Climate Action Plan Implementation Cost Analysis

April 2018

Prepared for the San Diego Association of Governments (SANDAG)

Prepared by the Energy Policy Initiatives Center (EPIC)

About EPIC

The Energy Policy Initiatives Center (EPIC) is a non-profit research center of the USD School of Law that studies energy policy issues affecting California and the San Diego region. EPIC's mission is to increase awareness and understanding of energy- and climate-related policy issues by conducting research and analysis to inform decision makers and educate law students.

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1 Introduction

This document is Appendix 4 to the San Diego Association of Governments (SANDAG) Regional Framework for Climate Action Planning. It provides guidance on estimating the cost to local jurisdictions of implementing CAP measures. Local decision-makers and community stakeholders often request this information during the Climate Action Plan (CAP) development and adoption process.

The information presented in this report 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 report, but are addressed in Technical Appendix 3 – 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 report 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 Organization of Report

Section 2 of this report presents an overview of CAP implementation cost analysis (ICA), including a discussion of the connection with the benefit-cost analysis of CAP measures, and when to conduct such a cost analysis during the climate action planning cycle. 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. There are many variables to consider when evaluating costs, including 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; these considerations are discussed in Section 5. 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. Examples of illustrative results are used in Section 6 to demonstrate different approaches to present results. Section 7 discusses the inherent limitations to consider when undertaking a CAP ICA and a brief conclusion is provided in Section 8.

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 measures and associated activities in the CAP. It answers the question: **What is the budgetary impact to the local jurisdiction to implement CAP measures?** 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, developing programs, conducting education and outreach, conducting energy or water saving projects in local jurisdiction facilities, and building bike lanes (Figure 1, blue boxes). The second category of activities would include 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.

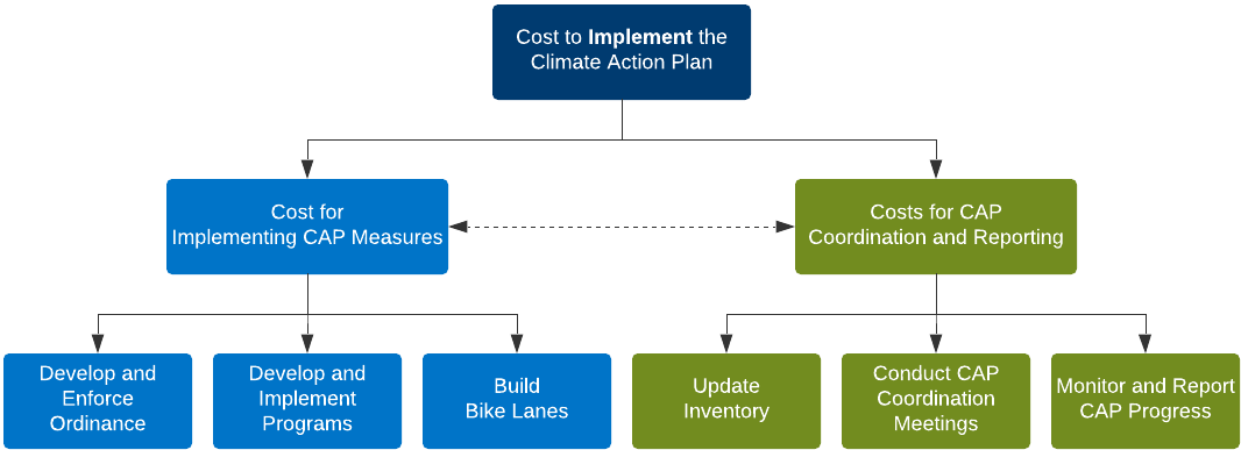


Figure 1. General Cost Types Included in Implementation Cost Analysis

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 also 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 a Technical Appendix 3: Benefit-Cost Analysis of CAP Measures[1], which combines the local jurisdiction's costs with those of residents and businesses to evaluate the overall cost-effectiveness of CAP measures and the impacts on those participating 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**);

[1] Appendix 3: Benefit-Cost Analysis of CAP Measures.

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

- 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.

Combining the Administrator, Participant, and Non-Participant Perspectives, the **Measure Perspective** results in comprehensive programmatic view of the CAP measures. More details on the framework and methods used in the benefit-cost analysis are provided in the Appendix 3: Benefit-Cost Analysis of CAP Measures.

The results of the CAP ICA feed into the benefit-cost analysis of CAP measures (Figure 2) and help to develop the Administrator perspective, which generally includes non-capital costs incurred to implement CAP measures, and the Participant perspective, which would be any capital costs related to CAP measures that affect municipal operations or local infrastructure (e.g., bike lanes).

