: The City department(s) that will lead the implementation of each action.
- **Cost**: Sorted into ranges of $-Low (<$25,000), $$-Medium ($25,000 - $100,000), and $$$-High (>$100,000), these estimates are used to determine the extent of funding and financing needed to implement these measures.

TABLE F: GHG Emissions Reduction Strategy Table
Goal 1. Energy Efficiency and Electrification of Residential and Commercial Buildings

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 1.1 Energy Efficiency Training, Education, Incentives and Recognition for Residential and Commercial							
Action 1.1.1: Energy Efficiency Outreach Post links on website and social media and provide materials at public events re: energy efficiency and electrification resources for residential and commercial, and green building programs such as Leadership in Energy and Environmental Design (LEED), Passive House, Active House, and Energy Upgrade California Promote an annual energy efficiency fair. Promote PG&E energy center and online resources. Hold trainings on energy efficiency and Title 24 requirements.	Supporting Action	Supporting Action	- Energy efficiency resources on website, Friday Letter, social media - Energy efficiency fair held (Earth Day) - Title 24 training held	2022-2024	Building, Planning, Public Works, Community Activities	$	1.3.6
Action 1.1.2: Energy Efficiency and Electrification Incentives Partner with AMBAG, PG&E and 3CE to promote incentive programs for residential and commercial efficiency and electrification, including heat pump retrofits and gas appliance and fireplace retrofits.	71.1	71.1	- Incentive programs posted on website, Friday Letter, social media - Incentive programs promoted at energy fair - Incentive program promoted thru Green Business and Green Citizen programs	2023-2025	Building, Planning, Public Works	$	1.3.2, 1.3.6
Action 1.1.3: Energy Efficiency Audits Promote PG&E energy audits and tools for residential and commercial	Supporting Action	Supporting Action	- Audit Information on website, Friday Letter, social media - Information shared at annual fair	2022-2024	Planning, Public Works	$	

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 1.2 Energy Efficiency in Renovation Projects							
Action 1.2.1: Feasibility Study for Existing Building Electrification and Back-up Power. Perform an electrification feasibility study/existing building analysis in order to understand the potential for, and associated costs of, electrification retrofitting, including heat pumps, along with on-site energy generation, battery storage, and electric car readiness to provide a more resilient back-up power supply. Establish a plan for reducing or eliminating natural gas from existing buildings, through a reach code, and building resilience to potential electrical grid shutoffs.	Supporting Action	Supporting Action	- Feasibility Study for Existing Building Electrification and Back-up Power completed	2022-2024	Building, Planning, Public Works	$ $	1.3.4
Action 1.2.2: Residential Home Energy Renovations. Enhance enforcement of Title 24 compliance and promote participation in green building programs. Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require electrification retrofits, including electric car readiness, in major home renovations/additions. Evaluate feasibility of streamlining online permitting to facilitate electrification retrofits	1,217.5	1,294.6	- 100% of regulated projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair	2023-2025	Building, Planning	$ $	
Action 1.2.3: Residential Home Energy Renovation Incentives. Develop a program to promote home energy efficiency and electrification benefits, advertise incentives, and recognize residents that implement retrofits, such as a Green Citizen Program. Promote financing programs for home upgrades, such as Home Energy Renovation Opportunity (HERO) and Property Assessed Clean Energy (PACE) Promote incentives available to homeowners to convert to all-electric homes and install EV chargers. Evaluate the feasibility of providing additional incentives.	Supporting Action	Supporting Action	- Green Citizen Program developed - Financing information on website, at energy fair - Incentive information on website, at energy fair	2022-2024	Building, Planning, Public Works	$	1.3.6

