

SCAG Climate Adaptation Framework

Principles and Metrics for SCAG Jurisdictions

prepared for

Southern California Association of Governments

prepared by

Cambridge Systematics, Inc.

with

Environmental Science Associates

Published: March, 2021



1.0 Adaptation Goals and Objectives

Tracking progress towards meeting adopted climate adaptation goals and objectives is an important part of the climate adaptation planning process. It is an opportunity to evaluate whether the policies, programs and projects put into place are contributing towards a more resilient future. It also provides the opportunity to determine whether the goals and objectives are still relevant to your community and progress towards achieving them can be tracked.

As part of the Southern California Association of Governments (SCAG) Climate Adaptation Framework, this document outlines four sample climate adaptation goals. These goals, listed below, are consistent with California's Integrated Climate Adaptation and Resiliency Program (ICARP)¹ and can be a useful organizing framework for communities to address the challenges of climate change.

- **Goal 1: Resilient Communities.** All people and communities respond to changing average conditions, shocks, and stresses in a manner that minimizes risks to public health, safety, and economic disruption and maximizes equity and protection of the most vulnerable.
- **Goal 2: Resilient Natural Environment.** Natural systems adjust and maintain functioning ecosystems in the face of change.
- **Goal 3: Resilient Infrastructure and Built Environment.** Infrastructure and built systems withstand changing conditions and shocks, including changes in climate, while continuing to provide essential services.
- **Goal 4: Resilient Processes.** Each jurisdiction has the policies, institutional structures, and monitoring processes to implement adaptation strategies.

The performance monitoring framework provided in the following pages can be used by local agencies to track progress towards meeting their climate adaptation goals.

ICARP PRINCIPLES

California's Integrated Climate Adaptation and Resiliency Program (ICARP), which was established by Senate Bill 246, signed into law by Governor Jerry Brown in 2015. In 2017, the ICARP Technical Advisory Council developed a vision statement that expresses the characteristics of a resilient California, as well as principles that guide how adaptation actions should be implemented to achieve this vision. An abridged version of the principles include:

1. Promote co-benefits
2. Foster equity
3. Utilize green infrastructure
4. Avoid maladaptation
5. Use best available science
6. Be flexible and collaborate
7. Immediate action and long-term thinking

¹ California Office of Planning and Research. Integrated Climate Adaptation and Resiliency Program: <http://opr.ca.gov/planning/icarp/tac/>

Climate Adaptation Objectives and Metrics

Table 1 on the following page includes sample climate adaptation objectives associated with each goal along with a suite of metrics. These objectives and metrics are intended for local and regional jurisdictions. The list of metrics is not an exhaustive list of all metrics a jurisdiction may want to track, nor should jurisdictions be expected to track all of these metrics. Rather, these metrics are sample performance measures to help agencies measure progress towards each climate adaptation objective they pursue. There are some important considerations for agencies to keep in mind when selecting metrics:

- Metrics can be outcome oriented or process-oriented. The majority of the metrics included below are process-oriented metrics, which tracks what an agency does (e.g., update the General Plan Safety Element or dollars invested in climate adaptation programs). Outcome-oriented metrics measure the progress towards a desired outcome (e.g. reduction in acres consumed by wildfire).
- The objectives and associated metrics should make sense for the specific jurisdiction. Outcome-oriented metrics should generally be limited to what the agency can control or influence through collaboration and partnerships. In some cases, a jurisdiction may want to track a given metric to better inform the public or another agency responsible for implementing a certain adaptation strategy. The metrics should also be valuable and meaningful to local constituents or decision-makers.
- Metrics should be quantifiable. There may be no available data to track the performance of a particular action. If monitoring or data collection is not possible, other metrics may be better suited for the particular action.
- It is important to have context for the metrics. Measuring changes over time or using percentages adds relativity to the metric and is an effective way to make the metrics meaningful. It is useful to establish a baseline in order to have a point of comparison for the particular metric.
- Various metrics below refer to “co-benefits”. Co-benefits refer to additional climate adaptation or climate change mitigation (e.g., reducing greenhouse gas emissions) benefits beyond the primary project benefit. For example, a wetland restoration may have the benefit of severe weather flood control, but in some areas, it may also provide for a reduction in urban heat island effects.

