



REGIONAL CLIMATE ACTION PLANNING FRAMEWORK



TECHNICAL APPENDIX IV

CAP Implementation Cost Analysis

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PREPARED BY



PREPARED FOR

SANDAG

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TABLE OF CONTENTS

1. Introduction	1
1.1 Guiding principles	1
1.2 Summary of updates included in Version 1.1	1
1.3 Organization of report	2
2. CAP implementation cost analysis overview	2
2.1 What is a CAP implementation cost analysis?	2
2.1.1 Connection to benefit-cost analysis of CAP measures	3
2.2 When to conduct CAP implementation cost analysis	4
2.2.1 CAP development	5
2.2.2 Implementation plan	5
2.2.3 Monitoring and reporting	5
2.3 Updating the implementation cost analysis	5
3. Process and method to estimate CAP implementation costs	6
3.1 Identify anticipated CAP tasks	7
3.2 Identify anticipated staffing and non-staffing needs	7
3.3 Estimate CAP implementation costs	7
3.4 Data collection	8
3.4.1 Details about CAP measures and actions	8
3.4.2 Staff positions and hourly rates	8
3.4.3 Level of effort and cost data to implement CAP activities	8
3.4.4 Quality control and data validation	9
3.5 Level of effort to complete ICA	9
4. Which CAP implementation costs to include	10
4.1 Expenditure categories	10
4.1.1 Capital	10
4.1.2 Salary and benefits	10
4.1.3 Consultants	11
4.1.4 Materials and supplies	11
4.2 Other cost considerations	11
4.2.1 Lost revenue	11
4.2.2 Operational efficiencies	11
4.2.3 Ability to compete for grant funding	11
5. Considerations for evaluating CAP implementation costs	12
5.1 Program status	12
5.2 Staff position status	12
5.3 Funding status	13
5.4 Total or incremental costs	13
5.5 Funding sources	14
5.6 Timeframe of analysis	14
6. Presenting the results	14
6.1 Overall Total and Annual Results	14
6.2 By expenditure type	16
6.2.1 Staffing impacts (FTE)	17
6.3 By CAP measure	17
6.4 By department	18
6.5 By staff position	20
6.5.1 Staff impact (FTE) by position	20
6.6 Examples of ICA reports	21

7. Limitations of CAP ICAs	22
7.1 CAP status.....	22
7.2 Preliminary estimate	22
7.3 Limited time horizon	22
7.4 Limited scope of analysis	22
7.5 Cost savings not considered	22
7.6 GHG emissions not considered.....	23
8. Conclusion	24

1. Introduction

This document is Appendix IV to the SANDAG Regional Climate Action Planning Framework (ReCAP). It provides guidance on estimating the cost to local jurisdictions of implementing Climate Action Plan (CAP) measures. Local decision-makers and community stakeholders often request this information during the climate action planning process.

The information presented in this appendix summarizes the process and considerations for estimating budget impacts incurred by a local jurisdiction to implement CAP measures. The costs borne by residents and businesses who are affected by CAP measures are not considered in this appendix but are addressed in Technical Appendix III – Benefit-Cost Analysis of CAP Measures, which evaluates the overall cost-effectiveness of CAP measures and the corresponding impact on residents, businesses, and other measure participants.

While this appendix focuses on the implementation costs incurred by local jurisdictions to implement CAP measures, there are many other factors to consider when evaluating greenhouse gas (GHG) reduction measures, including the authority of the local jurisdiction, GHG reduction potential, time required to implement, policy changes required, and staff commitment.

1.1 Guiding principles

This document is developed under the following guiding principles:

- **Transparency:** methods are transparent to readers and uncertainty is recognized to the extent possible;
- **Use of accepted methods:** methods are based on generally-accepted best practices and utilize standard economic metrics;
- **Data-driven:** methods incorporate applicable benefits and costs for multiple perspectives, which are supported by relevant and available data;
- **Local relevancy:** data are relevant to the jurisdictions in the San Diego region to the extent possible;
- **Regional consistency:** methods are applied consistently across measures within a CAP and across different CAPs to the extent feasible; and
- **Flexibility and adaptability:** methods are regularly updated to be consistent with best practices.

1.2 Summary of updates included in Version 1.1

In addition to general edits, the following changes were made to the original version of this appendix.

Section 2

- Section 2.1 was updated to clarify that an ICA typically covers an initial implementation period (e.g., first five years) and that ICAs also can help determine staffing impacts, measured in full-time equivalent, and incremental costs that would not have occurred without CAP adoption.
- Section 2.2 was updated to clarify that ICAs are typically done at CAP development stage, not GHG reduction development stage. Updates also highlight that developing a list of implementation actions for each CAP measure is a critical step in the ICA process.

Section 3

- Section 3.4 was updated to include more detail about the data collection process, the different stages in the process, and typical data collection approaches. Also, a section on quality control and data validation was added.
- Section 3.5 was added to provide information on the factors that can influence the level of work required and the time to complete an ICA project.

Section 4

- Section 4.11 was updated to clarify that capital cost estimates can include annual increases to account for inflation, similar to personnel costs.
- Section 4.1.2 was updated to remove explanation of incremental staff impact (FTE).

Section 6

- Subsections reordered to follow more closely the order used in ICA reports.
- Section 6.2.1 was updated to remove references to cumulative totals.
- Section 6.3 was updated to include an example of using the heat map coloring approach to tables.
- Section 6.5 was added to provide results by staff position.
- Section 6.7 was added to provide examples of and compare completed ICA reports.

Section 7

- Section 7.5 was added to clarify that an ICA assesses upfront costs only and does not consider cost savings.

1.3 Organization of report

Section 2 of this report presents an overview of a CAP implementation cost analysis (ICA), including a discussion of the connection with the benefit-cost analysis of CAP measures, and when to conduct an ICA during the climate action planning process. An overview of the processes and methods typically used to develop an ICA are described in Section 3. Section 4 summarizes the expenditure types that can comprise an ICA, including capital costs, salary and benefits, consultant costs, and supplies and materials. Section 5 discusses the many variables to consider when evaluating costs, such as whether a CAP implementation activity already exists or is part of a new or expanded effort, whether CAP activities have identified funding or whether a funding source is needed, whether to focus on total costs or incremental costs, and the time horizon of the analysis. Results of a cost analysis can be presented in a variety of ways that break down costs by CAP strategy, CAP measure, local jurisdiction department, and expenditure type. Example results are used in Section 6 to demonstrate different presentation approaches. Section 7 discusses the inherent limitations to consider when undertaking a CAP ICA and Section 8 provides a brief conclusion.

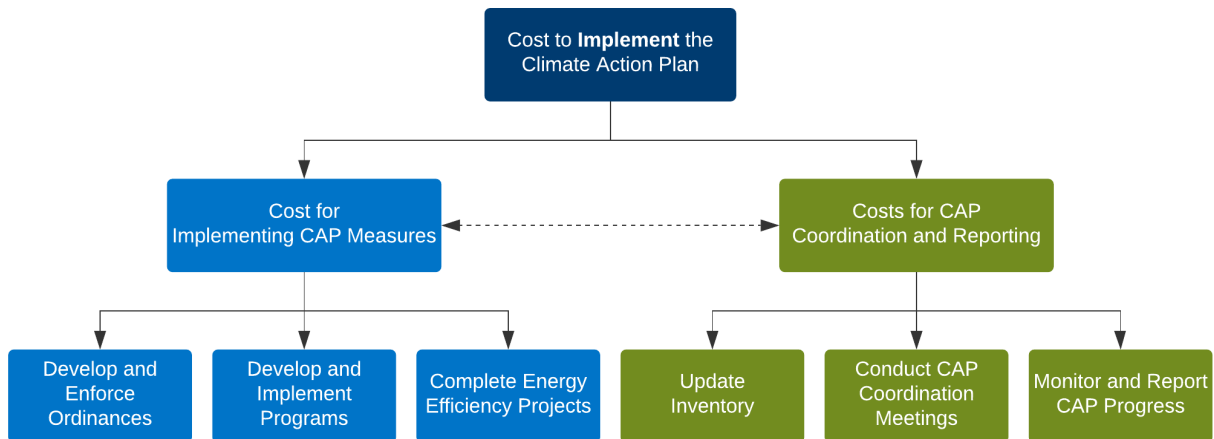
2. CAP implementation cost analysis overview

2.1 What is a CAP implementation cost analysis?

A CAP ICA estimates costs incurred by the local jurisdiction to implement CAP measures and associated activities over an initial period (e.g., first five years). It answers the question: **What is the budgetary impact to the local jurisdiction to implement CAP measures?** CAP ICAs can also help determine staffing impacts and incremental costs that are due to the adoption of a CAP.