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Action 1.2.4: Commercial Energy Renovations. Enhance enforcement of Title 24 compliance Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require electrification retrofits in major commercial renovations/expansions, unless the business can show a need for natural gas (restaurants, pottery kilns etc.) Promote participation in green building programs such as Leadership in Energy and Environmental Design (LEED), Passive House, and Energy Upgrade California. Evaluate the feasibility of streamlining online permitting to facilitate electrification retrofits	1,206.2	1,666	- 100% of regulated projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair	2023-2025	Building, Planning	$$	
Action 1.2.5: Commercial Energy Renovation Incentives. Partner with AMBAG and 3CE incentive programs to increase business participation in commercial energy efficiency programs Promote financing programs for home upgrades, such as Property Assessed Clean Energy (PACE) Initiate a Green Business Certification Program for businesses that follow the California Green Business Program standards (www.greenbusinessca.org). Promote existing incentives for businesses to convert to all-electric buildings. Evaluate the feasibility of providing additional incentives.	69.4	69.4	- Green Business Program initiated - Financing information on website, at energy fair - Incentive information on website, at energy fair, and shared via GBP	2022-2024	Building, Planning, Public Works	$	1.3.6

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 1.3 Energy Efficiency in New Construction Projects							
Action 1.3.1: Energy Efficiency in New Residential Construction Educate City staff and developers on future Title 24 updates. Promote CalGreenTier 1 and Tier 2 green building ratings such as Passive House, LEED, Build it Green or Energy Star certified buildings. Evaluate feasibility of streamlining online permitting. Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require new residential buildings to be all-electric homes.	0.01	0.01	- 100% of projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair	2023-2025	Building, Planning	$	
Action 1.3.2: Energy Efficiency in New Commercial Construction Educate City staff and developers on future Title 24 updates. Promote CalGreen Tier 1 and Tier 2 green building ratings such as Passive House, LEED, Build it Green or Energy Star certified buildings. Evaluate feasibility of streamlining online permitting. Develop a Reach Code based on the results of the Feasibility Study (Action 1.2.1). If feasible, the Reach Code should require new commercial buildings to be all-electric with exemptions for business that can show a need for natural gas (restaurants, pottery kilns etc.)	0.0	0.0	- 100% of projects are Title 24 compliant - Reach Code Adopted by City Council - Online permitting streamlined for electrification-only retrofits - Passive House, LEED, Build It Green, Energy Star information on City website and at energy fair	2023-2025	Building, Planning	$	

Goal 2. Improved Transportation Choices

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 2.1. Alternative Transportation Options							
Action 2.1.1: Reduce Reliance on Automobiles. Work with AMBAG, TAMC and Caltrans to remove barriers to alternative transportation such as safe pedestrian and bicycle access to the City across Highway 1. Promote and provide incentives for bus ridership Explore the feasibility of increasing land use density in downtown during the next General Plan Land Use Element update. Identify and promote within the hotels and visitors center existing shuttle services between Carmel and the airports. Work with Monterey Airport and AMBAG to explore the feasibility of an electric shuttle service between Monterey Airport and destinations in the City.	Scope 1 563 Scope 3 89	Scope 1 563 Scope 3 89	- Outreach on shuttle services created and provided in Carmel hotels - Incentives developed and promoted to encourage bus use - Coordination meetings held with AMBAG, Monterey Airport on shuttle options - Coordination meetings held re: alternative transportation to Carmel - General Plan Land Use Element updated	2023-2030	Planning, Public Works	$ $ $	
Action 2.1.2: Develop Bicycle Master Plan to Create Safe Bike Routes around the City Develop customized bike routes to improve bike transit. Provide signage, reduce speed limits as necessary, and develop safety education programs on “sharing the road” with bikes.	10	10	- Bicycle master plan created - Signage installed - Outreach materials created and shared via City website, newsletters, local newspapers, and other outlets.	2024-2026	Planning, Public Works	$	
Action 2.1.3: Ride-Sharing and Bike to Work Programs within City Operations and Businesses Promote ride-sharing and facilitate air district incentives for ride-sharing Provide reserved preferential parking spaces for ride-sharing, carpooling, and ultra-low or zero emission vehicles in City parking lots. Encourage the same at private businesses that have employee parking. Require businesses of a certain size to provide facilities such as bike racks and showers.	Supporting Action	Supporting Action	- Incentives for ride-sharing created and advertised - Incentives for bike riding created and advertised - Reserved parking spaces created for ride-sharing, and low/zero emission vehicles - Bike racks included in design guidelines for commercial remodels	2022-2024	Planning, Public Works	$	

