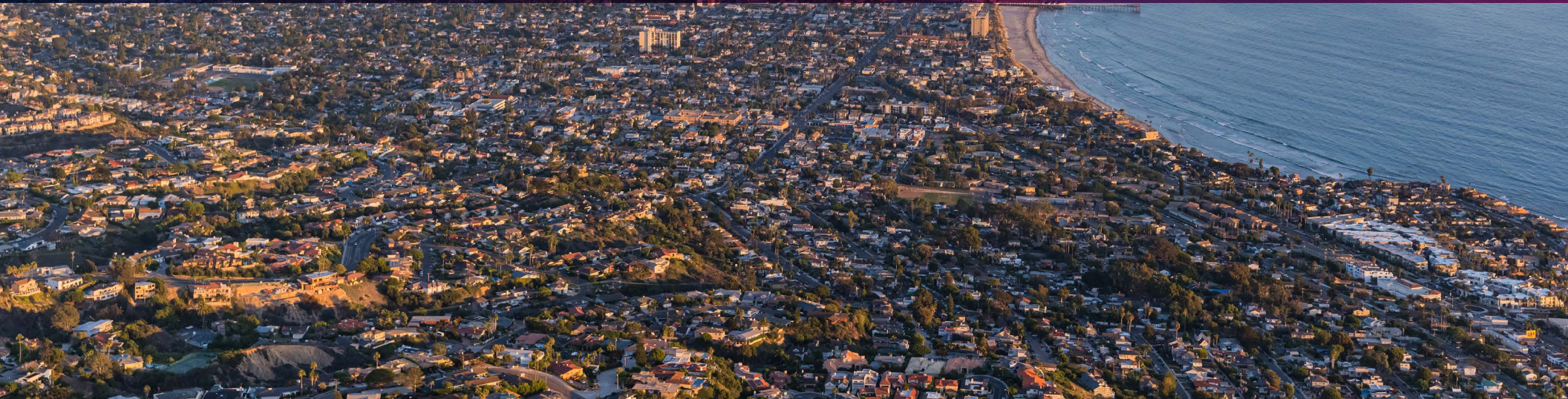




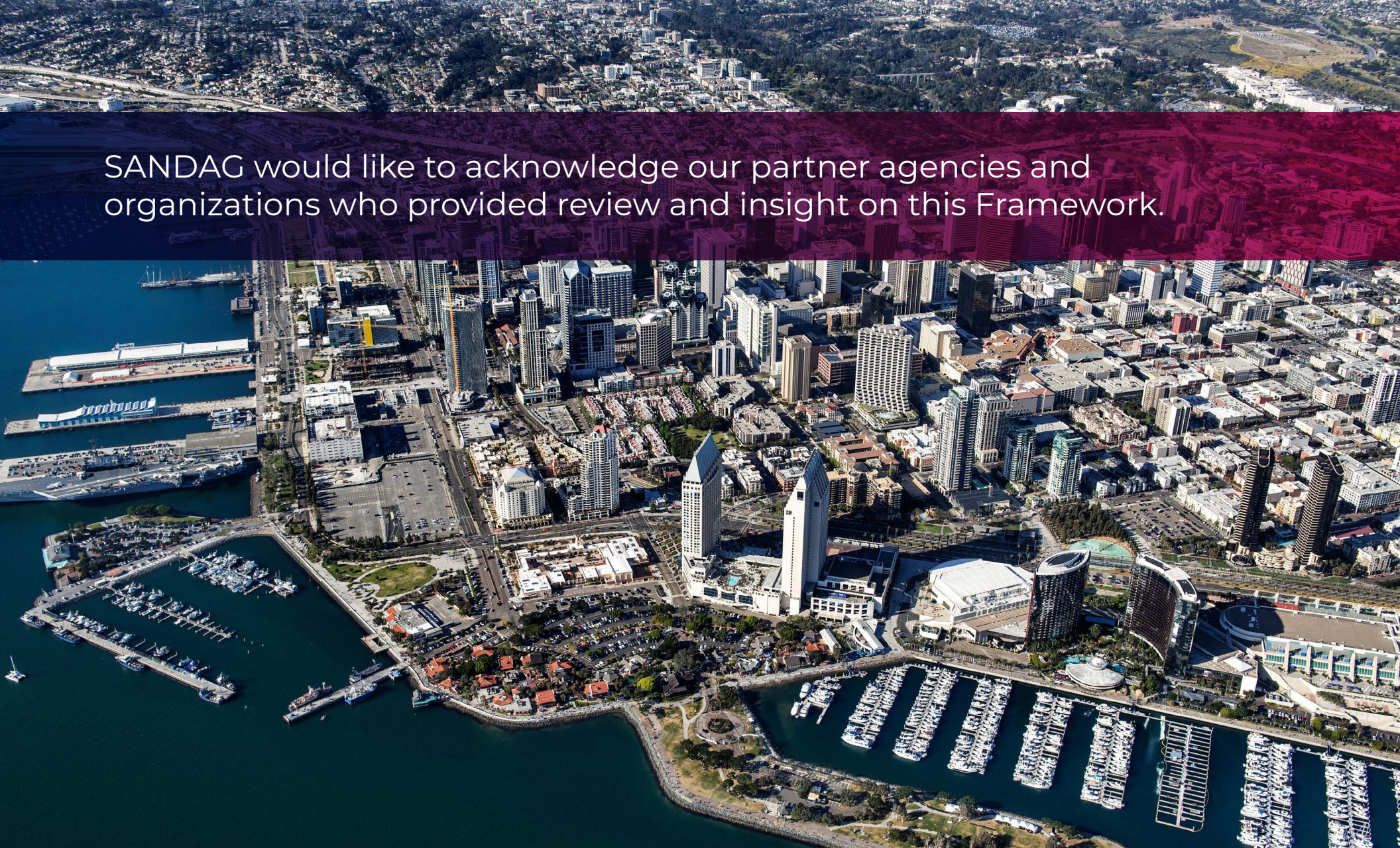
Regional Resilience Framework



DECEMBER 2023

Funding for this project was provided by a grant funded through Senate Bill 1, the Road Repair and Accountability Act of 2017, Caltrans Formula Funds Work Element 320170 and 3201701.



An aerial photograph of San Diego, California, showing the city skyline, harbor, and surrounding areas. The image is split horizontally. The top half shows a dense urban area with many buildings and a large stadium in the distance. The bottom half shows a harbor with many boats and a large stadium. A dark red banner with white text is overlaid across the middle of the image.

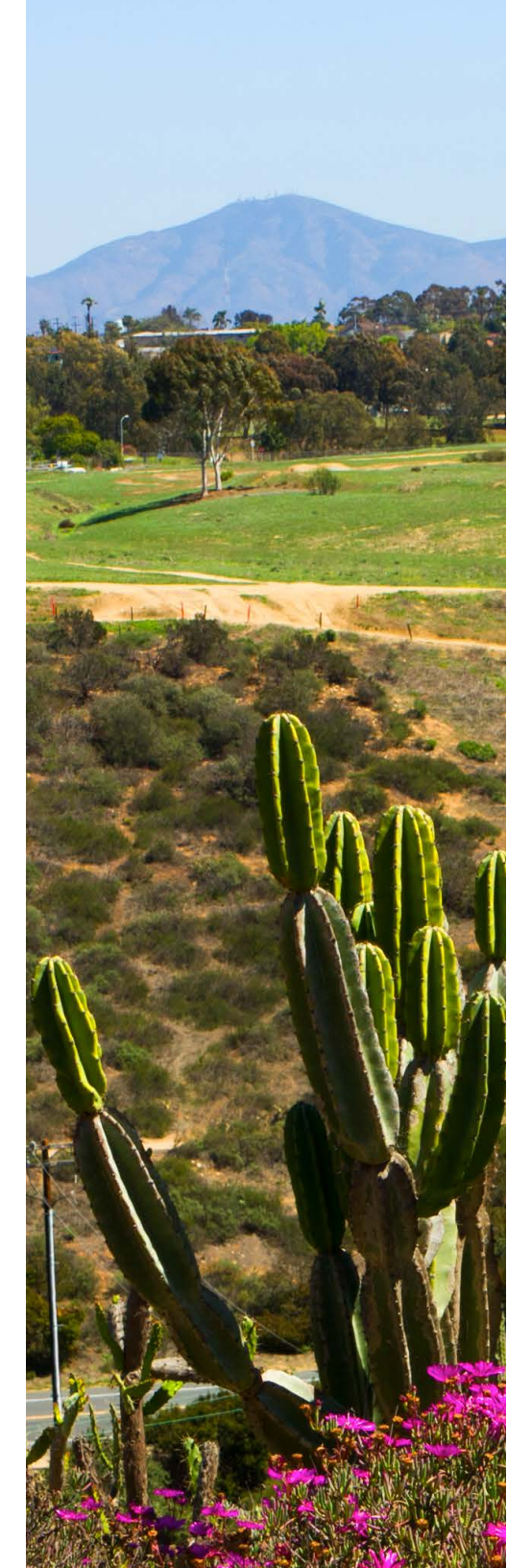
SANDAG would like to acknowledge our partner agencies and organizations who provided review and insight on this Framework.