This analysis considers costs associated with two broad categories of CAP implementation: (1) activities directly related to CAP measures and (2) overall CAP coordination and reporting. The first category includes activities to develop and implement CAP measures, such as developing ordinances and programs, conducting education and outreach, implementing energy or water saving projects in local jurisdiction facilities, and building bike lanes (Figure 1, blue boxes). The second category of activities includes regularly conducting GHG inventories to track progress, regularly reporting CAP progress, and internal coordination among departments (Figure 1, green boxes). These two categories are related and complementary.

Figure 1 General cost types included in implementation cost analysis



2.1.1 Connection to benefit-cost analysis of CAP measures

In addition to the fiscal impacts to a local jurisdiction, decision-makers and stakeholders may be interested to know the estimated costs that could be borne by residents and businesses who are affected by CAP measures. These costs are not considered in this report but are addressed in Technical Appendix III: Benefit-Cost Analysis of CAP Measures,¹ which combines costs to the local jurisdiction with the benefits and costs to all those who directly participate in CAP measure activities.

The benefit-cost analysis uses a framework adapted from the California Standard Practice Manual (SPM)² to estimate the benefits and costs associated with each measure. The SPM identifies four major perspectives, which help focus results on who is experiencing costs and benefits. This analysis presents results for the following perspectives, adapted from the SPM:

- The local jurisdiction, which administers and implements the CAP measures (**administrator**);
- Homes, businesses, and, in some cases, the local jurisdiction, that participate in an activity defined in the CAP measure (**participant**);
- Local taxpayers or utility ratepayers that fund subsidies used by certain CAP measures (**non-participants**); and
- **Society** in general, which may incur costs or benefits related to external impacts like public health effects.

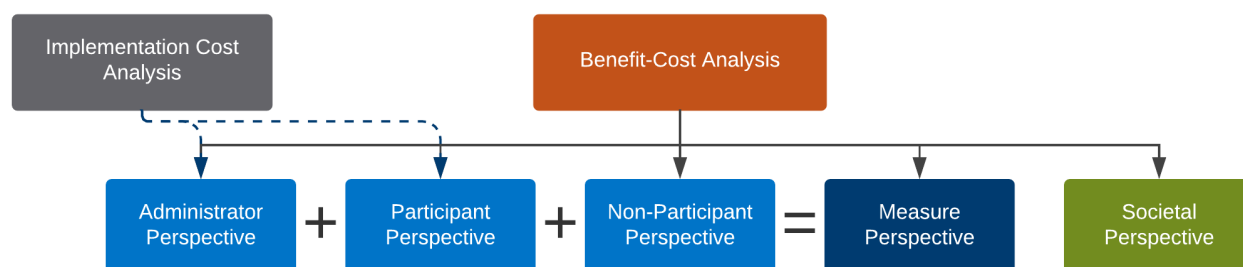
The **measure perspective**—a combination of the administrator, participant, and non-participant perspectives—results in a comprehensive view of the CAP measures. More details on the framework and methods used in the benefit-cost analysis are provided in Appendix III: Benefit-Cost Analysis of CAP Measures.

¹ Appendix III: Benefit-Cost Analysis of CAP Measures.

² California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects (California Public Utilities Commission 2001).

Results of the CAP ICA can feed into the administrator and participant perspectives of a benefit-cost analysis of CAP measures (Figure 2). For the administrator perspective, this generally includes non-capital costs incurred to implement CAP measures. For the participant perspective, this includes capital costs to the local jurisdiction related to CAP measures that affect municipal operations or local infrastructure (e.g., bike lanes).

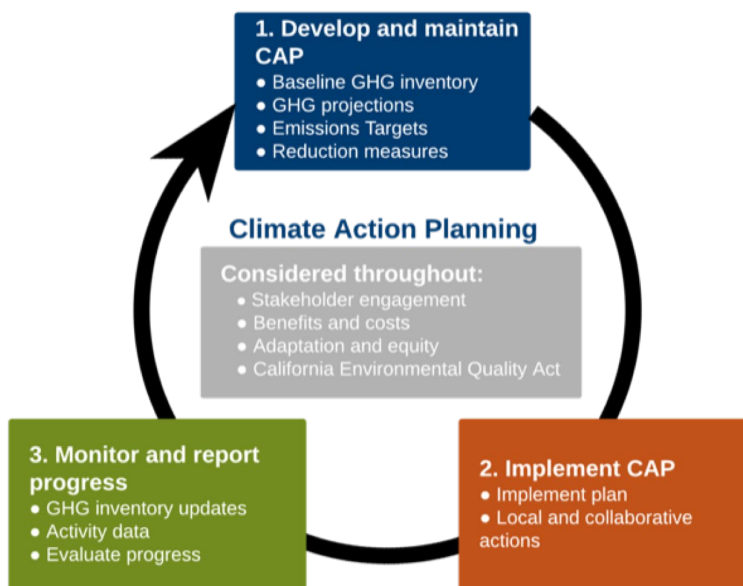
Figure 2 Perspectives for benefit-cost analysis and the role of implementation costs



2.2 When to conduct CAP implementation cost analysis

Figure 3 presents the overall climate action planning process. A local jurisdiction may consider developing an ICA during one of several steps in the climate action planning process, including during the CAP development and initial drafting process, when an implementation plan is developed, during the monitoring and reporting process, or when the CAP is being updated. The decision of when to conduct an ICA is based on the preference of the local jurisdiction and may be influenced by the completion timeline of a CAP, available funding, and staff availability. The following sections describe how an ICA could be considered during each of these steps.

Figure 3 Climate action planning process



2.2.1 CAP development

It is common to complete an ICA toward the end of the CAP measure selection process, once a local jurisdiction has developed a suite of potential GHG reduction measures and implementation actions to achieve proposed GHG targets. Understanding the cost to a local jurisdiction to implement a CAP measure can help inform the final measure selection process. Staff input and time are necessary to complete an ICA, which is a factor in determining whether to estimate implementation costs at this point in the CAP process. The level of staff involvement depends in part on the scope and complexity of the ICA: the more comprehensive the scope of the analysis, the more staff input is needed. More detail on the types of activities staff can expect to undertake are provided in Section 3.4. Section 3.5 discusses factors that determine the scope of an ICA analysis.

Results from an ICA can also be included in the implementation section of a CAP. Having numeric cost estimates for the potential budgetary impacts to a local jurisdiction at the time a CAP is being considered for approval provides an additional level of specificity for decision-makers and stakeholders.

An ICA can also occur when a local jurisdiction is updating a CAP. In addition to monitoring, some CAPs also call for regular CAP updates. For example, the City of San Diego CAP, which was adopted in 2015, calls for the document to be updated in 2020. An ICA can inform the CAP update process in ways similar to those described above in this section.

2.2.2 Implementation plan

If a detailed estimate of CAP implementation costs is not completed or included in the CAP document, the analysis can be completed at the time a local jurisdiction develops a standalone CAP implementation plan, after the CAP is adopted. Similar to considering cost during CAP development, conducting a cost analysis for an implementation plan provides results that can be considered with a range of other variables to help decision-makers and staff prioritize when measures are implemented. Since implementation tasks would typically be better defined at this point, it can be more efficient to develop the ICA and implementation plans documents at the same time.

2.2.3 Monitoring and reporting

Many CAPs include requirements to regularly monitor and report on the progress of measure implementation and emissions reductions. At this point in the climate action planning process, local jurisdictions could evaluate numerous aspects of the CAP to determine progress, including overall emissions, emissions by sector, performance metrics associated with specific measures and actions, and whether supporting activities have been completed.³ If results of monitoring efforts show that emissions levels are not on track to meet targets, local jurisdictions can reconsider existing measures that are not reducing emissions as expected and add new measures to achieve additional GHG reductions. An ICA can be completed at this point to provide staff and decision-makers with information about the fiscal impact of new or modified GHG reduction measures.

2.3 Updating the implementation cost analysis

Once an initial analysis is complete, either for CAP development or for an implementation plan, subsequent ICAs generally respond to specific changes to a CAP, including the impacts of adding, altering, or removing CAP measures. In these cases, the analysis would likely be specific to the changes being proposed, rather than updating the entire ICA.