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 2.2. Electrify the Fleet							
Action 2.2.1: Prioritize Electric Vehicles (EVs) Promote electric vehicle incentive programs at outreach events. Apply for grants to install e-chargers at public facilities. Work with community groups and businesses to install additional e-chargers. Encourage hotels to provide priority parking for electric vehicles and provide e-chargers. Provide priority parking for bus tours that use electric buses. Work with Visit Carmel to develop and initiate a Green Visitor Program that rewards tourists that use electric vehicles, carbon credits for air-miles, and that adhere to the City's sustainability practices while visiting the City. Require or incentivize major commercial building renovations/expansions to install e-chargers.	Scope 1 1,511 Scope 3 1,425	Scope 1 1,538 Scope 3 1,452	- EV incentives shared on City website, newsletters, and at energy fair - EV chargers installed at City parking lots - Electric bus parking created and associated outreach - Green Visitor Program established - Outreach at Visit Carmel re: EV chargers on hotel properties - EV chargers included in design guidelines for commercial remodels	2024-2026	Planning, Public Works, Community Activities	$ $ $	
Measure 2.3 Initiate Origin/Destination Transportation Model							
Action 2.3.1: Develop Model Develop an Origin Destination Transportation Model focused on Carmel-by-the-Sea using the AMBAG regional model as a base. Update the CAP with new VMT data once the Origin Destination Model is completed.	N/A	N/A	- ODTM Model developed - ODTM results incorporated in updated CAP	2024-2026	Planning, Public Works	$ $	

Goal 3. Renewable Energy Sources

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 3.1. Promote Clean Energy							
Action 3.1.1: Incentivize Clean Energy Installations Promote clean energy incentives to the community Incentivize solar panels installation on existing residential units Require or incentivize solar panel installation on major commercial building retrofits/expansions and commercial parking lots. Promote energy storage system installation with solar panels.	364	364	- Incentive information on website, at energy fair, and shared via new City outreach and recognition programs - Incentive for solar panel and/or energy storage installation developed	2024-2026	Building, Planning, Public Works	$ $	1.3.6
Action 3.1.2: Increase uptake of 3CE Renewable Generation portfolio Switch the City's electricity to 3CE's 100 Percent Renewable Energy Option Promote 3CE's 100 Percent Renewable Energy Option by encouraging residents and businesses to participate in the program.	-	-	- City electricity accounts switched to 3CE's 100% renewable option - 3CE 100% renewable energy option promoted at energy fair and via City outreach and recognition programs	2022-2024	Public Works, Planning	$ $	

Goal 4. Water Efficiency

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 4.1. Water Conservation in Landscaping							
Action 4.1.1: Continued Implementation and Promotion of City and Model Water Efficient Landscaping Ordinance Water Conservation Standards Increase promotion of landscaping water conservation standards on website and social media Ensure all projects comply with the City's low-irrigation landscaping requirements. Work with the Monterey Peninsula Water Management District (MPWMD) to promote incentives for existing landscaping retrofits to reduce water use.	2.9	3	- Landscaping water conservation information on website - 100% of projects including landscape retrofits comply with requirements - Landscape retrofit incentives developed and promoted in documents and outreach for development projects	2023-2025	Planning, Forestry, Public Works	$ $	3.1.7
Action 4.1.2: Exceed Water Efficiency Standards In partnership with the MPWMD, conduct direct outreach to HOAs, businesses, residents re: water conservation, grey water, rainwater harvesting Allow and promote recycled water for commercial and multi-family residential landscape irrigation. Allow and promote greywater systems and rainwater harvesting.	Supporting Action	Supporting Action	- Direct outreach to HOAs, businesses, residents thru outreach and recognition programs - Recycled water Standard Operating Guidance developed and promoted for commercial and multi-family construction projects - Grey water systems and rainwater harvesting information promoted in documentation for development projects	2024-2026	Building, Planning, Forestry	$	3.1.7