2 Regional Resilience Framework

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GLOSSARY OF ACRONYMS AND DEFINITIONS

APG: Adaptation Planning Guide

CAP: Climate Action Plan

DAC: Disadvantaged Community

CEQA: California Environmental Quality Act

GHG: Greenhouse Gas

HIATRS: Holistic Implementation of Adaptation and Transportation Resilience Strategies

LCP: Local Coastal Plan

MJHMP: Multi-Jurisdictional Hazard Mitigation Plan

MTS: San Diego Metropolitan Transit System

NCTD: North County Transit District

OPR: Office of Planning and Research

ReCAP: Regional Climate Action Planning

SANDAG: San Diego Association of Governments

SCAG: Southern California Association of Governments

ABAG: Association of Bay Area Governments

Adaptive Capacity: The ability to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

Area of High Heat Risk: Census tracts in which the heat health action index score is in the top quartile of the county.

Climate Equity: The goal of addressing the impacts of climate change, which are felt unequally, by identifying who is most impacted and taking action to limit its effects.

Climate Change Adaptation: The adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, and which moderates harm or exploits beneficial opportunities.

Community of Concern: Historically underserved and underrepresented communities. This definition overlaps with that of disadvantaged communities.

Disadvantaged Community: Places that meet one or more of the following criteria: (1) census tracts with the highest 25% overall scores in CalEnviroScreen, (2) census tracts without an overall score due to data gaps that show the highest 5% of cumulative pollution burden scores,

(3) census tracts identified as disadvantaged in the 2017 DAC designation, or (4) lands under control of federal recognized Tribes, which may establish an area of land not represented on California Environmental Protection Agency’s (CalEPA) DAC map through consultation with CalEPA.¹

Monitoring: The regular and ongoing tracking of the status or condition of a program, project, policy or strategy to measure progress or change over time.

Resilience: The capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt to grow from a disruptive experience.

Vulnerability: Degree to which natural, built, and human systems are at risk of exposure to climate change impacts. Differences in exposure, sensitivity, and adaptative capacity affect an individual’s or community’s vulnerability to climate change.²

¹ California Office of Environmental Health Hazard Assessment (OEHHA). “SB535 Disadvantaged Communities.” Accessed September 12, 2023: <https://oehha.ca.gov/calenviroscreen/sb535>

² This definition is adapted from the Planner’s Dictionary (American Planning Association) and the California Adaptation Planning Guide (APG).



EXECUTIVE SUMMARY

The Regional Resilience Framework (Framework) provides San Diego Association of Governments (SANDAG) member agencies guidance to build resilience to climate change hazards in the region. SANDAG’s member agencies are encouraged to use the Framework to plan and prepare for the impacts of sea-level rise, extreme heat, increasingly frequent and damaging wildfires, more frequent and severe rain events, and other climate-related issues.

The Framework includes the following components:

SAN DIEGO REGIONAL ADAPTATION PLANNING GUIDE

The 2020 California Adaptation Planning Guide 2.0 (APG) sets forth a detailed, four-phase process to guide local governments, regional planning agencies, and tribal governments in the development and integration of climate adaptation and resilience components of stand-alone Climate Action Plans and/or Climate Adaptation Plans, Hazard Mitigation Plan updates, and General Plan updates consistent with state statutes. At the beginning of the Framework project planning process, member agencies were surveyed and interviewed about their progress in adaptation planning and where they felt they were in the four-phase process. It was found that, as a result of the overlapping and numerous plans that

can include adaptation, most jurisdictions did not find themselves in one phase, but many phases, depending on the hazard. Hazards such as sea-level rise and wildfire have been at the forefront of planning in the region for many years, and therefore jurisdictions are often in later stages in addressing those hazards but are not as far along with emerging topics such as extreme heat.

This guides the reader through each phase of the adaptation guidance and provides state and local resources for each phase. It begins with a “Start Here” guide that includes considerations per hazard to decide if this is the correct phase to begin, or if it has already been addressed. If addressed, the reader moves to the next phase. These assessments can be repeated over time as plans are adopted, implemented, and updated.

ADAPTATION PLANNING TOOLS

As part of the Framework project, with input from regional stakeholders, the following three new local tools were prepared along with a guidebook for how to use the tools:

Regional Resilience Framework Tools Guidebook

The Framework Tools Guidebook provides guidance on how to use each of the Framework Tools: Adaptation Pathways, Adaptation Metrics, and Adaptation Checklist. The guidebook outlines the purpose of each tool and when each tool should be used. The guidebook provides

additional context and definitions to assist the users of the tools to integrate them into their planning practice.

Adaptation Pathways

The Adaptation Pathways tool utilizes observable conditions to represent a point in time when action must be taken to address hazard-related vulnerabilities (i.e., a trigger point). An appropriate trigger point provides enough notice and lead time to plan for and implement an adaptation strategy before vulnerabilities become severe. The Adaptation Pathways tool is an Excel Sheet where planners can input their existing adaptation strategies, categorize them, and link them to create adaptation pathways.

Adaptation Metrics

The Metrics Worksheet is used to help define success in implementing adaptation strategies. This worksheet creates a common language across implementing departments so that stakeholders understand their progress. Planners would use the worksheet, to define the category of implementation along with the relevant hazards, priority communities, applicable equity considerations, and the implementing party. These definitions will assist the planners in creating target metrics, funding, and lead time. For each Implementation category (e.g. Capital Improvement, Development Standard, etc.) include sample metrics. The terms used in the metrics are consistent with the Adaptation

Pathways so that they can be used in tandem if desired. It is recommended that local agencies include metric development in project request for proposals and project workplans as a final stage when feasible, otherwise the metric worksheet can be used by local agency staff after a plan is adopted.

Adaptation Checklist

The Project Checklist is a tool jurisdictions can use to evaluate infrastructure improvements, and other physical projects, resilience to climate change impacts based on the expected lifespan of the infrastructure, projected hazards, and community vulnerabilities. The Project Checklist then presents adaptation measures to ensure infrastructure improvements are designed to be resilient to conditions intensified by climate change, including the potential for hazards of extreme heat, wildfire, inland flooding, and coastal flooding/sea level rise.

Existing Conditions Report

The Existing Conditions Report summarizes the current status of climate adaptation and resilience planning among jurisdictions in the San Diego region and identifies the tools and resources local jurisdictions need to advance this work. To assess existing conditions, the project team conducted a survey, met with stakeholders, and performed a document review of a variety of adaptation and resilience plans. The team evaluated the general depth and detail of all this information in context of the four phases outlined in the California Adaptation Planning Guide (APG). The Existing Conditions Report can be found in Appendix B.