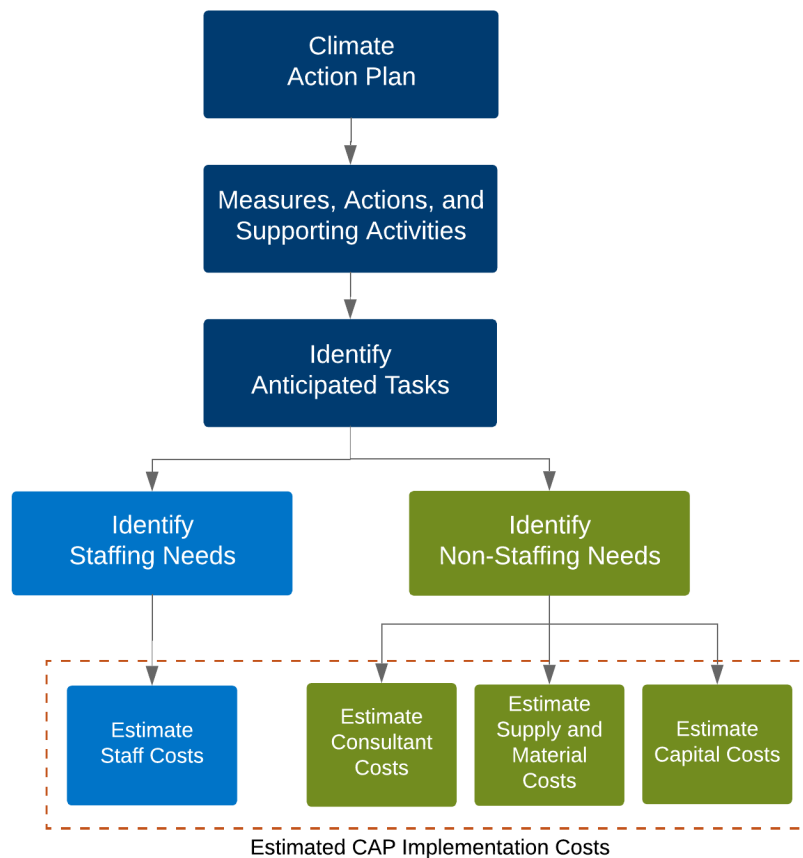
It may be necessary to periodically update the ICA for the entire CAP—including any modifications—to understand the impacts of changes that have occurred through the monitoring process. If a CAP is being updated regularly, these update intervals could serve as a point in time to update a CAP ICA. This would allow the local jurisdiction to evaluate the collective impact of any changes to the CAP and to project and plan for future budget impacts.

³ For more details on considerations for monitoring and reporting progress, see Appendix VI: Climate Action Plan Monitoring and Reporting.

3. Process and method to estimate CAP implementation costs

The goal of a CAP ICA is to estimate the cost to implement activities called for in CAP measures and actions over an initial period (e.g., first five years). The general steps in the process are to: identify the anticipated tasks required to implement CAP actions; identify the staffing needs to complete the required tasks; identify the non-staffing needs; and estimate staffing costs and non-staffing costs, including capital, consultant, and supply and material expenditures (Figure 4). This is a data-driven process based on inputs and estimates from local jurisdiction staff. This section briefly describes each step, including overall data collection.

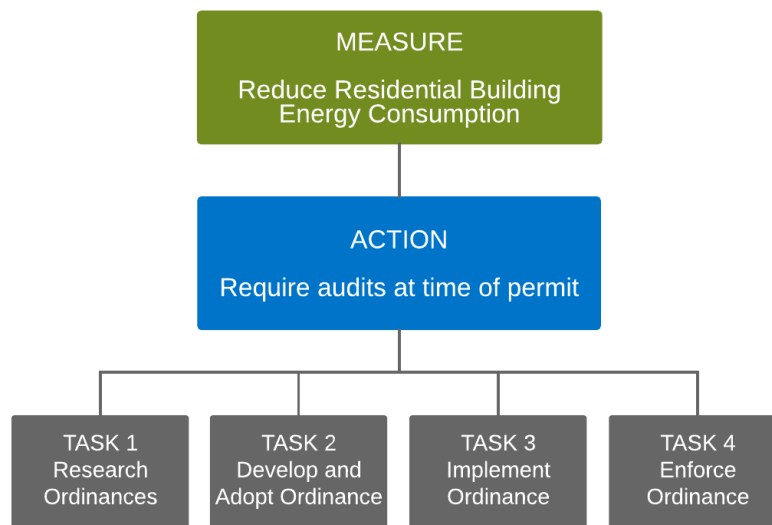
Figure 4 Process to develop CAP implementation costs



3.1 Identify anticipated CAP tasks

The first step in the process is to identify a set of tasks that represent the expected workload to implement the measures and actions of the CAP. The organizational structure of CAPs varies, but CAPs generally include measures, which are high-level goals. Each measure includes a series of actions that the local jurisdiction will implement to directly reduce GHG emissions through changes to government facilities and operations or through policies or programs that affect residents and businesses. In turn, each action has associated tasks, which can be specified in the CAP document or implementation plan (Figure 5). Some measures also have supporting efforts, which indirectly help achieve the reductions associated with a measure (not shown in Figure 5). Tasks associated with supporting efforts can also be part of the ICA. Implementation costs are generally estimated for actions, which can be aggregated by measure.

Figure 5 Identify CAP implementation tasks



CAP actions and supporting efforts generally have a timeframe for completion. This can help staff to sequence tasks in a way that represents the likely phasing of work to complete CAP activities, which can allow for a more accurate estimate of costs.

3.2 Identify anticipated staffing and non-staffing needs

Based on the anticipated tasks, local jurisdiction staff must estimate the need for staffing, consultants, capital expenditures, and supplies and materials. Because some activities and programs included in a CAP have not been implemented previously, it can be difficult to assess staffing and other expenditure needs. Local jurisdiction staff can look to analogous tasks and programs as examples to estimate costs.

3.3 Estimate CAP implementation costs

After identifying anticipated staffing and non-staffing needs to implement the CAP, the next step is to assign a cost. CAP implementation costs associated with the anticipated tasks are based on data collected and provided by local jurisdiction staff. Section 4 describes the potential costs to be included in the analysis in more detail.

3.4 Data collection

While data collection can vary by project, this section describes an illustrative process. Use of a standardized data collection tool can facilitate the data collection process and ensure data consistency. This is beneficial in a process where numerous staff from different departments will likely be providing input. The following sections summarize the data typically needed to complete an ICA.

3.4.1 Details about CAP measures and actions

The first step is to collect information on measures and actions necessary to evaluate and present results. The list of CAP measures and actions is typically provided in a draft CAP. More detailed information can also be provided in the implementation section of a CAP or a standalone implementation plan. It is possible that local jurisdiction staff may need to provide additional information to what is provided in a CAP. Providing this information for all CAP measures and actions requires a relatively low level of effort and can be completed by a single staff person, depending on the CAP development process. The following information is needed at this point in the data collection process:

- responsible/lead department(s);
- collaborating department(s);
- implementation timeline;
- implementation action type;
- program status;
- funding status; and
- funding source.

Detail about these categories is provided in Sections 4 and 5.

3.4.2 Staff positions and hourly rates

A list of all staff positions that will be implementing CAP activities and their fully-burdened hourly rates is required to estimate personnel costs. Section 4.1.2 discusses the salary and personnel information needed. Staff time needed to complete this part of the process is relatively low.

3.4.3 Level of effort and cost data to implement CAP activities

The next step in the data collection process is for city staff to provide estimated hours required to implement CAP activities and associated non-personnel costs. A data collection tool can include the specific variables a local jurisdiction would like to highlight. In general, a tool would collect enough data to calculate the costs to implement all CAP actions, supporting measures, and other CAP implementation activities, such as completing GHG inventories and CAP monitoring reports. The number of hours required to complete CAP implementation activities is one of the main inputs for an ICA, along with other expenditure categories, like capital, consultants, and supplies and materials.

Because detailed knowledge of the activities and level of effort necessary to implement specific CAP actions generally resides within each department or division within a local jurisdiction, collecting data separately from each department or division can be an efficient way to collect hours and cost data. A data collection tool can be customized to include only the CAP measures and actions relevant to each organizational unit.

Because CAP ICAs typically cover the first five years of CAP implementation and numerous staff positions are included, the total amount of data needed at this point in the process can require a medium to high level of effort from staff.

Table 1 provides an illustrative example of a data collection tool that focuses on staffing effort and cost. Additional columns could be added to account for multiple years, additional departments and positions, and to collect costs for non-staffing budget categories, such as capital and consultant costs.