Goal 5. Waste Reduction

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 5.1. Reduce Waste that goes to the Landfill							
Action 5.1.1: Increase the City's solid waste diversion to reduce landfill methane emissions Promote zero waste events, including the use of reusable rather than recyclable materials, and buy local to reduce waste. Work with the Monterey Regional Waste Management District and the waste hauler to implement the requirements of SB 1383, including organic waste collection for all commercial and residential properties to process into compost. Conduct outreach to residents and businesses to ensure compliance and to minimize contamination. Promote home composting and community gardens. Educate the community on proper use of the City-provided grey/green/blue containers.	1500	1500	- Develop zero waste event checklist and require City events to abide by it. - SB 1383 requirements implemented and waste diversion tracked - Outreach to residents and businesses through mailers, newsletters, City website, hauler website, letters, direct outreach.	2022-2024	Public Works, Community Activities	$ $ $	

Goal 6. Urban Forest Protection and Heat Island Effect Reduction

Action	2030 GHG Reduction Achieved (MT CO2)		Metric	Timeframe	Implementation Lead	Cost	Corresponding Adaptation Measure
	No Enhancing	With Enhancing					
Measure 6.1. Urban Forest Maintenance for Shade and Energy Savings							
Action 6.1.1: Urban Forest Maintenance and Improvement Maintain the health of the urban forest tree canopy in the City to keep streets shaded and maintain cool surface and ambient air temperatures. Continue to work with the Friends of Carmel Forest and the community to facilitate urban forest maintenance. Update the City's Urban Forest Management Plan to include tree planting guidelines to promote tree health and maintain a healthy urban forest canopy.	-	-	- Urban Forest Management Plan Updated - Tree planting and maintenance guidelines updated - Number of replacement trees planted	2023-2025	Forestry, Public Works	$$	2.1.2
Measure 6.2. Light-reflecting Surfaces for Energy Savings							
Action 6.2.1: Allow Cool Roof Options Evaluate the feasibility of allowing cool roof options in residential and commercial areas of Carmel. If feasible, revise existing ordinances to allow cool roof options on residential, commercial and office buildings. Support the use of "Green Roofs" as an option for cool roofs with the use of drought-tolerant plants.	-	-	- Cool roof options researched and evaluated for consistency with Carmel design guidelines - Design Guidelines and/or ordinances revised	2024-2026	Planning	$	

Summary of GHG Emissions Reductions

By implementing the Statewide and local reduction measures described in Table F, the City would reduce its communitywide GHG emissions by 48 percent below 2019 levels of emissions by 2030. Table G below summarizes the strategies and the potential total GHG reductions for the community.

Figure 4 on the following page summarizes the 2015 through 2019 emission inventories, projected 2020, 2030, and 2045 emission forecasts, as well as the 2020, 2030, and 2045 reduction targets after implementation of the local reduction measures.

As shown in Figure 4, with implementation of the local reduction measures, emissions in 2030 are anticipated to be below the 2030 reduction target and provide additional reductions beyond 2030. However, even the proposed set of reduction strategies will not achieve carbon neutrality by 2045.