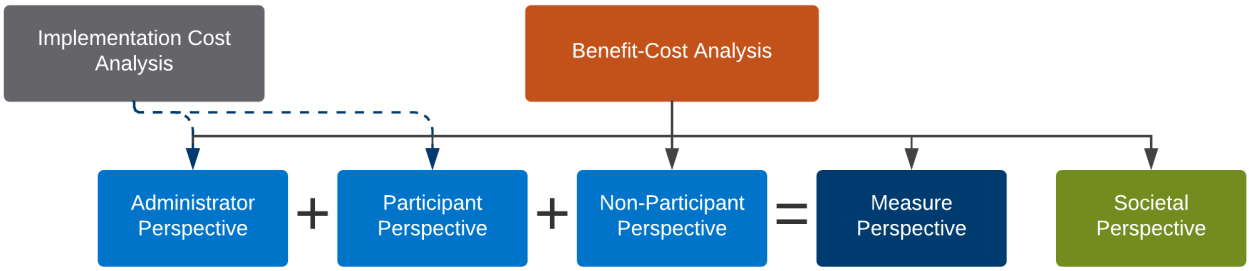


Figure 2. Perspectives for Benefit Cost Analysis and the Role of Implementation Costs

2.2 When to Conduct CAP Implementation Cost Analysis

Figure 3 presents the overall climate action planning cycle. A local jurisdiction may consider developing an ICA during one of several steps in the climate action planning process, including when GHG reduction estimates are being considered, 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.

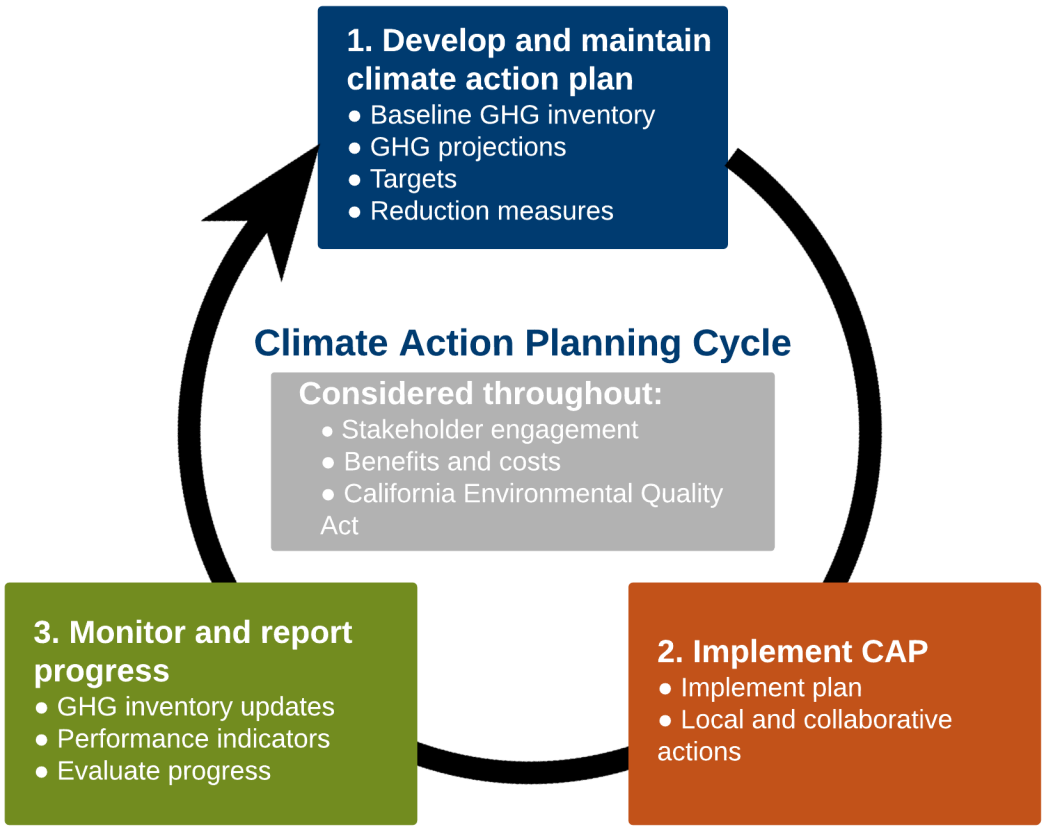


Figure 3. Climate Action Planning Cycle

2.2.1 GHG Reduction Estimates and CAP Development

During the CAP development process, local jurisdictions develop a list of potential GHG reduction measures to be evaluated for inclusion in the CAP. Understanding the cost to a local jurisdiction to implement a CAP measure can help inform this evaluation. Staff input and time is necessary to complete an ICA, which is a factor in determining whether to estimate implementation costs at this point in the planning cycle. 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 below.

Results from an ICA also can 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 also can occur is when a local government is updating a CAP. In addition to monitoring, some CAPs also call for regular CAP updates. For example, the County of San Diego CAP calls for updates every five years. 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. Most CAPs include a section on implementation, but more detailed and specific implementation plans are generally developed after the CAP is adopted. Similar to considering cost at the point of selecting GHG reduction measures to include in the CAP, 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.

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 cycle, 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 also can be completed at this point to provide staff and decision-makers with information about the fiscal impact of these changes.

2.3 Updating the Implementation Cost Analysis

The sections above describe the points at which a local jurisdiction can estimate CAP implementation costs throughout the climate planning cycle. Once an initial analysis is complete, either for CAP development or for an implementation plan, subsequent implementation cost analyses 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 marginal 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 costs out into the future.

[3] For more details on considerations for monitoring and reporting progress, see Appendix 6: 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 of implementation of the activities called for in CAP measures and actions. The general steps in the process are: 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 will briefly describe each step, including overall data collection.