Table 1. Climate Adaptation Performance Monitoring Framework

Sample Adaptation Objectives		Sample Adaptation Outcome Metrics
Goal 1: Resilient Communities. All people and communities respond to changing average conditions, shocks, and stresses resulting from climate change in a manner that minimizes risks to public health, safety, and economic disruption and maximizes equity and protection of the most vulnerable.		
1	Identify populations that will disproportionately experience the consequences of climate change.	<ul style="list-style-type: none"> • Report prepared identifying disproportionately vulnerable populations, including communities of color and low-income populations, to climate change • Report updated at every decennial census • Report updated subsequent to major update to CalEnviroScreen
2	Deepen and focus engagement with disproportionately vulnerable communities.	<ul style="list-style-type: none"> • \$ invested in climate adaptation education • % of outreach budget targeting disproportionately vulnerable communities • % of materials translated into multiple languages • # of people engaged at community events in vulnerable communities • # of residents reached in communities of color and low-income populations • # of touch points / impressions • % of people aware of potential risks (based on targeted surveys) • # of partnerships with community-based organizations
3	Address underlying health inequities for all residents, including those related to hazards such as localized air pollution, extreme heat, and flooding; access to basic health services; and access to affordable and nutritious foods.	<ul style="list-style-type: none"> • # of partnerships established with local public health department, health providers and academic institutions • % of climate change educational materials that address public health • Population within 15 minutes of healthcare facility • # of hospital beds per 1000 residents • # of grocery stores with fresh produce per 1000 residents • # of farmer markets per 1000 residents • # of acres of farmland conserved • % reduction in food desert area • Improved access to basic goods and services in communities of color and low-income populations
4	Improve emergency preparedness and planning with a particular focus on disproportionately vulnerable populations.	<ul style="list-style-type: none"> • Emergency operations plan incorporates special considerations for vulnerable populations • # of years between updates to emergency operations plan • # of households in communities of color and low-income populations with emergency preparedness plans in place

Sample Adaptation Objectives		Sample Adaptation Outcome Metrics
5	Directly build and support grassroots capacity to adapt to climate impacts.	<ul style="list-style-type: none"> • # of local advocacy groups targeting climate impacts • Membership of local climate change advocacy groups • \$ invested in local climate change advocacy groups • # of workshop trainings targeting local leaders
6	Prioritize solutions towards reducing climate change risks for vulnerable populations and communities.	<ul style="list-style-type: none"> • \$ invested to reduce risk for vulnerable populations • # of projects with co-benefits to reduce risk for vulnerable populations • % of projects benefiting communities of color and low-income populations
7	Ensure that adaptation initiatives provide multiple co-benefits, including reduction in greenhouse gas emissions, support for the local economy, enhancements to the natural environment, or alleviating underlying health inequities.	<ul style="list-style-type: none"> • # of adaptation projects with co-benefits • % of adopted adaptation strategies that support GHG reduction • Estimated reduction in GHG (Million Metric Tons of CO₂ equivalent) • Estimated enhancement of habitat areas (acreage) • % of adopted adaptation strategies that benefit the natural environment • % of adopted adaptation strategies that benefit the local economy, including improved economic opportunity in communities of color and low-income populations • % of adaptation strategies that address underlying health inequities • % increase in access to parks and open space in communities of color and low-income populations
8	Incorporate inclusive decision-making in resilience-based planning efforts.	<ul style="list-style-type: none"> • % of project budget dedicated to outreach, including in communities of color and low-income populations • Public participation plan prepared for major adaptation planning efforts or adaptation projects, including strategies on how to engage hard-to-reach populations • % of materials translated into multiple languages • # of engagement opportunities by type of involvement: 1) inform, 2) consult, 3) involve, 4) collaborate, 5) empower • # of people engaged at community events, including people from communities of color and low-income populations • # of touch points / impressions • # of community input suggestions incorporated into planning efforts • # of International Association for Public Participation 2 staff certifications or similar training
9	Promote the integration of economic development and climate adaptation to provide sustainable resiliency benefits.	<ul style="list-style-type: none"> • Benefit to local economy outweighs adaptation project cost • Cost effectiveness of adaptation projects (dollars per estimated benefit) • # of adaptation projects that promote economic development as a co-benefit • % of adaptation project budget dedicated to economic development in communities of color and low-income populations

Sample Adaptation Objectives		Sample Adaptation Outcome Metrics
10	Leverage land use planning to promote resilience and reduce exposure to climate hazards.	<ul style="list-style-type: none"> • % reduction in rate of new residential units, including in communities of color and low-income communities, approved in climate-change related hazard zones • % of land zoned to allow residential use in climate change-related hazard zones • % of land zoned to allow critical facilities in climate change-related hazard zones • Zoning ordinances limiting new development and redevelopment in climate change-related hazard zones • Reduction in rate of land with habitat value consumed for development • # of acres of land preserved for agriculture • Proximity of households and schools to toxic sites, including those in communities of color and low-income populations
Goal 2: Resilient Natural Environment. Natural and managed systems adjust and maintain essential services for people and wildlife in the face of climate change.		
11	Design and implement nature-based projects and green infrastructure to protect and enhance the adaptive capacity of natural resources and urban environments.	<ul style="list-style-type: none"> • % of stormwater investments that integrate low impact development best practices • # of habitat restoration projects that improve resilience • % of city with tree canopy, including % in communities of color and low-income populations • # of low impact development projects implemented • Requirement for new and redevelopment to integrate low impact development in site design and operation
12	Develop and implement plans that allow habitat and species to move under changing climate conditions.	<ul style="list-style-type: none"> • Existence of species conservation plans • Species conservation plans incorporate climate change impacts, including species with cultural significance • \$ invested in species conservation, including species with cultural significance • \$ invested in wildlife corridors
13	Restore and enhance degraded habitats to increase capacity for species to adapt to climate change.	<ul style="list-style-type: none"> • \$ invested in habitat restoration or enhancement • Acres of land restored or enhanced
14	Protect and maintain sensitive habitat, particularly in high-risk areas.	<ul style="list-style-type: none"> • % of sensitive habitat preserved • Acres of sensitive habitat preserved
15	Manage future flood risk by prioritizing the use of nature-based solutions.	<ul style="list-style-type: none"> • # of flood management projects which include habitat creation • % of area covered by impervious surface • % of base flood plain covered by impervious surface • Acres of wetland preserved/restored • # of green/natural infrastructure projects located in communities of color and low-income populations
16	Protect agriculture and rangelands and other managed resources from the anticipated effects of climate change through land conservation practices and improved management practices.	<ul style="list-style-type: none"> • # of acres of land preserved for agriculture • # of technical workshops held on management practices