Table 1 Example data collection tool

					Staffing Effort (Hours)			
					Department A			
	Timing	Activity Type	Program Status	Funding Status	Position 1 (\$75/hr)	Position 2 (\$100/hr)	Position 3 (\$125/hr)	Totals
Transportation Strategy								
CAP Measure T-1								
CAP Action T-1.1	Short-term	Education & Outreach	New & Expanded	Funded	80	40	16	136
CAP Action T-1.2	Medium-Term	Ordinance	Existing	Funded	100	36	8	144
CAP Action T-1.3	Long-Term	CAP Administration	New & Expanded	Unfunded	40	10	0	50
Total Hours					220	86	24	330
Total Cost					\$16,500	\$8,600	\$3,000	\$28,100

3.4.4 Quality control and data validation

Quality control and data validation can occur at several stages of the ICA process. The first validation can occur after hours and cost data are entered into the collection tools by staff. Once the data are compiled and analyzed, high-level results can be developed and provided to staff for review. At this point, staff can perform an internal quality control check and review preliminary results with department managers and staff. Subsequent data checks can occur when draft and final versions of the ICA report are completed.

3.5 Level of effort to complete ICA

The scope and effort required to complete an ICA can vary depending on several factors, including the number and types of costs included, timeframe analyzed, whether implementation actions are already developed, number of implementation tasks, and number of staff positions included in the analysis. These factors determine the total amount of data to be analyzed, therefore informing the level of effort. In general, the broader the scope of the analysis, the higher the level of staff involvement required. Sections 4 and 5 discuss the costs and other considerations of ICAs.

4. Which CAP implementation costs to include

The type and number of costs evaluated depend on the objectives of the analysis. For example, if a local jurisdiction is primarily concerned with the staffing impacts of implementing CAP measures, then focusing on salary and benefit costs would be sufficient. If a local jurisdiction wanted to know the total cost to implement a CAP, then evaluating all expenditure categories would yield a more complete estimate. Jurisdiction staff typically provide the necessary data to evaluate CAP implementation costs.

4.1 Expenditure categories

Each local jurisdiction may have its own expenditure categories and system of grouping expenditures, but general categories include capital, salary and benefits, consultants, and supplies and materials. The expenditure categories used to collect and analyze cost data can be determined by local jurisdiction preferences and general budgeting conventions.

4.1.1 Capital

Capital expenditures by local jurisdictions are typically for projects and programs related to local jurisdictional operations, such as installing solar photovoltaics (PV) on municipal facilities, but can also include public works projects that affect the broader community, such as bike lane construction. Capital cost estimates can include an annual increase to account for inflation.

4.1.2 Salary and benefits

The salary and benefits category represents the personnel costs to implement CAP activities. Salary and benefit costs are calculated using estimated hours for each staff position that would be required to implement CAP activities and the fully-burdened hourly rate, which typically includes current base salary, benefits (e.g., healthcare and retirement), and any other associated overhead costs (e.g., equipment). Some jurisdictions have positions (e.g., permitting and inspection) that have rates designed to recoup other costs. In such cases, local jurisdictions can determine the most appropriate rate to use.

The analysis can include an annual increase to hourly rates to reflect increasing personnel costs. The rate of increase can be based on a labor agreement or an anticipated or reasonably expected cost of living increase. Using constant hourly rates across the analysis period could add uncertainty, depending on the level of future increases and the proportion of total implementation costs represented by salary and benefits. For ICAs that only evaluate personnel costs, the effects of holding rates constant when actual rates increase across the analysis period would be more significant.

Staffing impact (FTE)

The number of hours estimated for salary and benefit costs can be used to develop an estimate of the staffing impacts that would result from the anticipated tasks related to each CAP measure. Staffing impacts are typically expressed in full-time equivalents (FTEs). To determine FTEs, the total number of hours is divided by the total work hours in a year (typically 2,080 hours), but this value can be customized to the number used by the local jurisdiction. It is also possible that local jurisdiction departments use a different number of hours to represent a full-time position or productive time; in such cases, one consideration is whether to use a common number of hours per year to create consistency across the analysis. More information about staffing impacts is presented in Sections 6.2.1 and 6.5.

4.1.3 Consultants

Local jurisdictions often hire external consultants to support CAP implementation activities. Costs associated with this expenditure category can occur in the early years—or “startup” phase—of the CAP for discrete short-term tasks, or for ongoing implementation support over a longer duration. Local jurisdictions may retain consultants during CAP implementation to develop ordinances, prepare environmental documents under the California Environmental Quality Act (CEQA), conduct transportation demand studies, analyze GHG emissions and CAP implementation activities to regularly monitor and report CAP progress, and other related tasks.

4.1.4 Materials and supplies

Many CAP activities require materials and supplies, such as brochures and meeting materials for outreach activities. Local jurisdiction staff are typically able to estimate the costs associated with these materials based on experience with other programs and planning efforts.

4.2 Other cost considerations

In addition to the ICA, other cost implications of CAP implementation activities can be considered when evaluating CAP measures.

4.2.1 Lost revenue

There are instances in which CAP measures result in lost revenue. For example, if a local jurisdiction waives solar PV permitting fees, the revenue that would have been realized for this activity would be lost; this is seen as a cost to the local jurisdiction. These costs can be difficult to estimate but can be acknowledged as part of the CAP ICA.

4.2.2 Operational efficiencies

It is possible that certain programs in the CAP could create operational efficiencies that could reduce internal costs. For example, a CEQA-qualified CAP could include a checklist to streamline the process for development projects to demonstrate their GHG reductions and/or consistency with the adopted CAP. While one purpose of streamlining is to reduce time and costs for the project developer, it is possible that the streamlined process could also reduce processing costs for the local jurisdiction. If there were a method for staff to estimate the potential cost reductions from future projects that might seek approval during the timeframe of the ICA (e.g., first five years of CAP implementation), these costs could be considered.

4.2.3 Ability to compete for grant funding

While the focus of the ICA is identifying the costs for implementing a CAP, local jurisdictions with CAPs may also have a competitive edge when applying for grant funding. It is difficult to quantify this benefit, but there are examples of grant programs requiring CAPs as eligibility requirements and/or referencing an adopted CAP in evaluation criteria. Examples include grant programs from the Greenhouse Gas Reduction Fund (GGRF), California Energy Commission’s Alternative and Renewable Fuel and Vehicle Technology program, and SANDAG’s grant programs.

SANDAG’s *TransNet* Smart Growth Incentive Program (SGIP) and Active Transportation Grant Program (ATGP) have been modified to require both a locally adopted CAP and complete streets policy as prerequisites to be eligible for grant funding. In addition, the evaluation criteria have been updated to provide greater weight to project proposals that directly reduce GHG emissions.

Grant funding could reduce implementation costs related to CAP measures. While it may not be possible to project future levels of funding, it can be acknowledged that a jurisdiction with a locally adopted CAP is eligible for such funding.

5. Considerations for evaluating CAP implementation costs

This section discusses the following considerations for evaluating the costs associated with CAP implementation programs and activities:

- **Program status** – whether CAP programs already exist or will be part of an expanded or new effort;
- **Funding status** – whether CAP activities are already funded or if additional funding would be necessary;
- **Staff position status** – whether a position already exists or is new;
- **Total or incremental costs** – whether CAP activities would not have occurred without CAP adoption;
- **Funding source** – whether a funding source for existing, new, and expanded programs has been identified; and
- **Timeframe of analysis** – the number of years to be considered.

These considerations can be applied to activities to implement CAP actions and supporting efforts or the more detailed tasks required (Figure 5 in Section 3.1).

5.1 Program status

Program status describes whether a CAP program or related activity already exists, represents an additional cost due to a new or expanded effort, or is already completed. Distinguishing between existing, expanded, new, or completed activities helps determine the incremental cost impacts of the CAP.

Possible categories for program status are:

- **Existing** – Existing activities would have been implemented regardless of CAP adoption;
- **Expanded** – Expanded activities represent an increase to the level of activity of an existing program for the sole purpose of meeting GHG reduction targets in the CAP;
- **New** – New activities are those undertaken specifically to implement CAP measures. The combination of new and expanded activities constitutes the incremental activities associated with the CAP that would otherwise not have happened; and
- **Completed** – It is possible, depending on the baseline year, that activities included in the CAP as a GHG reduction measure are already completed by the date the CAP is adopted. For example, a CAP with a 2010 baseline that is adopted in 2016 could have completed activities between 2010 and 2016 that reduced emissions. Completed measures are likely to include actions focused on municipal facilities and operations, but could also include infrastructure projects like bike lanes, or similar projects to encourage multi-modal opportunities.