INTRODUCTION

To prepare and adapt to the challenges from climate change, the San Diego region must adjust how it responds to the impacts of climate change today to become more resilient to future impacts. The San Diego Association of Governments (SANDAG) is working with local governments and regional stakeholders so communities, local and regional economies, and natural resources and recreational spaces can endure, recover, and thrive in response to the impacts of ongoing climate change. SANDAG is committed to helping the region continue to meet its climate goals so that all residents can enjoy a safe and sustainable future. Adaptation and resilience planning is critical for communities to address the assessed climate vulnerabilities and to implement resilience strategies to prepare for future conditions and impacts before they happen.

Several efforts have already been completed by SANDAG to further regional adaptation planning and implementation, including the 2020 Regional Adaptation Needs Assessment, which identified planning needs and opportunities, and advanced coordination across adaptation projects throughout the region. Staff also completed the Holistic Implementation of Adaptation and Transportation Resilience Strategies (HIATRS) project in 2021 to support local jurisdictions transitioning from planning to implementing their climate change mitigation

and adaptation work. Three resources were created as a part of the HIATRS project to assist local planning staff, practitioners, and decision-makers as they identify and implement climate adaptation strategies, including a Prioritization Tool and Guidebook, an Equity-First Approach to Climate Adaptation Guidance tool, and an Economic Guidance for Climate Adaptation Guide.

The Regional Resilience Framework (Framework) for the San Diego region builds off past adaptation work and provides an overarching strategy for building resilience to climate change and hazards in the San Diego region. The Framework provides a home for the San Diego Association of Governments’ (SANDAG’s) resilience guidance. SANDAG’s member agencies will be able to use the Framework to plan and prepare for the impacts of sea level rise, extreme heat, increasingly frequent and damaging wildfires, more frequent and severe rain events, and other climate related issues by consistently updating plans and planning processes consistent with regional best practices.

OUR APPROACH

A resilience framework specific to the San Diego region will serve as a key resource to help planning practitioners address climate adaptation planning, implementation, and funding needs for the region. This Framework recognizes that much of the work will happen at the local level, however climate disasters are happening at a

regional scale. A holistic process and methodology across multiple local jurisdictions can result in safer communities that are more resilient to future disasters.

To better understand current adaptation and resilience planning efforts and regional needs, the project team reviewed all relevant local and state documents, as well as conducted outreach to regional stakeholders, which includes local planning and sustainability staff, to identify and gauge where additional help and resources are needed. Local jurisdictions were surveyed in Fall 2022 to determine where each jurisdiction was in the adaptation planning process, based on the four-phase approach in the California Adaptation Planning Guide. These four phases include: Phase 1 explore and define adaptation; Phase 2, assess vulnerabilities; Phase 3, define adaptation and strategies; and Phase 4, implement and evaluate. Generally, jurisdictions are excelling in Phases 1, and 3 and could use support in Phases 2 and 4. While many jurisdictions have completed Phase 2, many plans are missing information about sensitive populations, critical assets, and current capacity. Additionally, many jurisdictions have not yet reached Phase 4. It is important to note that jurisdictions voiced that they felt further ahead in certain hazards, such as sea level rise or other existing hazards, and adaptation planning was inherently piecemeal. More information and detail on regional findings for each phase begins on page 21.

Using input gained early in the process from local planning and sustainability staff, three draft tools were prepared to provide resources for local jurisdictions for their adaptation planning efforts. A meeting was held with these stakeholder in July 2023 to present the draft tools. The team shared information on the purpose of each tool, how it will help in adaptation planning, and demonstrated how each tool would be used. Feedback received from these stakeholders at this meeting was used to refine the tools to make them more useful to local jurisdictions. The final tools were presented to stakeholders at a final meeting in September 2023.

The Framework will join other regional toolkits helping local governments prepare for climate change including the Southern California Association of Governments Adaptation Planning Guide, the Association of Bay Area Governments Regional Resilience Toolkit, and the Riverside Council of Government Resilient IE Toolkit. The Framework aims to supplement these frameworks, so that local jurisdictions can utilize existing resources and augment them with San Diego specific adaptation tools. Further information on these resources can be found in Appendix C.



Status of Adaption Planning



STATUS OF ADAPTATION PLANNING

Climate adaptation planning can live in many different planning documents, including a General Plan, Climate Action Plan, Climate Adaptation Plan, and Local Coastal Program. Descriptions of these plans, including any applicable legal requirements and how they can further adaptation planning, are provided below and include accountings of each document type in the San Diego region. The status of each type of plan reflects local government survey results and research conducted during this project. This section closes with a summary table **(Table 1)** that provides the status of each type of planning document for all member agencies as of November 2022.

GENERAL PLAN SAFETY ELEMENT

What is it?
All cities and counties in California must have a General Plan. The General Plan is a blueprint for the future of the community and often has a 20-year planning horizon. Government Code Section 65302 requires every General Plan to include seven elements, including a Safety Element. The Safety Element of a General Plan is a high-level document that identifies and examines current local hazards and then provides policy to make the

community less vulnerable to these threats. These hazards may include flooding, earthquakes, landslides, tsunamis, wildfires, hazardous waste, and more.

What are the legal requirements?
SB 379 requires Safety Elements to consider how climate change will affect the forecasted effects of natural disasters.³ SB 379 mandates that local jurisdictions must update their safety elements to discuss climate change adaptation by January 1, 2022. The Office of Planning and Research (OPR) recommends the Safety Element be updated regularly to ensure the climate change section is up to date with current data and analysis; however, there are no specific requirements. Furthermore, OPR suggests updating concurrently with the Housing Element, every 5-8 years.

How does it connect to other plans?
The Safety Element is strongly correlated to the San Diego Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) and provides a policy framework and background report to implement the emergency management and mitigation measures found in the MJHMP. The Safety Element more generally addresses risk to human life, property damage, and economic and social dislocation through land use policy over a longer time frame, while the MJHMP focuses on specific hazardous events and proposes direct mitigation and response strategies. The Housing Element helps to guide where, and what type of, housing will

3 Jackson. 2015. Senate Bill No. 379. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB379.

develop within a given jurisdiction. As the Land Use and Housing Elements are updated to reflect future growth of new neighborhoods, it is essential the Safety Element reflects the risks to new developments.

Status of climate resilience in Safety Elements
As of November 2022, 71% of jurisdictions in the SANDAG region have Safety Elements or are in the process of updating their Safety Element to include climate resilience.

GENERAL PLAN ENVIRONMENTAL JUSTICE ELEMENT

What is it?
The Environmental Justice Element addresses the public health and safety needs of disadvantaged communities. These plans discuss community conditions such as access to healthy food, local pollution exposure, and other environmental burdens including the effects of climate change and related hazards.

What are the legal requirements?
The Environmental Justice Element is a State requirement created through SB 1000. Only jurisdictions that contain disadvantaged communities, or neighborhoods in census tracts that score in the top 25% in the community

4 California OPR. 2020. General Plan Guidelines, Chapter 4.8: Environmental Justice Element.
5 California OPR 2020.

conditions discussed above, as compared to census tracts throughout the rest of the State, need to address environmental justice.⁴ A jurisdiction must write an Environmental Justice Element when, two or more General Plan elements are updated at the same time. In practice, these updates have been commonly adopted concurrently with Housing and Safety Element updates.

How does it connect to other plans?
OPR recognizes that disadvantaged communities are often most vulnerable to the effects of climate change. For this reason, the Environmental Justice and Safety Elements coordinate to protect the disadvantaged and vulnerable communities from climate change related hazards.⁵

Status of climate resilience in Environmental Justice Elements
As of November 2022, 43% of jurisdictions in the SANDAG region have Environmental Justice Elements that include climate resilience or are in the process of updating their Environmental Justice Element.

CLIMATE ACTION PLAN

What is it?

A Climate Action Plan (CAP) is a document that inventories and strategizes reduction of greenhouse gas emissions overtime through programs and policies.