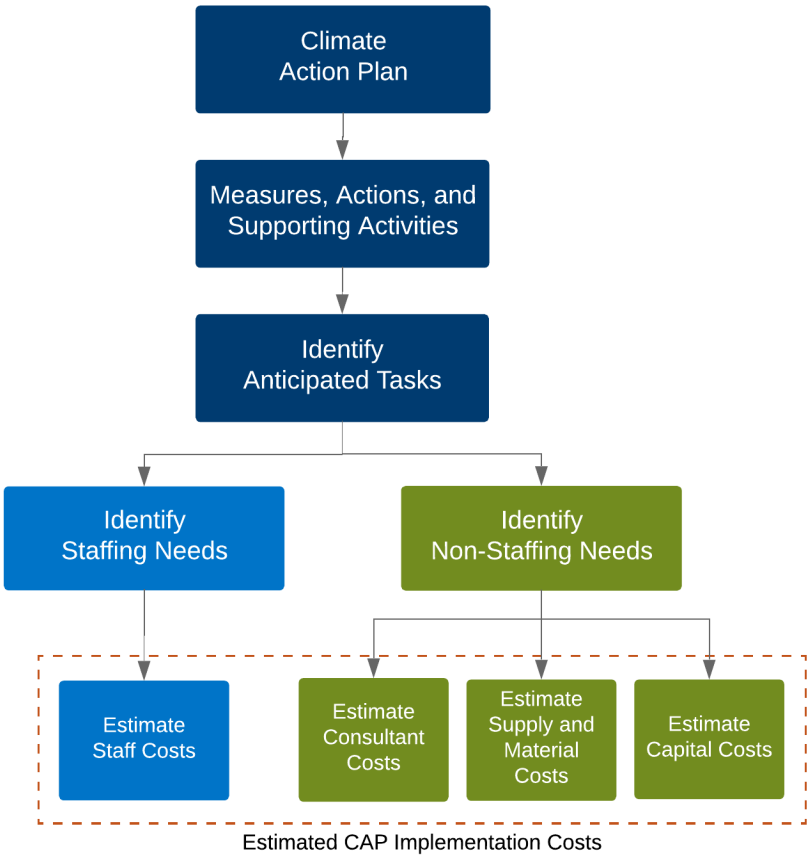


Figure 4. Process to Develop CAP Implementation Costs

3.1 Identify Anticipated Climate Action Plan 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. CAPs generally include measures, which are high-level goals. Each measure includes a series of actions that the local jurisdiction will implement to reduce GHG emissions directly through changes to government facilities and operations or to put in place policies or programs that affect residents and businesses. In turn, each action will have associated tasks, which can be specified in the CAP document or implementation plan (Figure 5). Some measures also have supporting activities, which indirectly help achieve the reductions associated with a measure but are not shown in Figure 5. Tasks associated with supporting measures can also be part of the ICA. Implementation costs can be estimated for the entire action, using the tasks as guides to determine the associated workload, or by task. Estimating costs by task requires a more detailed analysis and additional staff time.

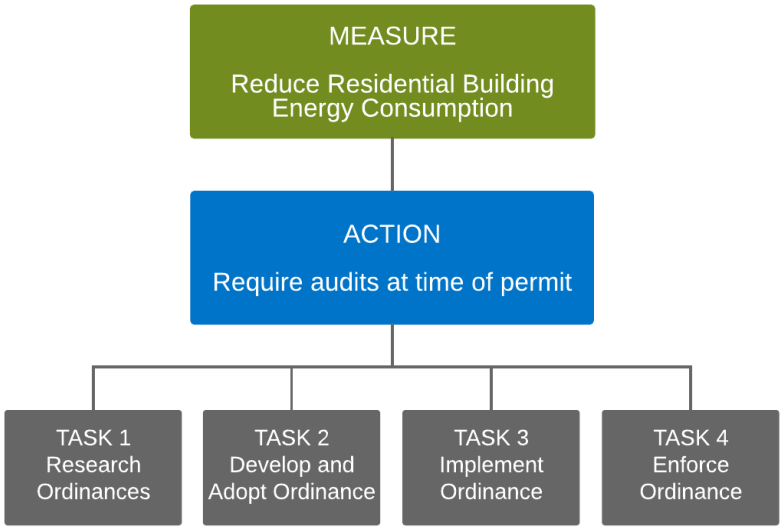


Figure 5. Identify CAP Implementation Tasks

CAP actions and supporting measures 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 staffing needs, consultant costs, capital costs, and supplies and materials needed. 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. The 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

The data collection process for the CAP ICA can be facilitated by use of a data collection tool. Because it is likely that numerous staff from different departments will be providing data, a standard template helps to ensure data consistency. 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 and supporting measures. The number of hours required to complete CAP implementation activities is one of the main inputs for a cost analysis, along with other expenditure categories like capital, consultants, and supplies and materials. The data collection tool also can collect information on other variables to allow results to be organized by:

- CAP strategy;
- CAP measure;
- CAP action, depending on the number of actions included;
- local jurisdiction department;

- local jurisdiction staff position;
- expenditure type;
- program status;
- position status; and
- funding source.