5.2 Staff position status

Similar to program status, position status can be used to determine the need for new staff positions to complete the anticipated activities in the CAP. Two position status designations can be used:

- **Existing positions** – These positions exist regardless of CAP adoption; and
- **New positions** – These positions are additional positions needed only to meet incremental workload due to CAP adoption. New staff positions would represent the “incremental staffing impact” of the CAP.

Total positions required—existing plus new positions—would represent the “total staffing impact” of the CAP.

5.3 Funding status

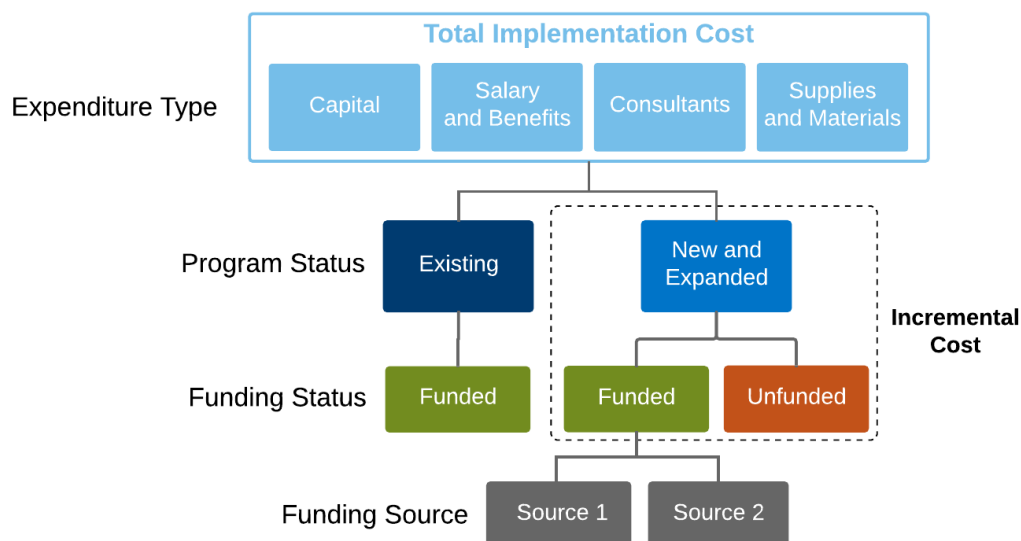
Funding status determines whether an activity is already funded or whether additional resources must be identified. This designation helps identify the incremental funding needs associated with CAP implementation. Possible categories for funding status are:

- **Funded** – Activities that have approved, committed funding from a specific source. Both existing and new and/or expanded activities could be funded; and
- **Unfunded** – Unfunded activities currently do not have approved funding from a specific source and are assumed to be unfunded because they represent additional activities and costs that are incremental to existing programs due to CAP adoption. Local jurisdiction staff and decision-makers may choose to focus on the unfunded portion of the CAP implementation costs, because these affect future budgeting and resource allocation decisions. It is likely that all existing programs are funded, though there is a possibility that certain programs that exist would need additional funding or funding for an extended period of time. These cases could be captured in the new and/or expanded categories to highlight incremental activity.

5.4 Total or incremental costs

A CAP ICA can estimate total costs, incremental costs, or both. As described above, whether an activity and its associated cost is incremental to the CAP is a function of program status. Total cost is determined by summing the cost of all activities by expenditure type. The proportion of the total activity that is associated with the new activities and the expanded portion of existing activities is considered incremental (Figure 6). Incremental activity costs can comprise funded and unfunded activities; this represents the total cost to implement activities that would not have occurred without CAP adoption. Costs associated with unfunded incremental activities in this example represent the amount of additional funding that would be necessary to complete activities that would only be undertaken because of the CAP. This amount could be referred to as the “incremental budget impact” of the CAP.

Figure 6 Framework for determining incremental costs



5.5 Funding sources

Another variable that can be considered is the funding source for CAP activities. For existing, funded activities, the funding source information likely is readily available. Staff and decision-makers may want to know potential funding sources for new and expanded activities, particularly for the subset of activities that are unfunded. Funding sources can include typical local jurisdiction budget sources (e.g., general fund, enterprise revenue, or fees and deposits) and external funding sources (e.g., grants or utility partnerships). The funding sources used to categorize unfunded activity costs are a preference of the local jurisdiction and can be determined based on their budget nomenclature and conventions.

As the CAP ICA is a snapshot based on the best available information at the time of the analysis, it is possible that funding sources could change over the implementation horizon of a CAP measure as new funding sources become available and/or existing funding sources are depleted or no longer available.

5.6 Timeframe of analysis

The number of years to evaluate in a CAP ICA depends on several factors, including the budget forecast cycle of a local jurisdiction and the implementation timeframe of CAP measures. Local governments in the San Diego region generally have budget forecast cycles of about five years, while many CAPs have implementation horizons of 20–25 years. Most jurisdictions in the San Diego region that have completed ICAs have included annual cost estimates for the first five fiscal years.

Because CAP implementation cost estimates are intended to inform a local jurisdiction's budgeting process, such analyses generally do not extend to the end year of the CAP.

CAP documents typically include an implementation framework that provides a timeframe in which each CAP measure or action will be completed. This information can help estimate the cost associated with CAP activities. CAP activities are anticipated to phase in and out during the cost analysis time horizon, so some activities may start and be completed before the end of the analysis horizon, while others may start in the analysis horizon but end in a year that is beyond the scope of the ICA.

6. Presenting the results

CAP ICA results can be presented in a variety of ways, ranging from a summary of results to a more detailed breakdown of costs. The way these results are presented is ultimately determined by the objectives of the local jurisdiction. This section presents illustrative examples of how to present implementation cost results.⁴

6.1 Overall Total and Annual Results

Total cost results can be presented as high-level totals or as more detailed tables and figures. Figure 7 presents high-level results from an illustrative CAP implementation cost estimate in the framework described in Section 5.4. This allows for consistency in presenting overall cost results in the same framework used to identify incremental costs (new and expanded activities). In this illustrative example, the incremental costs, or budget impact, due to CAP adoption is \$1,150,000, half of total costs. Of this amount, 50% is funded. The remaining 50% (\$575,000) is unfunded and represents the activities that would require additional resources to complete. Figure 7 also provides a possible framework for presenting costs in the report. Total costs are presented and then are broken down into incremental costs. To the extent that unfunded, new, and expanded programs are the ultimate focus of the analysis, these can be highlighted.

⁴ Note that values are rounded and may not sum to totals presented.

Figure 7 Total CAP implementation cost diagram

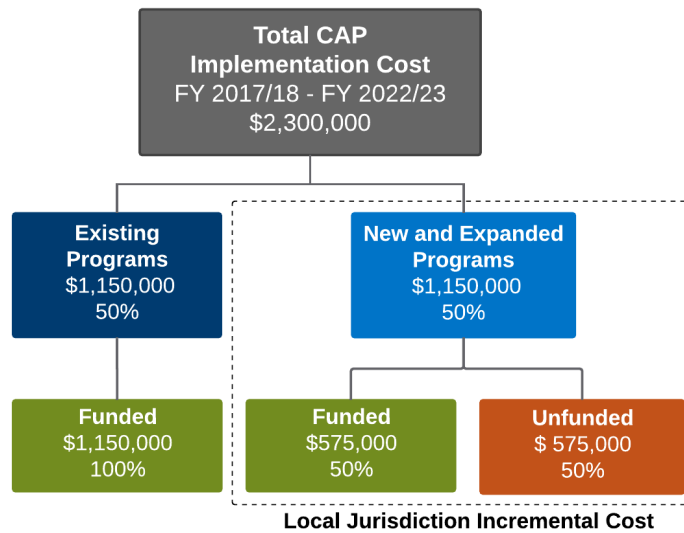
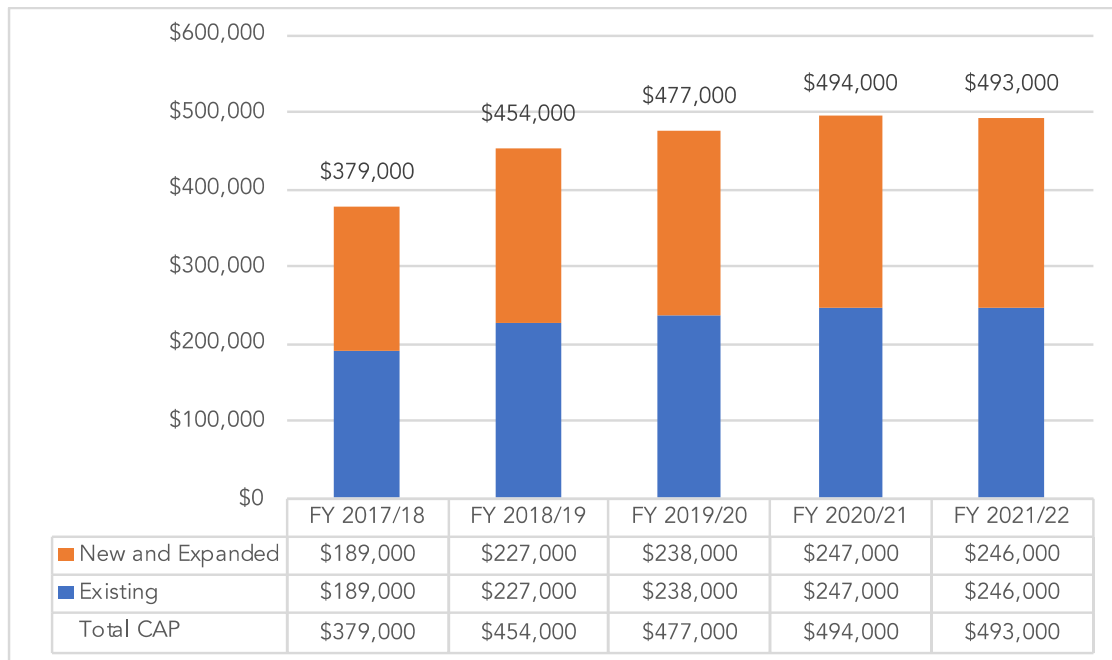