What are the legal requirements?

CAPs are not required by the State of California; however, they are meant to help local governments meet California’s greenhouse gas (GHG) mitigation goals and are often used to encourage California Environmental Quality Act (CEQA) streamlining.⁶ For example, SB 97 mandates that the CEQA consider GHG impacts of a proposed project in CEQA analysis.⁷ If a jurisdiction creates a CAP that plans for projected cumulative GHG impacts, then proposed projects under CEQA may be granted streamlining approval so long as the impacts are accounted for and consistent with the cumulative impact analysis in the CAP.⁸

How does it connect to other plans?

The CAP is directly aimed at addressing the causes of climate change. While the policies to reduce GHG emissions may not directly address adaptation, CAPs are

inherently connected to any climate related policy. In many cases, the CAP will also contain climate adaptation measures.

Status of climate resilience in Climate Action Plans

As of November 2022, 93% of jurisdictions in the SANDAG region have either a climate action or adaptation plan that include climate resilience.

CLIMATE ADAPTATION PLAN

What is it?

A Climate Adaptation Plan is created to strategize how a jurisdiction will protect its property, maintain its community identity, and secure its quality of life over time as climate change related hazards have increased in frequency and severity. The plan discusses programs and policies to help the jurisdiction adapt to an inevitably new environment.

What are the legal requirements?

Standalone climate adaptation plans are not required by law. Local governments may choose to adopt them to create a comprehensive plan that informs the General Plan, Local Coastal Plan, and MJHMP.⁹

6 Boswell, M., and Jacobson, M. 2019. 2019 Report on the State of Climate Action Plans in California. San Luis Obispo: California Polytechnic State University, City and Regional Planning Department.
7 California OPR. 2008. Addressing Climate Change Through California Environmental Quality Act (CEQA) Review: Technical Advisory.
8 Title 14 CCR 15183.5
9 California OES. 2020. California Adaptation Planning Guide.

How does it connect to other plans?

The principal purpose of adaptation planning is to prepare for natural disasters and environmental harms, including extreme heat, sea level rise, and others that are influenced by climate change.

Status of climate resilience in Climate Adaptation Plans

As of November 2022, 16% of jurisdictions in the SANDAG region have a standalone plan and an additional 47% include adaptation in a similar plan.

LOCAL COASTAL PROGRAM

What is it?

The Local Coastal Program (LCP) establishes land use, natural resource protection, coastal access, and public recreation policies within the coastal zone as determined by the California Coastal Commission. The LCP sets specific development guidelines to ensure coastal environmental protection, public access to the coast, and to limit development within areas of high risk from hazards such as sea level rise. Only jurisdictions with land within the coastal zone have the option to write an LCP.

What are the legal requirements?

The California Coastal Act is the primary legal driver of LCPs. The California Coastal Commission plans and regulates the use of land and water in the coastal zone.

10 California NRA. 2013. Local Coastal Program Update Guide.

Development activities, which are broadly defined by the Coastal Act to include construction of buildings, divisions of land, and activities that change public access to coastal waters, generally require a coastal permit from the Coastal Commission. If a jurisdiction has a certified Local Coastal Program in compliance with the Coastal Act, coastal development projects experience a more predictable and streamlined approval process. After an LCP has been certified, the Coastal Commission’s coastal permitting authority over most new development is transferred to the local government, which applies the requirements of the LCP in reviewing proposed new developments.¹⁰

CERTIFIED LOCAL COASTAL PROGRAM

A jurisdiction that wishes to process its own coastal permits within its designated coastal zone must create and adopt an LCP. After adoption, the LCP is sent to the California Coastal Commission to be reviewed. If the Commission finds compliance with the Coastal Act, it will certify the LCP and allow the jurisdiction to process most coastal development project applications according to the provisions set forth in the Coastal Act.

How does it connect to other plans?

The LCP takes into account climate change related coastal hazards as they relate to existing land uses and planned development such as sea level rise, tsunamis, coastal flooding, storm waves, landslides, and coastal bluff erosion. While LCPs are only applicable in the coastal zone, they parallel Safety Elements and other General Plan components by regulating land uses.

Status of climate resilience in Local Coastal Programs

As of November 2022, 50% of jurisdictions that have an LCP in the SANDAG region include climate resilience.

Table 1. Current Status of Plans with Adaptation Language by Jurisdiction as of November 2022

JURISDICTION NAME	SAFETY ELEMENT	ENVIRONMENTAL JUSTICE ELEMENT	CLIMATE ACTION PLAN	CLIMATE ADAPTATION PLAN	LOCAL COASTAL PLAN
Carlsbad	Yes	Not required	Yes	In another similar plan	Yes
Chula Vista	Yes	No	Yes	Yes	No
Coronado	No	Not required	Currently updating	Currently updating	Currently updating
Del Mar	Currently updating	Currently updating	Yes	In another similar plan	Yes
El Cajon	Yes	Yes	Yes	No	Does not apply
Encinitas	Currently updating	Not required	Yes	In another similar plan	Yes
Escondido	Yes	Currently updating	Yes	In another similar plan	Does not apply
Imperial Beach	Currently updating	Currently updating	Yes	In another similar plan	Currently updating
La Mesa	Yes	No	Yes	No	Does not apply
Lemon Grove	No	No	Yes	In another similar plan	Does not apply
National City	Currently updating	Currently updating	Yes	Currently updating	No
Oceanside	Currently updating	Currently updating	Yes	No	Currently updating
Poway	Currently updating	Not required	No	No	Does no apply
San Diego	Yes	Currently updating	Yes	Yes	Included in Community Plan
San Marcos	Currently updating	Currently updating	Yes	No	Does not apply
Santee	Currently updating	Currently updating	Yes	In another similar plan	Does not apply
Solana Beach	Currently updating	Currently updating	Yes	In another similar plan	Yes
Vista	No	Not required	Yes	In another similar plan	Does not apply
County of San Diego	Yes	Yes	Currently updating	Yes	No

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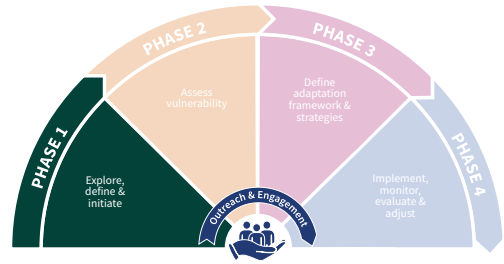
Adaptation Planning Guide



ADAPTATION PLANNING GUIDE

The 2020 California Adaptation Planning Guide 2.0 (APG) sets forth a detailed, four-phase guideline to writing and implementing a successful climate adaptation planning process. This section outlines these phases to provide an assessment to determine the scope and completeness of each phase and subphases. This should help guide local jurisdictions through the remaining Framework resources and support future adaptation planning. These assessments can be repeated over time as plans are adopted, implemented, and updated. This section closes with overarching findings that inform the development of the Framework tools.





PHASE 1

Adaption Planning Guide:

Explore, Define and Initiate

Start here if:

Extreme Heat: General Plan does NOT address SB 379 or SB 1000 (as applicable).

Wildfire: General Plan does NOT address SB 379, SB 99, Assembly Bill 1409, or SB 1000 (as applicable).

Inland Flooding: General Plan does NOT address SB 379 or SB 1000 (as applicable).

Sea-Level Rise: LCP has not been updated to include sea-level rise.

STEPS

- 1.1 Motivation and Scope
- 1.2 Teams and Resoures
- 1.3 Climate Effects and Community Elements
- 1.4 Outreach and Enagement

CONFIRM THE PLANNING PROCESS, PURPOSE, AND OUTCOMES

When starting to create an adaptation plan, a local government should understand the legal requirements and community concerns they are trying to address. Outcomes will vary by plan and should be compared to the legal requirements outlined above.