Detail about these categories is provided in Sections 4 and 5 below. Ultimately, the format of the data collection tool and the process to collect data depends on the preferences of the local jurisdiction, scope of analysis, and data needed. Table 1 provides an illustrative example of a data collection tool that focuses on staffing effort and cost. Additional rows 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

3.4.1 Staff Role in Data Collection

Data collection is a time-intensive process that requires local jurisdiction staff to obtain information across several departments and enter the data on level of effort (hours) and cost into the collection tool. Using the example provided in Table 1, staff would enter the hours required by each position. It may be necessary to customize the data collection tool to be specific for each participating department, depending on the scope of the analysis. Primary validation occurs after total estimated costs are collected. A second round of validation can occur when preliminary results are available for staff review.

4 Which CAP Implementation Costs to Include

The type and number of costs evaluated depend on the goals of the analysis. For example, if a local jurisdiction is primarily concerned with the staffing impacts of implementing CAP measures, then focusing only 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. Local staff typically develop the necessary data to evaluate CAP implementation costs. In general, the broader the scope of the analysis—that is, the more expenditure categories that are considered—the higher the level of staff involvement required.

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.

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 increase. Using constant hourly rates across the analysis period could add uncertainty, depending on the level of future increases. The effects would depend on the proportion of total implementation costs represented by salary and benefits. For implementation cost estimates that only evaluate personnel costs, the effects of holding rates constant when actual rates increased across the analysis period would be more significant.

4.1.2.1 Staffing Impact

The number of hours estimated for salary and benefit costs are 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 this case, one consideration is whether to use a common number of hours per year to create consistency across the analysis.

Staffing impacts can vary from one year to the next based on the level of work associated with CAP implementation tasks. In order to understand changes from one year to the next, staffing impact results

can be expressed as total or incremental positions. Total positions represent the total positions needed in a given year to implement identified CAP activities. Incremental positions are the additional positions needed each year and represent the difference between the total staffing needs in one year and the total needed in the previous year. Annual incremental values can be summed across years to determine the total additional positions that would be needed over the entire ICA horizon (e.g., five years). In the example provided in Table 2, the total number of staff positions needed would range from ten in the first fiscal year to 16 in the final fiscal year, demonstrating a need for six new positions over the five-year period. Based on the level of work in each year, Table 2 shows that two positions should be added in Year 2, three in Year 3, and one in Year 4.

Table 2. Example of Annual Incremental and Cumulative Total Staffing (FTE)

	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total
Incremental FTE	0	2	3	1	0	6
Total FTE	10	12	15	16	16	N/A

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 emissions and CAP progress to regularly monitor and report CAP progress, and other related tasks.

4.1.4 Materials & Supplies

Many CAP activities require materials and supplies. These can include 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

Other cost implications of CAP implementation activities should be considered.

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 considered as part of the CAP implementation cost estimate.

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 also could 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 in competing for grant funding. It is difficult to quantify the benefits of this ability to compete for grant funding, 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, described below.

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 should 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;
- **Position Status –** whether a position exists or is new;
- **Total or Incremental Costs –** whether CAP activities are incremental to the CAP and would not have occurred without CAP adoption;
- **Funding Source –** whether a funding source for existing and 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 above).

5.1 Program Status

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

- **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 could reduce emissions. Completed measures are likely to include actions focused on municipal facilities and operations, but also could include infrastructure projects, like bike lanes, or similar projects to encourage multi-modal opportunities.

5.1.1 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 work load 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.

5.2 Funding Status

Funding status determines whether an activity is already funded or whether additional resources must be identified. This designation helps to 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 can be funded.
- **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 because of the CAP. Local jurisdictional staff and decision-makers may choose to focus on the unfunded portion of the CAP implementation costs, since 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.

5.3 Total or Incremental Activity 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 activities (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.

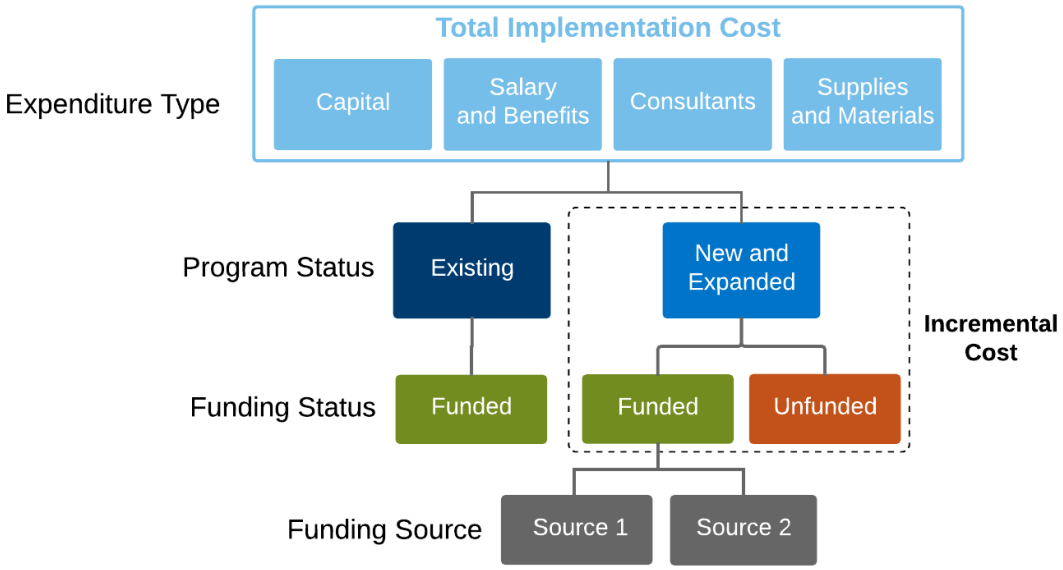


Figure 6. Framework for Determining Incremental Costs

5.4 Funding Source

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 go away.