Figure 8 is an example of how to present annual costs by program status. In this example, costs rise slowly in the first several years before leveling off just under \$500,000, and half of the total costs are associated with existing programs.

Figure 8 Annual CAP implementation cost by program status



6.2 By expenditure type

Table 2 is an example of how to present total costs by expenditure type and fiscal year.

Table 2 Annual total CAP implementation cost by expenditure category

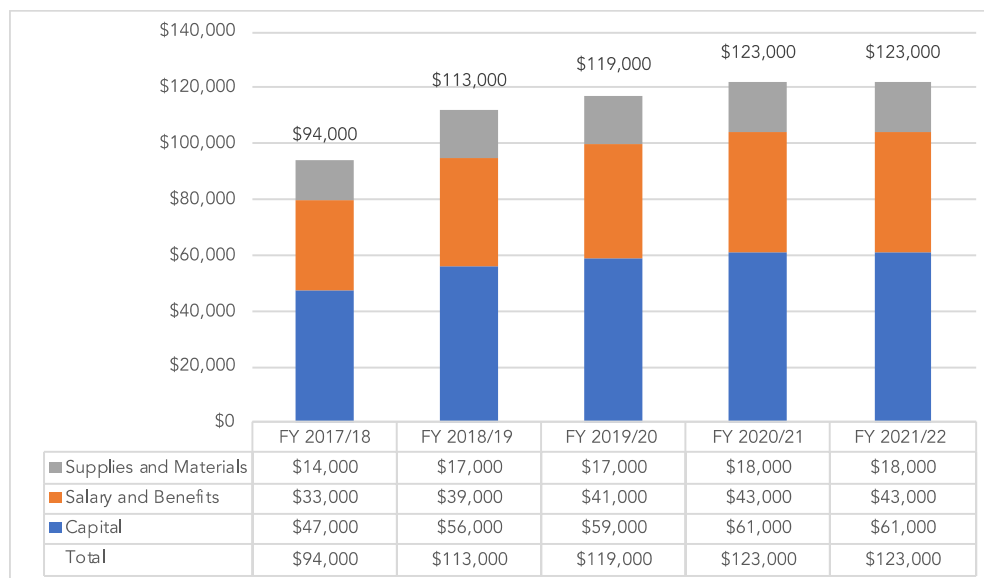
Expenditure Category	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Capital	\$189,000	\$227,000	\$238,000	\$247,000	\$246,000	\$1,150,000	50%
Salary and Benefits	\$132,000	\$159,000	\$167,000	\$173,000	\$172,000	\$805,000	35%
Supplies and Materials	\$56,000	\$68,000	\$71,000	\$74,000	\$74,000	\$345,000	15%
Total	\$379,000	\$454,000	\$477,000	\$494,000	\$493,000	\$2,300,000	100%

Table 3 presents annual incremental unfunded costs by expenditure category, and Figure 9 presents the same information in a bar chart format.

Table 3 Annual incremental unfunded CAP implementation costs by expenditure category

Expenditure Category	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Capital	\$47,000	\$56,000	\$59,000	\$61,000	\$61,000	\$287,000	50%
Salary and Benefits	\$33,000	\$39,000	\$41,000	\$43,000	\$43,000	\$201,000	35%
Supplies and Materials	\$14,000	\$17,000	\$17,000	\$18,000	\$18,000	\$86,000	15%
Total	\$94,000	\$113,000	\$119,000	\$123,000	\$123,000	\$575,000	100%

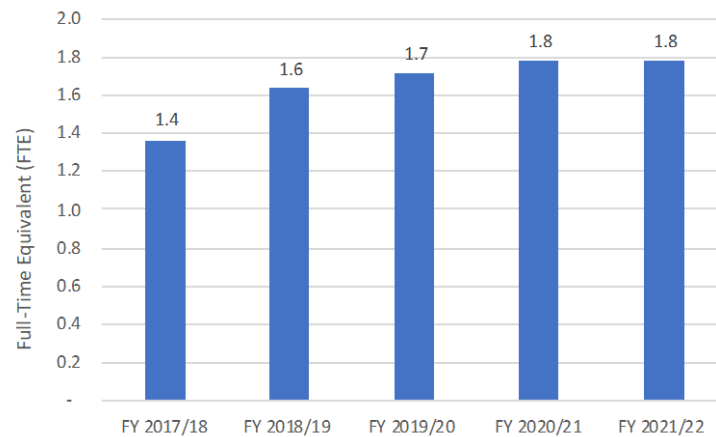
Figure 9 Annual incremental unfunded CAP implementation costs by expenditure category



6.2.1 Staffing impacts (FTE)

In addition to personnel costs, staffing impacts can be presented in terms of FTE. Figure 10 shows annual number of staff positions that would be needed to implement the anticipated level of activity in the CAP in the first five-year period. In this illustrative example, staffing impacts increase to 1.8 FTE positions by the fourth year and remain at that level in the final year.

Figure 10 Annual staffing impact (FTE)



6.3 By CAP measure

It is possible to present results by CAP implementation action, but depending on the number of actions, this can be problematic. Some CAPs have more than 50 actions, so it may be necessary to present results for a subset of total actions (e.g., by CAP measure).

Table 4 is an example that shows total CAP implementation costs for CAP measures by year. The table is sorted to present the highest total cost CAP measure at the top and lowest cost CAP measure at the bottom; it also uses a heat map approach to show higher costs in red and lower costs in green. This can help readers quickly identify ranges, particularly in tables with many values.

Table 4 Annual total CAP implementation costs by CAP measure

CAP Measure	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Measure 1	\$132,000	\$159,000	\$167,000	\$173,000	\$172,000	\$805,000	35%
Measure 2	\$79,000	\$95,000	\$100,000	\$103,000	\$103,000	\$483,000	21%
Measure 3	\$68,000	\$81,000	\$85,000	\$89,000	\$88,000	\$414,000	18%
Measure 4	\$37,000	\$45,000	\$47,000	\$49,000	\$49,000	\$230,000	10%
Measure 5	\$18,000	\$22,000	\$23,000	\$24,000	\$24,000	\$115,000	5%
Measure 6	\$15,000	\$18,000	\$19,000	\$19,000	\$19,000	\$92,000	4%
Measure 7	\$11,000	\$13,000	\$14,000	\$14,000	\$14,000	\$69,000	3%
Measure 8	\$7,000	\$9,000	\$9,000	\$9,000	\$9,000	\$46,000	2%
Measure 9	\$5,000	\$6,000	\$6,000	\$6,000	\$6,000	\$32,000	1%
Measure 10	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$13,000	1%
Total	\$379,000	\$454,000	\$477,000	\$494,000	\$493,000	\$2,300,000	100%

Table 5 presents costs by CAP measure, but is limited to incremental, unfunded activity costs. This table provides another example of how data could be presented.