DEFINE VISION AND KEY TERMS

All plans should define the following terms if they are used:

- Adaptation
- Resilience
- Hazard mitigation
- Preparation
- Response
- Recovery
- Equity

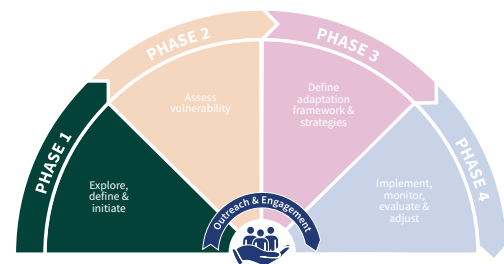
MAP PROJECT BOUNDARY

Early in the planning process, it is crucial to understand where the plan is applicable. General Plans will be applicable citywide, whereas LCPs only apply in the coastal zone. Defining the area will help determine the hazards and populations that will be included.

CREATE A TIMELINE

Creating a timeline can help set expectations for staff and community members that will be involved. The planning team should consider the following aspects when developing a timeline of events:

- Staff capacity
- Acquiring external support
- Data availability
- Community engagement
- External review



PHASE 1

Adaption Planning Guide:

Explore, Define and Initiate

STEPS

- 1.1 Motivation and Scope
- 1.2 Teams and Resources
- 1.3 Climate Effects and Community Elements
- 1.4 Outreach and Engagement

IDENTIFY CAPACITY

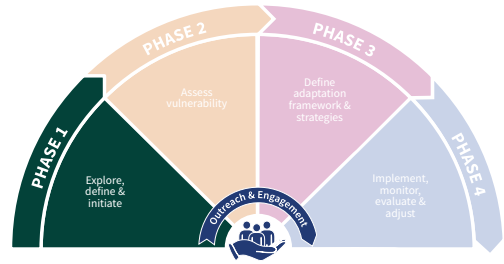
This is a pre-planning stage that is not always clearly outlined in a planning document. A plan with clear outlined partners is a good indicator this step was achieved.

LIST CORE TEAM MEMBERS

This is a pre-planning stage that is not always clearly outlined in a planning document. A plan with a range of agency and department representation and implementation is a good indicator this step was achieved.

INVENTORY TECHNICAL RESOURCES

This is a pre-planning stage that is not always clearly outlined in a planning document. A plan with clear data sources consistent with APG is a good indicator this step was achieved.



PHASE 1

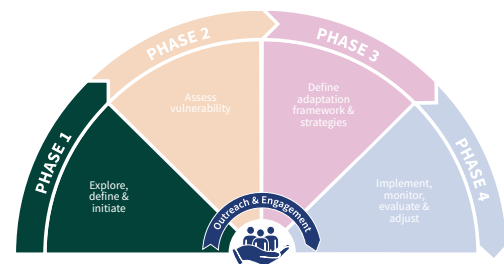
Adaption Planning Guide:

Explore, Define and Initiate

STEPS

- 1.1 Motivation and Scope
- 1.2 Teams and Resources
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- 1.4 Outreach and Engagement

The plan should outline historic hazard events and existing vulnerabilities. In Environmental Justice Elements, this will also include an assessment of how the built environment and past planning decisions have led to health inequities.



PHASE 1

Adaption Planning Guide:

Explore, Define and Initiate

STEPS

- 1.1 Motivation and Scope
- 1.2 Teams and Resources
- 1.3 Climate Effects and Community Elements
- 1.4 Outreach and Engagement

Community outreach and engagement should be integrated throughout the adaptation planning process to help inform the plan, build trust between the core planning team and community stakeholders, and build collective support for the plan. It is essential to enlist residents, businesses, students, and other community groups because they have knowledge, information, and ideas that local governments may not have or anticipate. Community members most affected by climate change can also collaborate on solutions, resulting in more effective implementation. Empowering community members to participate in the planning process is vital.

STAKEHOLDER MAPPING

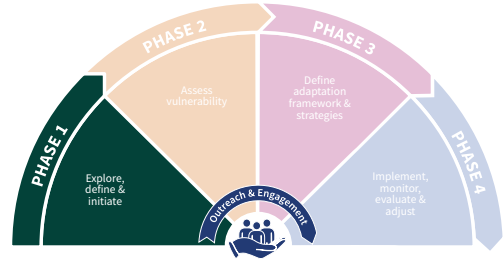
The project/plan team should generate a broad list of stakeholders, including all residents. For each

stakeholder group, their role should be defined, and how, when, and where they should be engaged. Access and language needs should also be assessed at this stage.

CREATING OUTREACH ACTIVITIES

Building on the stakeholder mapping, the project/plan team should develop outreach activities that reflect the progression of the project/plan. Stakeholder groups that will participate in each activity should be identified, along with the method of data collection (e.g. meeting, survey) and how that data will inform development of the plan.

The SANDAG Equity-First Approach to Climate Adaptation guidance document provides a general framework and best practices for designing, planning, and implementing a climate



PHASE 1

Adaption Planning Guide:

Explore, Define and Initiate

STEPS

- 1.1 Motivation and Scope
- 1.2 Teams and Resources
- 1.3 Climate Effects and Community Elements
- 1.4 Outreach and Engagement

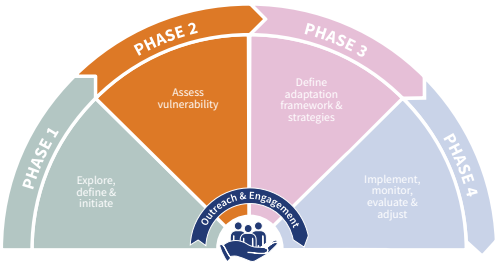
adaptation process that supports equitable outcomes. Within this, the document identifies trends, assumptions, emerging practices, indicators, metrics, and implementation opportunities that operationalize the equitable climate adaptation planning process. Furthermore, the Equity-First Approach to Climate Adaptation guidance connects to all phases (1-4) of the APG, and adds an additional Phase 0, “Equity-First Stage,” which provides the foundational knowledge and outlines the tools needed to create an equitable adaptation planning process.

FINDINGS FOR THE SAN DIEGO REGION

All jurisdictions are either currently in or have been in Phase 1 at some point in the last 5 years. Data and staff resources are two key components necessary to complete

the planning efforts ahead. Data was identified as the biggest need by jurisdictions, with nearly 70% of jurisdictions selecting this as a need. Surveying the data needs for the planning effort can be a major undertaking that can be overlooked, and technical assistance or regional tools in this area would be beneficial.

Another major need in Phase 1 is staff support. Jurisdictional staff were indicated to be the most involved and extensively used resource during the climate adaptation planning process. This can lead to staff resources being spread thin. Half of all jurisdictions surveyed identified staff capacity as a limiting factor in resilience planning .



PHASE 2

Adaption Planning Guide:

Assess Vulnerability

Start here if:

Extreme Heat: Planning team does NOT know the distribution of people sensitive to extreme heat, such as older adults, children, neighborhoods with older homes and those without air conditioning, and tree and park distribution.

Wildfire: Wildfire severity zones maps have NOT been updated with the most recent CAL FIRE data. Evacuation routes and communities with only one evacuation route have NOT been identified.

Inland Flooding: Flooding maps have NOT been updated with the most recent FEMA data. The planning team does NOT know the distribution of renters.

Sea-Level Rise: Sea-Level Rise Vulnerability Assessment has not been completed.

STEPS

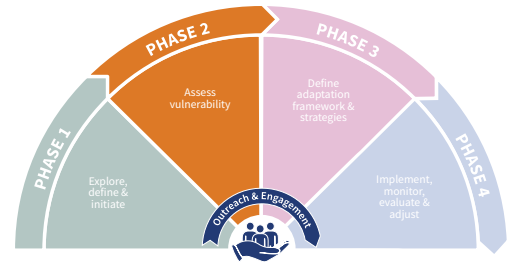
- 2.1 Exposure
- 2.2 Sensitivities & Potential Impacts
- 2.3 Adaptive Capacity
- 2.4 Vulnerability Scoring
- 2.5 Outreach and Engagement

LIST CLIMATE CHANGE HAZARDS

Each identified hazard should be accompanied by a description outlining who and where the hazard would impact. This discussion should include the forecasted impacts based on the best available data.