5.5 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. A CAP ICA can include a range of years, typically up to five years, depending on the local jurisdiction. Some jurisdictions in the San Diego region have included annual cost estimates for the first five fiscal years while others have included the first year of implementation and then a combined total for Years 2-5.

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. Local governments generally have budget forecast cycles of about five years, while some CAPs have implementation horizons of 20-25 years.

CAP documents typically include an implementation framework that includes 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 will 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 a cost analysis.

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 local jurisdiction. This section presents illustrative examples of how to present implementation cost results.[4]

6.1 Total Cost

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 5.3. This allows for consistency in presenting overall cost results in the same framework used to identify incremental costs (new and the expanded portion of existing 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 would represent the activities that would require additional resources to complete, also known as the incremental budget impact of CAP implementation.

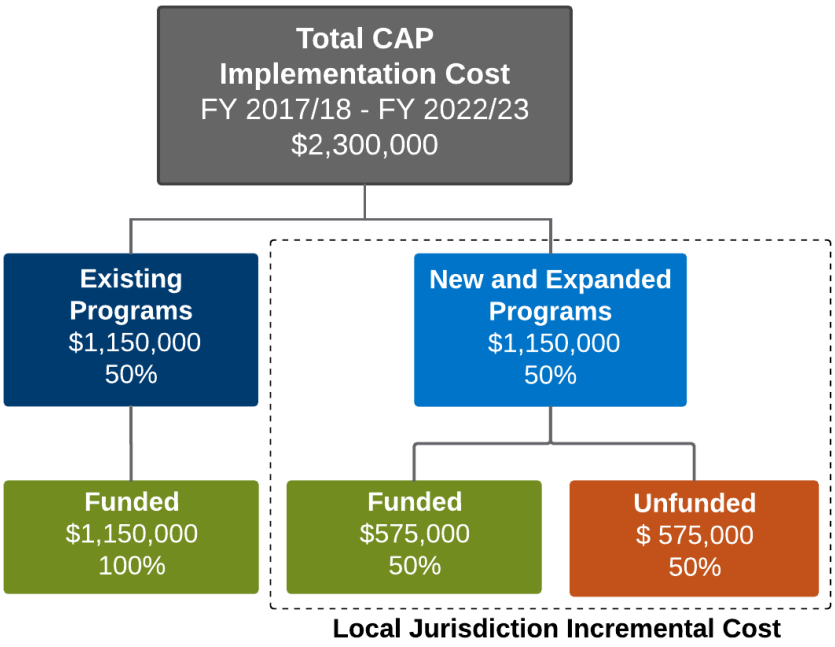


Figure 7. Total CAP Implementation Cost Diagram

Figure 7 also provides a possible framework for presenting costs in the report. First, 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.

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.

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

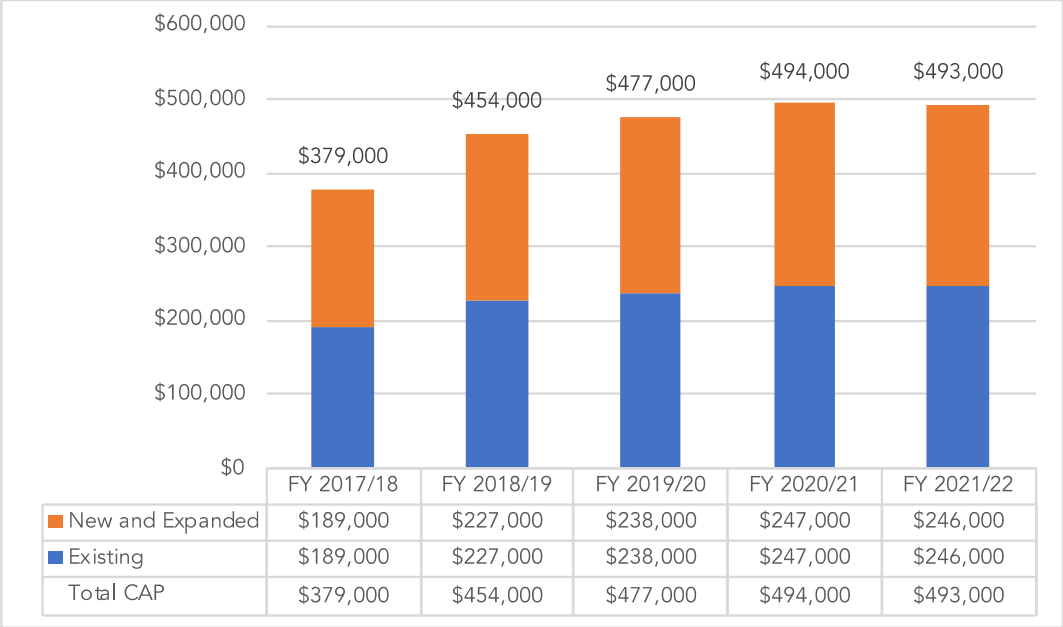


Figure 8. Annual CAP Implementation Cost by Program Status

Table 3 presents annual costs for both program and funding status in a tabular format. This is an example of detailed results that include several aspects of the analysis in one table.