Table 5 Annual incremental unfunded CAP implementation costs by CAP measure

CAP Measure	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Measure 1	\$33,000	\$39,000	\$41,000	\$43,000	\$43,000	\$201,000	35%
Measure 2	\$19,000	\$23,000	\$25,000	\$25,000	\$25,000	\$120,000	21%
Measure 3	\$17,000	\$20,000	\$21,000	\$22,000	\$22,000	\$103,000	18%
Measure 4	\$9,000	\$11,000	\$11,000	\$12,000	\$12,000	\$57,000	10%
Measure 5	\$4,000	\$5,000	\$5,000	\$6,000	\$6,000	\$28,000	5%
Measure 6	\$3,000	\$4,000	\$4,000	\$4,000	\$4,000	\$23,000	4%
Measure 7	\$2,000	\$3,000	\$3,000	\$3,000	\$3,000	\$17,000	3%
Measure 8	\$1,000	\$2,000	\$2,000	\$2,000	\$2,000	\$11,000	2%
Measure 9	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$8,000	1%
Measure 10	\$0	\$0	\$0	\$0	\$0	\$3,000	1%
Total	\$94,000	\$113,000	\$119,000	\$123,000	\$123,000	\$575,000	100%

6.4 By department

Presenting implementation cost results by local jurisdiction department and division can help staff and decision-makers understand the distribution of cost impacts across the agency. Table 6 presents total costs by department for each fiscal year. In this example, Department 1 would incur the highest costs over the five years of the ICA.

Table 6 Annual total CAP implementation cost by department

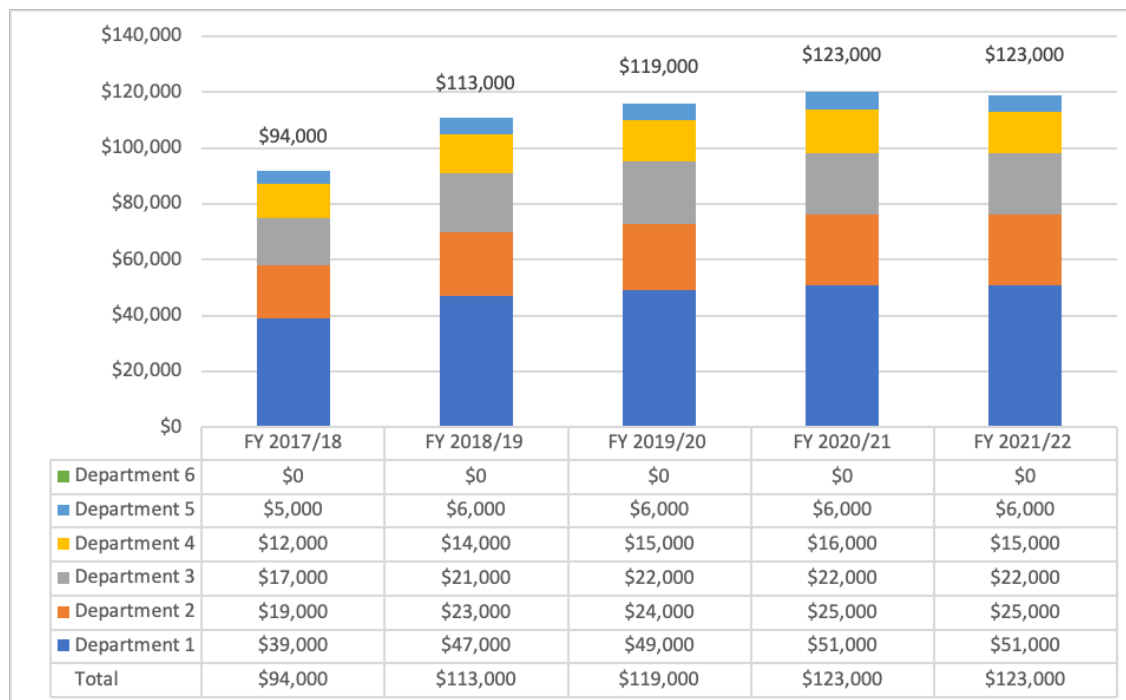
Department	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Department 1	\$179,000	\$192,000	\$197,000	\$200,000	\$201,000	\$970,000	42%
Department 2	\$97,000	\$97,000	\$97,000	\$96,000	\$97,000	\$485,000	21%
Department 3	\$0	\$86,000	\$98,000	\$114,000	\$105,000	\$404,000	18%
Department 4	\$51,000	\$58,000	\$63,000	\$63,000	\$63,000	\$301,000	13%
Department 5	\$11,000	\$15,000	\$26,000	\$33,000	\$33,000	\$120,000	5%
Department 6	\$1,000	\$4,000	\$4,000	\$4,000	\$4,000	\$18,000	1%
Total	\$341,000	\$453,000	\$486,000	\$511,000	\$506,000	\$2,300,000	100%

Table 7 presents the annual incremental unfunded costs. This could help staff and decision-makers understand the amount and distribution of the incremental budgetary impact to a local jurisdiction, as well as to each department. Figure 11 presents the same information in a bar chart format.

Table 7 Annual incremental unfunded CAP implementation costs by department

Department	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Department 1	\$39,000	\$47,000	\$49,000	\$51,000	\$51,000	\$239,000	42%
Department 2	\$19,000	\$23,000	\$24,000	\$25,000	\$25,000	\$119,000	21%
Department 3	\$17,000	\$21,000	\$22,000	\$22,000	\$22,000	\$106,000	19%
Department 4	\$12,000	\$14,000	\$15,000	\$16,000	\$15,000	\$74,000	13%
Department 5	\$5,000	\$6,000	\$6,000	\$6,000	\$6,000	\$31,000	5%
Department 6	\$0	\$0	\$0	\$0	\$0	\$4,000	1%
Total	\$94,000	\$113,000	\$119,000	\$123,000	\$123,000	\$575,000	100%

Figure 11 Annual incremental unfunded CAP implementation costs by department



6.5 By staff position

Providing results by staff position can help local jurisdiction staff and decision-makers understand the impact across the jurisdiction's workforce. Table 8 presents annual cost by staff positions that will implement CAP activities. In this illustrative example, the five staff positions with the highest cost related to CAP implementation would represent a majority of personnel costs.

Table 8 Annual cost by staff position

Position	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Position 9	\$27,000.00	\$32,000.00	\$33,000.00	\$35,000.00	\$35,000.00	\$161,000	20%
Position 10	\$27,000.00	\$31,000.00	\$35,000.00	\$34,000.00	\$34,000.00	\$161,000	20%
Position 4	\$20,000.00	\$24,000.00	\$25,000.00	\$26,000.00	\$26,000.00	\$121,000	15%
Position 8	\$15,000.00	\$18,000.00	\$19,000.00	\$20,000.00	\$20,000.00	\$93,000	12%
Position 1	\$13,000.00	\$16,000.00	\$17,000.00	\$17,000.00	\$17,000.00	\$81,000	10%
Position 5	\$10,000.00	\$12,000.00	\$12,000.00	\$13,000.00	\$13,000.00	\$60,000	7%
Position 7	\$10,000.00	\$12,000.00	\$12,000.00	\$13,000.00	\$13,000.00	\$60,000	7%
Position 6	\$7,000.00	\$8,000.00	\$8,000.00	\$9,000.00	\$9,000.00	\$40,000	5%
Position 3	\$3,000.00	\$4,000.00	\$4,000.00	\$4,000.00	\$4,000.00	\$20,000	2%
Position 2	\$1,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$2,000.00	\$8,000	1%
Total	\$133,000.00	\$159,000.00	\$167,000.00	\$173,000.00	\$173,000.00	\$805,000	100%

6.5.1 Staff impact (FTE) by position

Staff impact, measured in FTE, can be shown by position for each of the years included (Table 9). In this illustrative example, similar to the cost results above, Positions 9 and 10 have among the highest staffing impact. Some positions have a staffing impact of 0.0, such as Position 2. This signifies minimal involvement in CAP activities and an FTE of less than 0.1; it does not indicate that there is no staffing impact.

Table 9 Annual staff impact (FTE) by position

Position	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Position 10	0.3	0.4	0.4	0.4	0.4
Position 9	0.3	0.4	0.4	0.4	0.4
Position 7	0.2	0.2	0.2	0.2	0.2
Position 5	0.1	0.2	0.2	0.2	0.2
Position 1	0.1	0.1	0.1	0.1	0.1
Position 8	0.1	0.1	0.1	0.1	0.1
Position 4	0.1	0.1	0.1	0.1	0.1
Position 6	0.1	0.1	0.1	0.1	0.1
Position 3	0.0	0.1	0.1	0.1	0.1
Position 2	0.0	0.0	0.0	0.0	0.0
Total	1.4	1.6	1.7	1.8	1.8

6.6 Examples of ICA reports

Several examples of ICA reports are publicly available. These illustrate the range of possible approaches (Table 10).