MAP HAZARDS

A series of maps should show hazardous areas. This can be based on data from State agencies, past events, or specific studies.



PHASE 2

Adaption Planning Guide: Assess Vulnerability

SELECT POPULATION ASSETS

The population groups are especially vulnerable to each potential climate hazard should be identified and mapped when feasible (e.g., disadvantaged communities). Then sensitive populations should be cross referenced with the hazards identified in the previous phase of the vulnerability assessment.

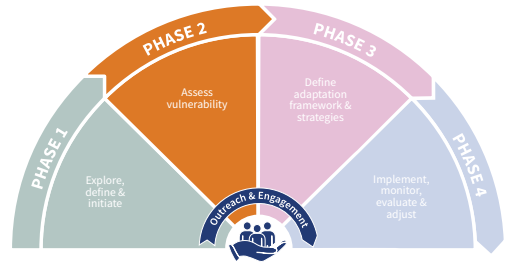
Similarly, critical assets, such as cellular communication and public utilities, and physical structures, such as fire stations and hospitals, should be identified.

IDENTIFY INTERSECTIONS OF HAZARDS, PEOPLE, AND THE BUILT ENVIRONMENT

Populations and assets should be mapped and compared to the mapped hazards to determine if programs or policies are needed to preserve the services the critical assets provide to the community.

STEPS

- 2.1 Exposure
- 2.2 Sensitivities & Potential Impacts**
- 2.3 Adaptive Capacity
- 2.4 Vulnerability Scoring
- 2.5 Outreach and Engagement



PHASE 2

Adaption Planning Guide: Assess Vulnerability

STEPS

- 2.1 Exposure
- 2.2 Sensitivities & Potential Impacts
- 2.3 Adaptive Capacity**
- 2.4 Vulnerability Scoring
- 2.5 Outreach and Engagement

DOCUMENT REVIEW

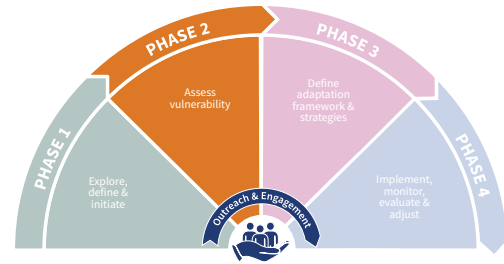
All relevant community plans, policies, and programs related to sustainability, climate change, hazard mitigation and emergency response should be reviewed. The plan should then outline how it relates to and is consistent with other local plans and priorities.

AGENCY AND STAKEHOLDER INTERVIEW

The plan should outline the role of outside agency staff in preparing for and responding to climate change. After stakeholders are identified under Phase 1, interviews and/or surveying should take place to gather input on their existing practices and potential future adaptation efforts. The California APG offers many resources with example questions to utilize for stakeholder interviews.

RESOURCE

[California APG Sample Stakeholder Questionnaire](#)



PHASE 2

Adaption Planning Guide: Assess Vulnerability

SUMMARIZE VULNERABILITY

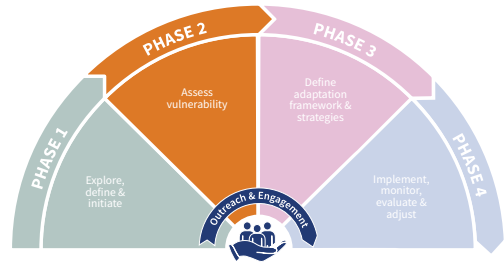
Complete findings and an outline of the priorities of the plan should be clearly indicated. The California APG suggests creating a table that summarizes vulnerabilities and consequences for communities.

SCORE VULNERABILITY

Hazard mitigation plans, such as Safety Elements and Local Hazard Mitigation Plans, should include an assessment of how much damage a hazard poses and how well prepared a community is to cope with that hazard. A scoring rubric should be identified, and scores can be added to the summary table to better help identify which threats should be prioritized.

STEPS

- 2.1 Exposure
- 2.2 Sensitivities & Potential Impacts
- 2.3 Adaptive Capacity
- 2.4 Vulnerability Scoring**
- 2.5 Outreach and Engagement



PHASE 2

Adaption Planning Guide: Assess Vulnerability

Community outreach and engagement should be integrated throughout the adaptation planning process to help inform the plan and build consensus on vulnerability assessment methodology between the core planning team and community stakeholders. It is essential to work across departments in local governments, and enlist residents, businesses, students, and other community groups due to the knowledge, information, and ideas that local governments may not have or anticipate.

FINDINGS FOR THE SAN DIEGO REGION

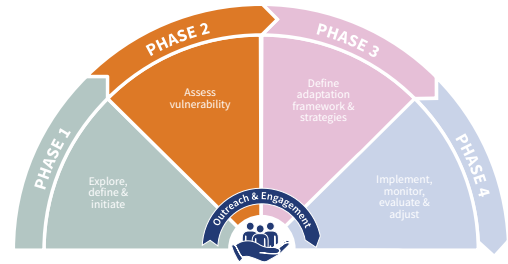
Phase 2 is an area that most jurisdictions have addressed in the past 5 years, but there are improvements that can be made related to vulnerability and capability assessments. Of the jurisdictions

that addressed Phase 2, most inventoried natural hazards and over half mapped or inventoried critical assets. However, only 36% of jurisdictions have inventoried or mapped vulnerable populations in the past 5 years. Without up-to-date information on vulnerable populations, implementors are less equipped to address inequities in infrastructure planning, emergency response, and funding allocation.

Jurisdictions may offset some of the need for a full vulnerable population inventory by involving community groups in the planning process who can represent and uplift the voices of vulnerable community members. Jurisdiction representatives stated that advocacy groups are commonly involved in climate resilience projects; however, social equity groups are generally less involved. For some jurisdictions, social equity groups

STEPS

- 2.1 Exposure
- 2.2 Sensitivities & Potential Impacts
- 2.3 Adaptive Capacity
- 2.4 Vulnerability Scoring
- 2.5 Outreach and Engagement**

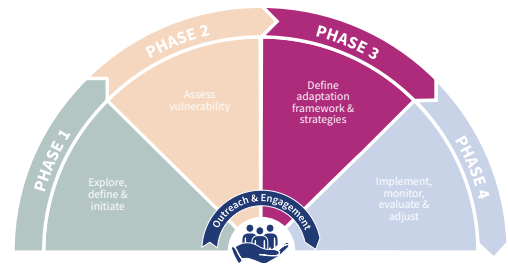


PHASE 2

Adaption Planning Guide: Assess Vulnerability

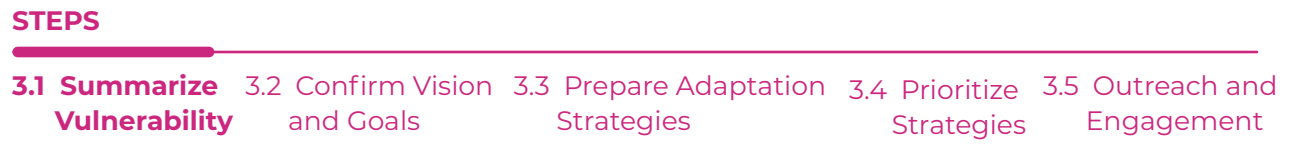


may not be apparent, and there is potential for schools, churches, or advocacy groups to fill that void. Drawing a clear connection between climate resilience and social equity while bolstering the communication between cities and local social equity groups is a strong way to improve the involvement of vulnerable populations.



PHASE 3

Adaption Planning Guide: Define Adaptation Framework and Strategies



WRITE PROBLEM STATEMENTS

For each hazard, there should be a clear and concise problem statement written in plain English to help stakeholders and the public understand the challenges at hand without getting into the technical specifics. These statements should identify critical issues for a community and can provide key information regarding which assets are particularly vulnerable or experience continuous impact. They can serve as a foundation that communities can use when seeking funding for future planning efforts or implementation projects.