Table 3. Cost to Local Jurisdiction to Implement CAP Measures by Program and Funding Status

	Existing Activities	New and Expanded Activities			
	Funded	Funded	Unfunded	New and Expanded Total	CAP Total
FY 2017/18	$189,000	$94,000	$94,000	$189,000	$379,000
FY 2018/19	$227,000	$113,000	$113,000	$227,000	$454,000
FY 2019/20	$238,000	$119,000	$119,000	$238,000	$477,000
FY 2020/21	$247,000	$123,000	$123,000	$247,000	$494,000
FY 2021/22	$246,000	$123,000	$123,000	$246,000	$493,000
Total	$1,150,000	$575,000	$575,000	$1,150,000	$2,300,000
% of Cap Total	*50%*	*25%*	*25%*	*50%*	*100%*

6.2 By CAP Strategy

CAP implementation costs can also be organized by CAP strategy. This provides the broadest view of CAP-related costs and can be compared to GHG emissions categories to the extent that they match. Table 4 presents total cost results in a tabular format for each fiscal year, and Figure 9 presents the same information, but in a bar chart.

Table 4. Annual CAP Implementation Costs by CAP Strategy

Strategy	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22	Total	% of Total
Energy	$189,000	$227,000	$238,000	$247,000	$246,000	$1,150,000	50%
Transportation	$132,000	$159,000	$167,000	$173,000	$172,000	$805,000	35%
Solid Waste	$37,000	$45,000	$47,000	$49,000	$49,000	$230,000	10%
Water	$18,000	$22,000	$23,000	$24,000	$24,000	$115,000	5%
Total	$379,000	$454,000	$477,000	$494,000	$493,000	$2,300,000	100%

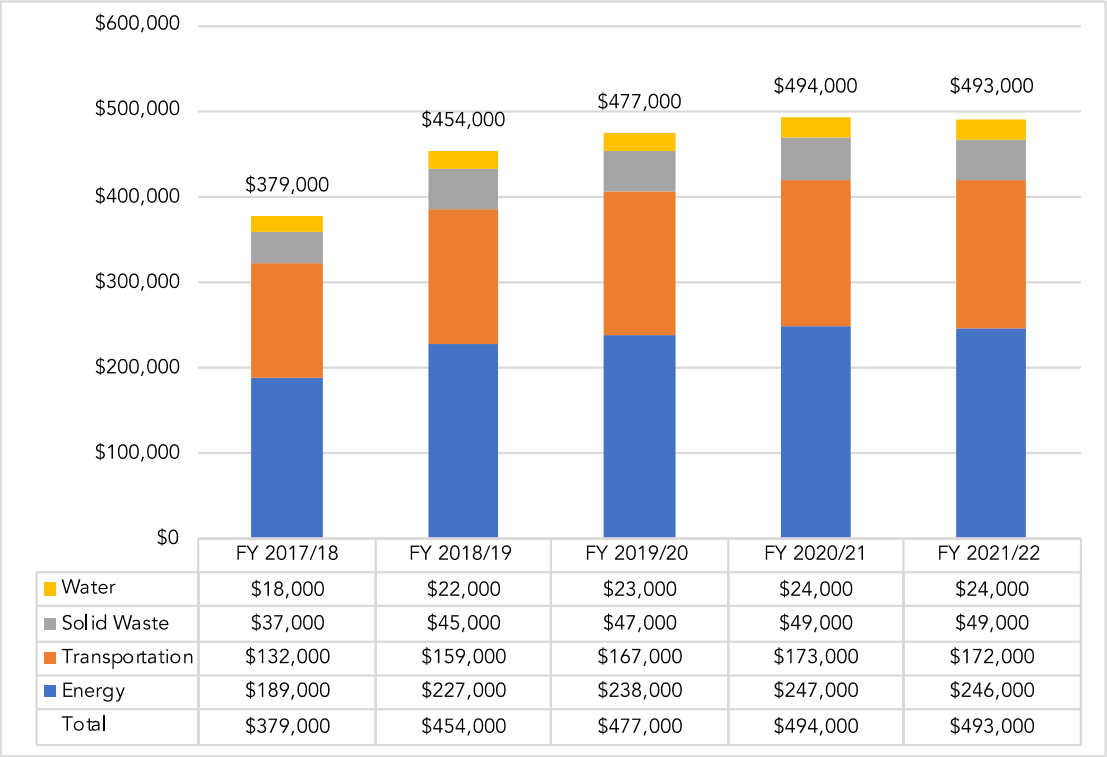


Figure 9. Total Implementation Cost by CAP Strategy

6.3 By CAP Measure

Presenting results by CAP measure adds an additional layer of detail beyond presenting results by CAP strategy. It is possible to present results by CAP action, which is the next most detailed view of the CAP, but depending on the number of actions, this can be problematic. Some CAPs have more than 50 actions, which may not be feasible to present.

Table 5 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.