- **City of San Marcos (2020)**⁵ – The City of San Marcos completed a CAP ICA report in 2020 as part of its CAP development adoption process. It estimated annual costs and staffing impacts (FTE) for the first five years of implementation. Non-staffing costs included capital, consultants, and materials and supplies. It distinguished between new and existing programs and also separately reported supporting efforts.
- **City of La Mesa (2018)**⁶ – The City of La Mesa completed a CAP ICA report in 2018 as part of its CAP adoption process. It estimated staffing costs and impact (FTE) for the first year of implementation and then aggregated costs for years two through five. It distinguished between new and existing programs and presented total and incremental costs. This analysis did not include other costs, such as capital and consulting services.
- **City of Solana Beach (2018)**⁷ – The City of Solana Beach completed a CAP ICA report in 2018 as part of its CAP adoption process. The report estimated annual staffing costs and impact (FTE) for the first five years of CAP implementation. This analysis did not distinguish between new and existing programs, present incremental costs, or include other costs like capital and consulting services.
- **County of San Diego (2017)**⁸ – The County of San Diego completed a CAP ICA in 2017. The analysis estimated annual costs and staffing impacts (FTE). It covered all budget categories (e.g., personnel, capital, supplies and materials) and distinguished between new and existing programs, positions, and funding sources. It included total and incremental costs. The County of San Diego CAP ICA is the most comprehensive ICA in the San Diego region.
- **City of Carlsbad (2016)**⁹ – The City of Carlsbad completed the first CAP ICA in the San Diego region in 2016. The analysis estimated incremental costs and staff impact (FTE) for the first year and then aggregated years two through five. Cost estimates included personnel, consultants, supplies/materials. No capital costs were included.

Table 10 Comparison of CAP ICAs in the San Diego region

Jurisdiction	Year Completed	Years Included	Scope	Cost Type
La Mesa	2018	Year 1 Aggregated Years 2-5	Staffing costs and impact (FTE)	Total and Incremental
Solana Beach	2018	Annual for Years 1-5	Staffing costs and impact (FTE)	Total
County of San Diego	2017	Annual for Years 1-6	Staffing costs and impact (FTE), capital, consultant, materials and supplies	Total and Incremental
Carlsbad	2016	Year 1 Aggregated Years 2-5	Staffing costs and impact (FTE), consultants, materials and supplies	Incremental

⁵ See Appendix E of the City of San Marcos Climate Action Plan. Available at san-marcos.net/home/showdocument?id=24738

⁶ See Appendix C of the La Mesa Climate Action Plan. Available at cityoflamesa.com/DocumentCenter/View/11008/LMCAP_CC03132018?bidId=

⁷ City of Solana Beach CAP ICA. Available at sandag.org/uploads/projectid/projectid_566_24845.pdf.

⁸ County of San Diego CAP ICA. Available at [sandiegocounty.gov/content/dam/sdc/pds/advance/cap/publicreviewdocuments/CAPfilespublicreview/Draft%20Climate%20Action%20Plan%20\(LOW%20RESOLUTION\).pdf](https://sandiegocounty.gov/content/dam/sdc/pds/advance/cap/publicreviewdocuments/CAPfilespublicreview/Draft%20Climate%20Action%20Plan%20(LOW%20RESOLUTION).pdf)

⁹ City of Carlsbad CAP ICA. Available at <http://edocs.carlsbadca.gov/HPRMWebDrawer/RecordHTML/433127>

7. Limitations of CAP ICAs

Any cost estimate has inherent limitations that create a level of uncertainty. While a CAP ICA is conducted using the best available information, data, and methods, the following limitations may exist.

7.1 CAP status

As described in Section 2.2, a CAP ICA can be done at different points in the climate action planning process. The status of the CAP, specifically whether or not it has been adopted, can affect the applicability of results. For example, an ICA could be based on measures, actions, and supporting efforts contained in a draft CAP. Because a draft CAP is subject to change, the final suite of measures and actions contained in an adopted CAP could have a different level of associated cost and staffing impact than those evaluated based on the draft CAP.

7.2 Preliminary estimate

The cost and staffing impact estimates included in a CAP ICA are typically considered preliminary estimates. Because there is limited information available about the specific tasks that would be required to implement CAP actions and supporting activities, the estimates presented in an ICA are based on reasonable assumptions about the work to be performed. Over time, the specific tasks required to implement final CAP measures will become clearer, and considerations for how to coordinate and sequence activities can be made, which may also affect the ultimate cost and effort to implement the final CAP.

7.3 Limited time horizon

Most CAP implementation cost estimates evaluate cost and staffing impacts for the first five years of CAP implementation and do not estimate costs to the local jurisdiction through the horizon year of the CAP. As a result, a CAP ICA is a snapshot over a limited time period, similar to the process local jurisdictions use to forecast expenditures for budgetary purposes. A local jurisdiction may have a program that extends past the budget forecast horizon, but only the costs included in the budget period are considered.

7.4 Limited scope of analysis

A CAP ICA can be limited, depending on its scope. The more limited the scope, the more limited the results. For example, an analysis that only estimates the staffing impacts would yield results limited to this expenditure category. While staffing impacts are necessary to determine CAP implementation costs, they are insufficient to determine the total cost, which would also need to include cost estimates for capital, consultants, and supplies and materials. Depending on the CAP, these categories can represent a large portion of total implementation costs. Also, if a cost estimate focuses only on total costs, it would not provide information on the incremental nature of those costs.

7.5 Cost savings not considered

CAP ICAs estimate the costs to the local jurisdiction to implement the measures included in the CAP. An ICA does not consider any potential cost savings that may result from those measures. For example, rooftop solar PV and energy efficiency retrofits at municipal facilities have an upfront cost but could result in a net savings over the project lifetime. A benefit-cost analysis would be required to estimate the net savings or costs that would accrue to the local jurisdiction for municipal projects (see Technical Appendix III – Benefit-Cost Analysis for CAP Measures).

7.6 GHG emissions not considered

CAP ICAs do not consider the GHG emissions associated with CAP measures. It is common for benefit-cost analyses to normalize cost across GHG emission reductions in a CAP; that is, to divide costs by GHG emissions to derive a cost per ton of carbon-dioxide equivalent (\$/MT CO₂e). This would be inappropriate in the case of an ICA because there is no way to correlate the amount of GHG reductions that would occur due to the specific expenditures estimated for a given time frame (e.g., five years). For example, it would not be accurate to divide costs for the first five years by the total GHG reductions that are expected by 2030, because there will be additional local jurisdiction costs associated with achieving those reductions in later years. GHG reductions are incorporated into a CAP benefit-cost analysis, which also includes data and results from an ICA, to determine CAP measure cost-effectiveness (\$/MT CO₂e; see Technical Appendix III – Benefit-Cost Analysis for CAP Measures).

8. Conclusion

This document provides guidance to estimate the cost to local jurisdictions of implementing CAP measures. Local decision-makers and community stakeholders often request this information during the CAP development and adoption process.

The information presented here summarizes the process and considerations for estimating budgetary impacts incurred by a local jurisdiction to implement CAP measures, both in terms of cost and staffing impact (or FTEs). The costs borne by residents and businesses who are affected by CAP measures are not considered in this report, but are addressed in Appendix III: Benefit-Cost Analysis of CAP Measures, which evaluates each CAP measure to determine whether there is a net benefit or cost to residents and businesses participating in or affected by CAP measures.

Cost and staffing impacts from a CAP ICA can be presented in numerous ways, depending on the amount of data collected for the cost estimate, including: CAP strategy; CAP measure; local jurisdiction department; staff position; program status (e.g., existing versus new); funding status; and expenditure category. Collecting sufficient information to present data related to all these factors requires significant staff time. In general, the amount of staff time required to collect data for a CAP ICA is proportional to the number of factors to be considered.

While this report focuses on the implementation costs incurred by local jurisdictions to implement CAP measures, there are many other factors to consider when evaluating GHG reduction measures, including local jurisdiction authority, GHG reduction potential, time required to implement, policy changes required, and staff commitment.

This document is for community-wide climate action planning under the SANDAG ReCAP only and may be updated to include new data collection and calculation methods in the future.