RESOURCE

The Adapting to Rising Tides program offers helpful resources to get started on problem or issue statements.
[Issue Statements](#)

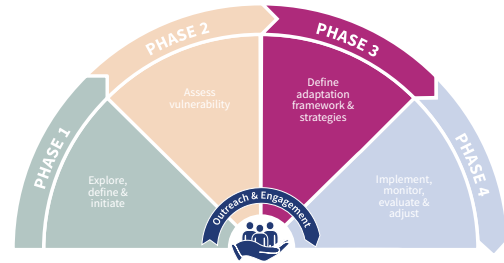
Start here if:

Extreme Heat: Planning team has NOT developed an implementation plan with measures to evaluate progress.

Wildfire: Planning team has NOT developed an implementation plan with measures to evaluate progress.

Inland Flooding: Planning team has NOT developed an implementation plan with measures to evaluate progress.

Sea-Level Rise: Planning team has NOT developed an implementation plan with a monitoring program to evaluate and modify strategies as needed.



PHASE 3

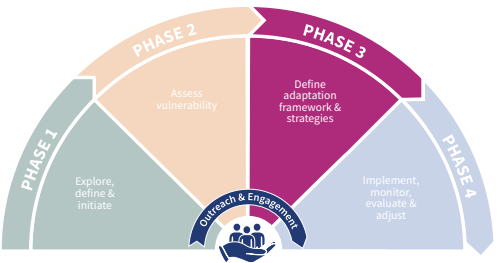
Adaption Planning Guide:

Define Adaptation Framework and Strategies



WRITE VISION GOALS AND OBJECTIVES

For each hazard, a goal that describes the future vision should be included in the plan. It is important to review the goals and objectives identified in Phase 1, Step 1.1 and ensure they align with community needs and priorities. Jurisdictions should strive to develop vision goals and objectives that are clear and accessible to their communities and stakeholders. There can be multiple goals per hazard, and they should be crafted to consider how progress can be best tracked and monitored. Goals should aim to protect assets, reduce climate hazard impacts, and help stakeholders understand how resilience relates to existing community priorities.



PHASE 3

Adaption Planning Guide:

Define Adaptation Framework and Strategies

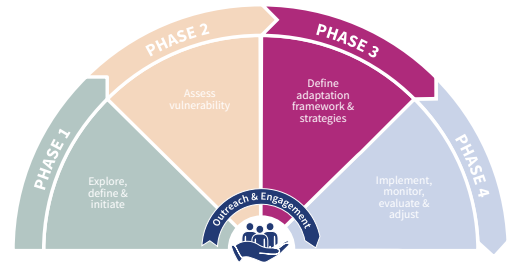


SELECT ADAPTATION STRATEGIES

For each goal, multiple adaptation strategies that outline how that vision will be achieved should be included. A successful adaptation strategy will include the following:

- Who is responsible for implementation
- How will it be achieved
- How will it be assessed
- What is needed to accomplish it
- When will it be accomplished
- How will it be funded

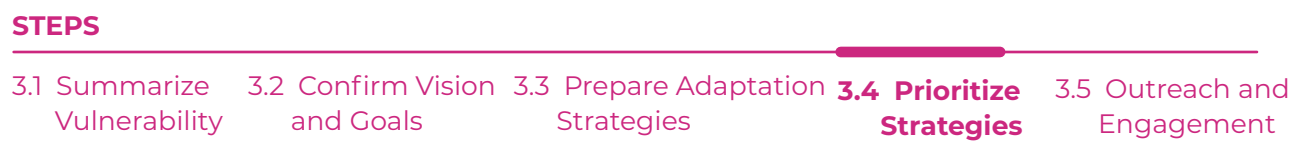
The format and specifications of strategies should mirror the requirements of the document the adaptation policy framework lives in. For example, Safety Elements and Hazard Mitigation Plans may have their own style and specific format compared to other planning documents.



PHASE 3

Adaption Planning Guide:

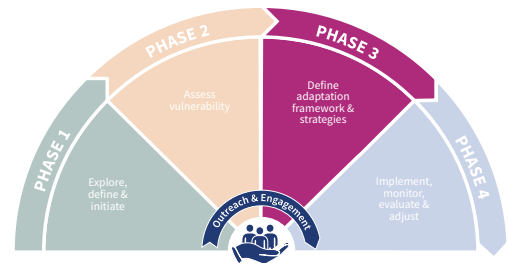
Define Adaptation Framework and Strategies



PRIORITIZE ADAPTATION STRATEGIES

For the strategies chosen, the plan should outline how these strategies were chosen and their co-benefits.

SANDAG has created a climate adaptation strategy prioritization methodology and tool for jurisdictions within San Diego County to employ. The tool uses a multicriteria analysis or evaluation, which is a qualitative analytic approach that can provide insights into how communities and jurisdictions make strategic decisions when there are multiple objectives (or criteria) to consider and the costs, benefits, or impacts of a particular strategy are difficult to quantify. This method emphasizes criteria that reflect the three pillars of sustainability (equity, economy, and environment), in addition to feasibility and robustness.



PHASE 3

Adaption Planning Guide:

Define Adaptation Framework and Strategies



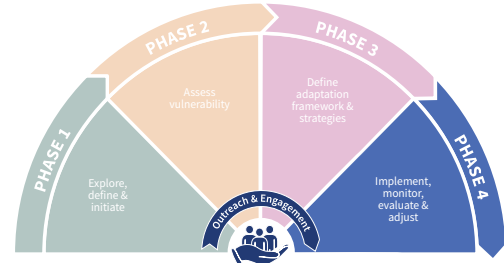
Community outreach and engagement should be integrated throughout the adaptation planning process to support project and strategy prioritization. To support project identification, the SANDAG Equity-First Approach to Climate Adaptation guidance document can be used to define and support equitable outcomes.

FINDINGS FOR THE SAN DIEGO REGION

Phase 3 has been undertaken by most jurisdictions during recent planning efforts. Several jurisdictions indicated that a resource that helps incorporate resilience strategies into existing general plans or local coastal programs would be beneficial. Others requested sharing best practices from around the region. And some requested a regional approach to certain

resilience projects would be helpful, allowing jurisdictions to contribute to and benefit from a more regional approach to hazard management.

One aspect of Phase 3 that presents an opportunity for more critical thinking and creativity is considering funding sources at the point of developing policies. Funding was identified as a major need by jurisdictions through survey data and focus group discussions. While funding opportunities are not always apparent during Phase 3, adding these details when possible can set jurisdictions up for success.



PHASE 4

Adaption Planning Guide:

Implement, Monitor, Evaluate, and Adjust

Start here if:

Extreme Heat: Planning team has NOT developed an implementation plan with measures to evaluate progress.

Wildfire: Planning team has NOT developed an implementation plan with measures to evaluate progress.

Inland Flooding: Planning team has NOT developed an implementation plan with measures to evaluate progress.

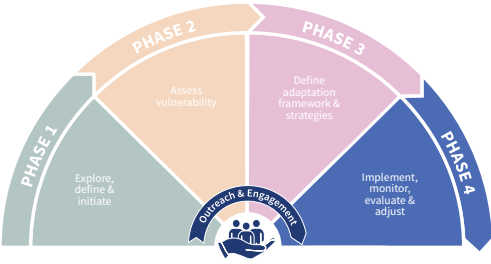
Sea-Level Rise: Planning team has NOT developed an implementation plan with a monitoring program to evaluate and modify strategies as needed.

STEPS

4.1 Implement 4.2 Monitor 4.3 Evaluate 4.4 Adjust

PREPARE AN IMPLEMENTATION PLAN

As part of a planning effort, or soon after a plan's adoption, an implementation plan should be drafted. Implementation plans outline the government mechanisms used, including funding opportunities and partners. Implementation plans are detailed and include new programs, capital improvements, and municipal code changes.