Table 5. 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 6, again, presents costs by CAP measure, but is limited to incremental, unfunded activity costs.

Table 6. 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 can help staff and decision-makers understand the distribution of cost impacts across the agency. Table 7 presents total costs by department for each fiscal year.

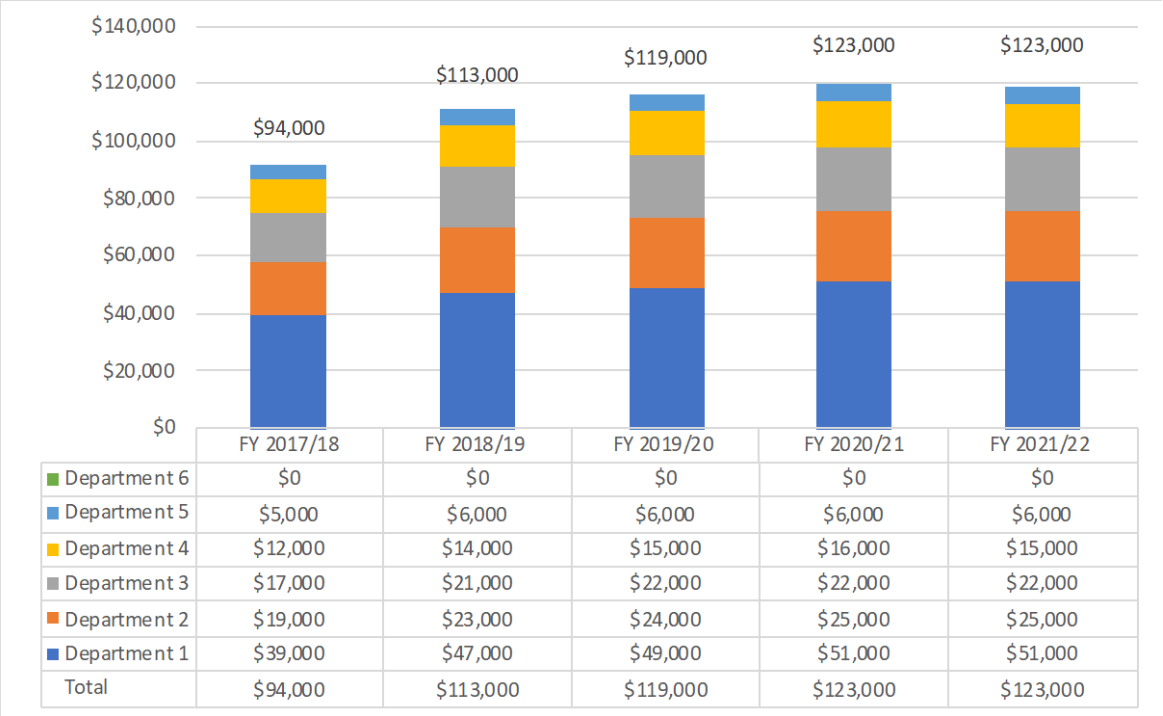
Table 7. Annual Total CAP Implementation Cost by Department

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 8 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 10 presents the same information in a bar chart format.

Table 8. 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%



	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Department 6	$0	$0	$0	$0	$0
Department 5	$5,000	$6,000	$6,000	$6,000	$6,000
Department 4	$12,000	$14,000	$15,000	$16,000	$15,000
Department 3	$17,000	$21,000	$22,000	$22,000	$22,000
Department 2	$19,000	$23,000	$24,000	$25,000	$25,000
Department 1	$39,000	$47,000	$49,000	$51,000	$51,000
Total	$94,000	$113,000	$119,000	$123,000	$123,000

Figure 10. Annual Incremental Unfunded CAP Implementation Costs by Department

6.5 By Expenditure Type

Table 9 presents total costs by expenditure type by fiscal year.