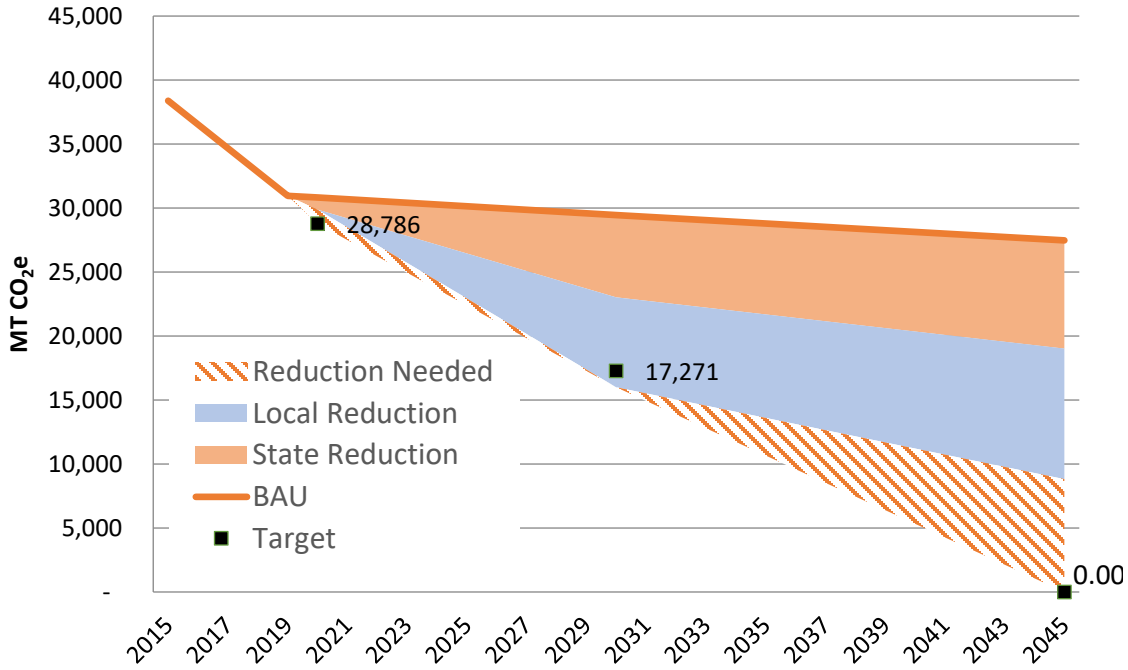
The City should track implementation of the Climate Action Plan over the next few years, update the 2045 ABAU forecasts, and provide local reduction strategy updates once the State has provided an updated Scoping Plan demonstrating how the State can achieve carbon neutrality by 2045.

Table G: Summary of Local GHG Reduction Strategies and Emissions Reductions

Goals and Measures	2030 Emission Reductions (MT CO_2e)
Goal 1: Energy Efficiency and Electrification of Residential and Commercial Buildings	
1.1: Energy Efficiency Training, Education, Incentives and Recognition for Residential and Commercial	71
1.2: Energy Efficiency in Renovation Projects	2,960
1.3: Energy Efficiency in New Construction Projects	0.01
Goal 2: Improved Transportation Choices	
2.1: Alternative Transportation Options	573
2.2: Electrify the Fleet	1,538
2.3: Initiate Origin-Destination Transportation Model	N/A
Goal 3: Renewable Energy Sources	
3.1: Promote Clean Energy	364
Goal 4: Water Efficiency	
4.1: Water Conservation in Landscaping	3
Goal 5: Waste Reduction	
5.1: Reduce Waste that Goes to the Landfill	1,500
Goal 6: Urban Forest Protection and Heat Island Effect Reduction	
6.1: Urban Forest Maintenance for Shade and Energy Efficiency	-
6.2: Light-reflecting Surfaces for Energy Savings	-
Total Community Measures	**7,009**

Source: Compiled by LSA 2022
MT CO_2e = metric tons of carbon dioxide equivalent
N/A = Not Applicable
- = Not quantified

Figure 4: Existing and Forecasted Emissions with Local Reduction Measure Implementation



IMPLEMENTATION

Implementation of the Climate Action Plan will require significant City staff time, consultants, and financial resources, along with collaboration with regulatory and utility partners to conduct community engagement. The successful implementation of the proposed actions will depend on the involvement of the whole community, including:

- City staff,
- Elected officials,
- Community group partners,
- Business community,
- Residents,
- Visitors.

This plan serves as a framework to strengthen the partnerships needed to meet the City's GHG reduction goals.

In addition to partnerships and community involvement, implementation of the Climate Action Plan will also require regular tracking and reporting to measure progress against the plan's goals. This section describes the guidance, tools, responsibilities, and analysis required to effectively implement and monitor progress with the adaptation strategy.