PHASE 4

Adaption Planning Guide:

Implement, Monitor, Evaluate, and Adjust

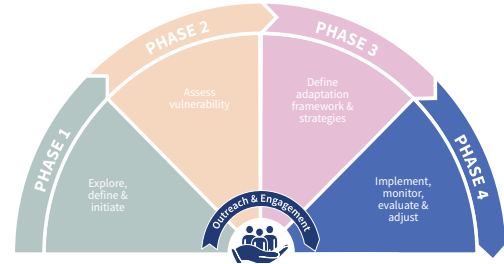
STEPS

4.1 Implement **4.2 Monitor** 4.3 Evaluate 4.4 Adjust

MONITOR EFFECTIVENESS

A monitoring plan should track if the implementation plan was achieved. This includes if programs were funded, or capital projects built. For incentive-based implementation, the change in development should be tracked. Monitoring measures local government effectiveness and if the plan was implemented as envisioned.

Jurisdictions can use the adaptation tools that were developed as a part of this Framework (see Tools chapter), as well as tools from the Holistic Implementation of Adaptation and Transportation Resilience Strategies project (see Appendix C. Additional Resources).



PHASE 4

Adaption Planning Guide:

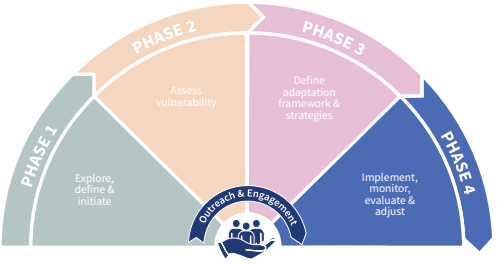
Implement, Monitor, Evaluate, and Adjust

STEPS

4.1 Implement 4.2 Monitor **4.3 Evaluate** 4.4 Adjust

EVALUATE SUCCESS

Evaluation measures the intended community effect of a strategy. This could include public health metrics or the percentage of people living near community assets or in hazard areas. This evaluation happens well after a plan is implemented.



PHASE 4

Adaption Planning Guide:

Implement, Monitor, Evaluate, and Adjust

STEPS

4.1 Implement 4.2 Monitor 4.3 Evaluate **4.4 Adjust**

ADJUST AND ADAPT

If a strategy is not as successful as intended, it should be adjusted. Similar to evaluation, this step occurs years after a plan is adopted.

Adaptation planning efforts do not end when the plan is finalized. Community outreach and engagement should continue as jurisdictions review lessons learned and outcomes from the planning process. Planning practitioners should continue collaboration with the community and stakeholders to solicit feedback and ideas for strategy adjustment when necessary.

FINDINGS FOR THE SAN DIEGO REGION

Phase 4, implementation, is an area that has had more limited success to this point. Over half of all jurisdictions surveyed had not identified a monitoring strategy, responsible party, funding method, or timeline for their resilience actions (see Figure 1). Of these four implementation elements, timelines were the most common for jurisdictions to have developed, while a funding source was the least common. This finding is consistent with input from jurisdictions that indicated funding technical assistance, such as grant identification and grant writing, is an area of need.



3

Adaptation Planning Tools

ADAPTATION PLANNING TOOLS

As part of the Framework project, three new adaptation planning tools were developed to be used by local planning practitioners. The project team worked with planners throughout the region to identify what adaptation and resilience planning tools would be most helpful to local agencies as they work towards moving through the planning phases. Feedback on the tools was collected through surveying and discussion during stakeholder meetings and an interactive training that was provided. Additionally, a Guidebook was developed to walk users through the tools. All three tools and the Guidebook are attached in Appendix A.

TOOLS GUIDEBOOK

The Tools Guidebook provides guidance on how to use each of the Framework Tools: Adaptation Pathways, Adaptation Metrics, and Adaptation Checklist. The guidebook outlines the purpose of each tool and when each tool should be used. The guidebook provides additional context and definitions to assist the users of the tools integrate them into their planning practice.

ADAPTATION PATHWAYS

The Adaptation Pathways tool utilizes observable conditions to represent a point in time when action must be taken to address hazard-related vulnerabilities (i.e., a trigger point). An appropriate trigger point provides enough notice and lead time to plan for and implement an adaptation strategy before vulnerabilities become severe. The Adaptation Pathways tool is an Excel Sheet where planners can input their existing adaptation strategies, categorize them, and link them to create adaptation pathways.

ADAPTATION METRICS

The Metrics Worksheet is to help define success in implementing adaptation strategies. This worksheet creates a common language across implementing departments so that stakeholders understand their progress. Planners would use the worksheet, to define the category of implementation along with the relevant hazards, priority communities, applicable equity considerations, and the implementing party. These definitions will assist the planners in creating target metrics, funding, and lead time. For each Implementation category (e.g. Capital Improvement, Development Standard, etc.) include sample metrics. The terms

used in the metrics are consistent with the Adaptation Pathways so that they can be used in tandem if desired. It is recommended that local agencies include metric development in the project request for proposals and project workplans as a final stage when feasible, otherwise the metric worksheet can be used by local agency staff after a plan is adopted.

ADAPTATION CHECKLIST

The Project Checklist is a tool jurisdictions can use to evaluate infrastructure improvements, other physical projects, resilience to climate change impacts based on the expected lifespan of the infrastructure, projected hazards, and community vulnerabilities. The Project Checklist then presents adaptation measures to ensure infrastructure improvements are designed to be resilient to conditions intensified by climate change, including the potential hazards of extreme heat, wildfires, inland flooding, and coastal flooding/sea level rise.



Conclusion



CONCLUSION

The Regional Resilience Framework provides member agencies with guidance to build resilience to climate change hazards in the region. SANDAG’s member agencies are encouraged to use the Framework , in conjunction with the provided adaptation tools, to plan and prepare for the impacts of sea-level rise, extreme heat, increasingly frequent and damaging wildfires, more frequent and severe rain events, and other climate-related issues. The Framework will help to strengthen adaptation and resilience planning efforts on a regional level.

Based on survey responses and stakeholder outreach, local jurisdictions will need further assistance assessing climate vulnerabilities and implementing plans and strategies. It is essential that SANDAG continues to partner with local sustainability staff to build consensus on regional adaptation priorities and implementation strategies. Through project research, desires were voiced for additional communication, cross-jurisdictional collaboration, and resource-sharing to identify, analyze, plan, and implement adaptation strategies regionwide. This type of effort will require increased staff capacity at regional and local government levels.

NEXT STEPS

Since climate impacts cross jurisdictional boundaries, continued adaptation planning on a regional level will support local government action. Collaboration and partnering on adaptation planning and projects can result in widespread resilience to climate hazards. The Regional Resilience Framework establishes an approach to adaptation planning that will support both the resilience of the regional transportation network and the communities we live, work, and play in.

To continue the momentum from the Framework and tools, a stable source of funding should be identified to support future regional and local adaptation and resilience planning efforts. Additionally, a vulnerability assessment of the regional transportation network will help to identify where transportation infrastructure improvements can be made to mitigate impacts from climate hazards. This would serve as a critical step in a regionally collaborative approach to developing a more resilient transportation network and support local governments with increased resilience of their communities in the face of climate impacts and hazards. Additionally, SANDAG intends to use the Framework to inform adaptation and resilience strategies in future Regional Plans.

SANDAG should prioritize implementing strategies that establish regional resilience to climate hazards and set jurisdictions up for chances to collaborate on future adaptation projects and funding opportunities. SANDAG is seeking grants to develop a nature-based solutions framework that can help local jurisdictions address implementation strategies. The nature-based solutions framework is a near-term planning action from the 2021 Regional Plan and would provide the region with a foundation for implementing sustainable solutions to climate impacts affecting our natural and built environments, while also providing co-benefits like carbon sequestration.