Sample Adaptation Objectives		Sample Adaptation Outcome Metrics
		<ul style="list-style-type: none"> \$ invested in outreach program to farmers
Goal 3: Resilient Infrastructure and Built Environment. Infrastructure and built systems withstand changing conditions and shocks, including changes in climate, while continuing to provide essential services.		
17	Include short- and long-term actions in the capital improvement program which would promote resiliency of physical infrastructure to climate change impacts.	<ul style="list-style-type: none"> \$ invested/programmed for resiliency infrastructure projects # of adaptation projects incorporated into capital improvement plans % invested/programmed for resiliency infrastructure projects in communities of color and low-income populations
18	Ensure residents have access to basic services such as electricity, gas, water, sewage treatment, public transportation, telephone lines, and wireless communication during and after climate hazard events.	<ul style="list-style-type: none"> % reduction in down time for utilities during storm events Identified critical bottlenecks or vulnerabilities in service provision Solutions or redundancies created to alleviate critical bottlenecks % of critical facilities with back up power
19	Upgrade existing buildings and design new buildings and development projects to withstand climate change impacts.	<ul style="list-style-type: none"> Local building codes updated to account for climate impacts % of local building codes that are updated in communities of color and low-income populations
20	Plan efficient and reliable transportation systems for emergencies.	<ul style="list-style-type: none"> Existence of evacuation plan % of population with multiple evacuation routes \$ invested identifying solutions for communities without secondary access routes % of transportation network resilient to emergency events
21	Implement successful adaptation strategies, designs, and building practices that can increase the transportation system's ability to address identified vulnerabilities	<ul style="list-style-type: none"> # of critical transportation assets upgraded to withstand climate impacts # of transportation resiliency projects \$ invested in improving transportation resilience % of transportation project budget dedicated to improving resilience to climate change, including in communities of color and low-income populations
Goal 4: Resilient Processes. Each jurisdiction has the policies, institutional structures, and monitoring processes to implement adaptation strategies.		
22	Monitor local changes in temperature, extreme heat days, heat waves, water supply, flood events, wildfire events, and sea-levels to inform policy and planning decisions. Regularly reassess climate vulnerabilities in response to changing conditions.	<ul style="list-style-type: none"> Monitoring reports prepared every 5 years Updates to vulnerability assessments made every 10 years Monitoring reports for climate risks to communities of color and low-income populations Monitoring tracking tool regularly updated by staff from multiple departments

Sample Adaptation Objectives		Sample Adaptation Outcome Metrics
23	On a regular basis, update and implement an action plan to address climate change-related risks consistent with changes in best available science and local monitoring reports.	<ul style="list-style-type: none"> • # of adaptation projects incorporated into capital improvement plans • Climate adaptation action plan completed in last five years • # of adaptation projects incorporated into planning commission work plan • # of adaptation projects identified as council priority
24	Monitor the effectiveness of adaptation strategies.	<ul style="list-style-type: none"> • # of monitoring reports prepared • # of variables evaluated in monitoring reports • % of projects adjusted to improve effectiveness
25	Align public infrastructure and investment decisions with the local government climate change action and/or adaptation plan.	<ul style="list-style-type: none"> • % of public infrastructure projects that further the goals of the climate adaptation plan • % of investments which further the goals of the climate adaptation plan • Climate adaptation and racial and environmental equity incorporated into prioritization criteria for public projects
26	Promote near-term climate adaptation and mitigation strategies that do not preclude or prevent implementation of strategies that address longer-term hazards.	<ul style="list-style-type: none"> • # of public projects that analyzed potential to preclude future adaptation strategies • Analysis conducted on project impacts to communities of color and low-income populations
27	Incorporate climate change considerations in existing planning documents and decision-making frameworks.	<ul style="list-style-type: none"> • # of plans updated to include climate adaptation • Update general plan safety element to include climate adaptation • Update local hazard mitigation plan to include climate adaptation • Update general plan environmental justice element to include climate adaptation • Prepare climate adaptation plan • # of decision-making frameworks revised to integrate climate adaptation
28	Collaborate with local, regional, and tribal jurisdictions to maximize community resilience.	<ul style="list-style-type: none"> • # of working groups joined/formed • Frequency of participation in regional dialogue • Membership and attendance in regional climate collaboratives • # of community members and community-based organizations included