Strategies for Success

The strategies described below are recommended to ensure the successful implementation of this long-term multifaceted program:

- **Build on existing programs:** the Climate Action Plan focuses on building capacity based on existing programs and actions already in progress rather than "reinventing the wheel." There are many existing programs that the City can leverage, such as 3CE and PG&E incentive programs, LEED, and Energy Upgrade California, by ensuring businesses and residents have the knowledge and tools necessary to participate in them. Additionally, the CAP also builds on existing City policies and regulations that already provide GHG reduction benefits.
- **Leverage existing partnerships:** the CAP also prioritizes existing partnerships to leverage the expertise and resources that others, such as partner agencies and community groups, can bring to the table. This approach provides mutual benefits for the City and its partners.
- **Maintain communication:** it is essential to maintain communication within and between City departments, as well as with partners, elected bodies, and the community. A robust community outreach program, as well as regular updates to elected bodies, will be critical to the long-term success of the CAP.
- **Prioritize actions:** since the City and its partners cannot implement all the proposed measures and actions concurrently, each action has been prioritized for implementation over the next 10 years. Actions were prioritized in such a way that later actions could build on the outcomes of earlier actions. Early actions include those that can readily build on existing programs

and increase community awareness of necessary climate action measures to reduce the community's GHG emissions.

- **Regularly monitor implementation and evaluate success:** the Climate Action Plan will be monitored through tracking quantitative metrics, as described in the strategy table, to assess progress towards implementation of actions and measures. An annual report should be developed and should include an evaluation of the implemented actions and measures, assessing their effectiveness, and recommend modifications as needed. Elements that should also be considered in the evaluation include new regional and statewide programs and regulations, shifting community priorities, implementation hurdles, changes in best practice, and technological advances.
- **Seek guidance and leadership from elected bodies:** The City Council should consider establishing and appointing a new Sustainability Commission that could be responsible for reviewing the annual report, providing feedback on progress, and reviewing recommendations for enhancing the effectiveness of proposed measures. Based on feedback from the Sustainability Commission, City and partner staff, and the community, the City may conduct an update to the Climate Action Plan on or before 2030.
- **Funding:** although it is premature to estimate the overall cost of the CAP at this time, implementation will require significant staff time and capital investment. The City will ultimately need to develop a funding plan to implement the more costly actions in the Climate Action strategy. The City should consider a variety of revenue sources, including:
(1) adjusting existing fees to cover the costs associated with new or modified programs and services,
(2) allocating portions of new fees, such as a downtown parking fee, to fund sustainability projects and programs,
(3) exploring regional and state funding sources such as 3CE, the California Public Utilities Commission's California Solar Initiative, California Energy Commission and PG&E energy efficiency programs, the California Climate Action Corps Fellowship Program, CalRecycle grants and loans, and other similar programs.

Monitoring and Evaluation

The City should designate one department as the lead for carrying out implementation monitoring and evaluation of climate action. Although some GHG reduction measures and actions can be implemented using existing staff time, full implementation and coordination of efforts will require additional staff resources. For example, the City's Grant Writer/Climate Coordinator that is identified in the Climate Adaptation Plan could be tasked with carrying out implementation coordination, monitoring and evaluation of the CAP. The Grant Writer/Climate Coordinator could also lead the compilation of all monitoring data and an overall assessment of effectiveness annually.

Re-evaluation of GHG emissions reduction strategies should occur when new information indicates that a measure or action is either infeasible or ineffective. The CAP should be

monitored through tracking quantitative metrics as described in the strategy table (Table F). The CAP should be monitored and evaluated simultaneously with the City's Climate Adaptation Plan to measure the City's overall progress towards acting on climate change and increasing community sustainability and resilience.

Annually, the City should aggregate monitoring and evaluation results into an annual report describing achievements towards meeting the GHG reduction goals and measures in the Climate Action Plan. The report should be posted on the City's website and disseminated into the community, with support from engagement partners, to maintain awareness of success of the climate action strategies. Once implementation has been on-going for a few years and based on monitoring and evaluation results, as well as feedback from commissions, the City Council, and the public, the Climate Action Plan should be updated on or before 2030. As part of the Climate Action Plan update, the City should re-evaluate the ABAU forecast based on the latest State Scoping Plan, and should update its GHG emissions reduction strategy to reach Carbon Neutrality in 2045.

APPENDIX A