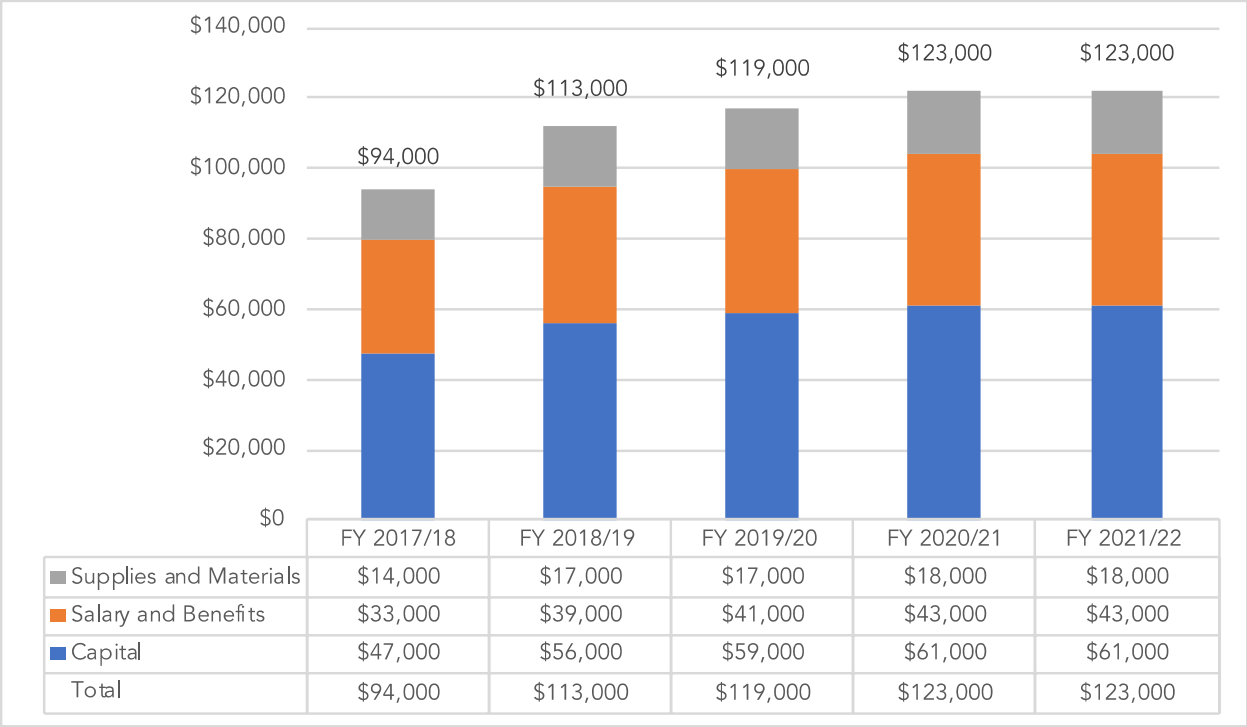
Table 9. Annual Total CAP Implementation Cost by Expenditure Category

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 10 presents annual incremental unfunded costs by expenditure category, and Figure 11 presents the same information in a bar chart format.

Table 10. 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%



	FY 2017/18	FY 2018/19	FY 2019/20	FY 2020/21	FY 2021/22
Supplies and Materials	$14,000	$17,000	$17,000	$18,000	$18,000
Salary and Benefits	$33,000	$39,000	$41,000	$43,000	$43,000
Capital	$47,000	$56,000	$59,000	$61,000	$61,000
Total	$94,000	$113,000	$119,000	$123,000	$123,000

Figure 11. Annual Incremental Unfunded CAP Implementation Costs by Expenditure Category

6.6 Staffing Impacts

As noted above, staffing impacts can be presented as a cumulative number of positions needed to implement CAP activities or the annual additions required to reach the total staffing levels required. Figure 12 shows total annual staffing impact by position status. It shows the total number of staff positions that would be needed to implement the anticipated level of activity in the CAP. In this example, staffing impacts increase to eight FTE positions by the fourth year and remain at that level for the final year. Because the values presented are cumulative totals, it would not be appropriate to sum them. Instead, the eight FTEs required in the fifth year represent the total number of staff positions that would be needed to complete CAP implementation activities.

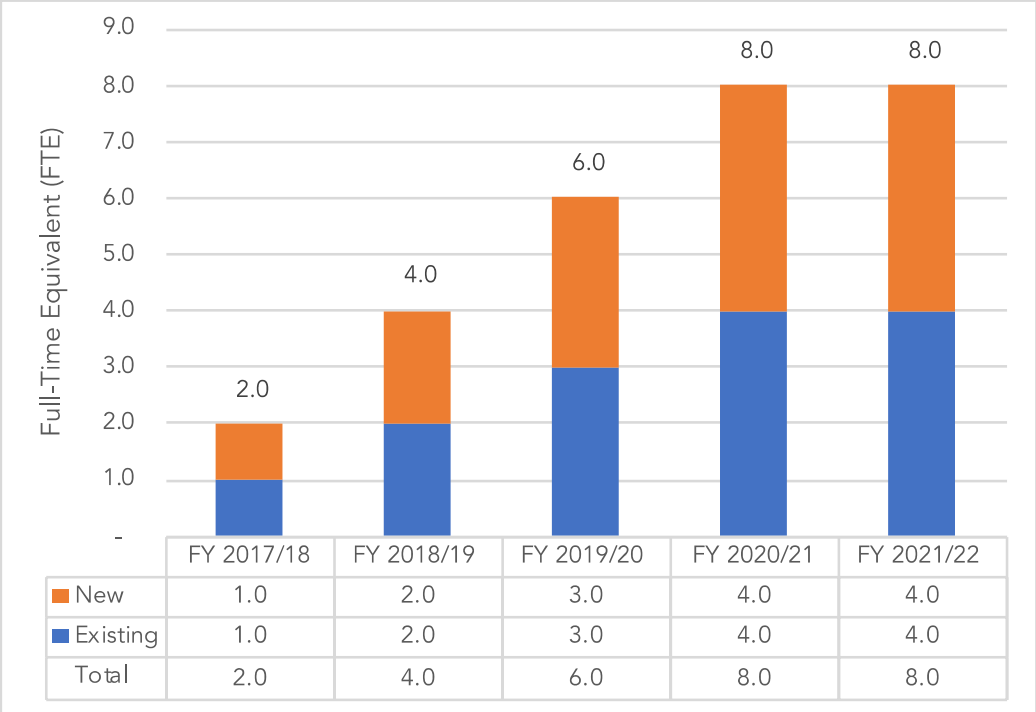


Figure 12. Cumulative Staff Impact by Position Status

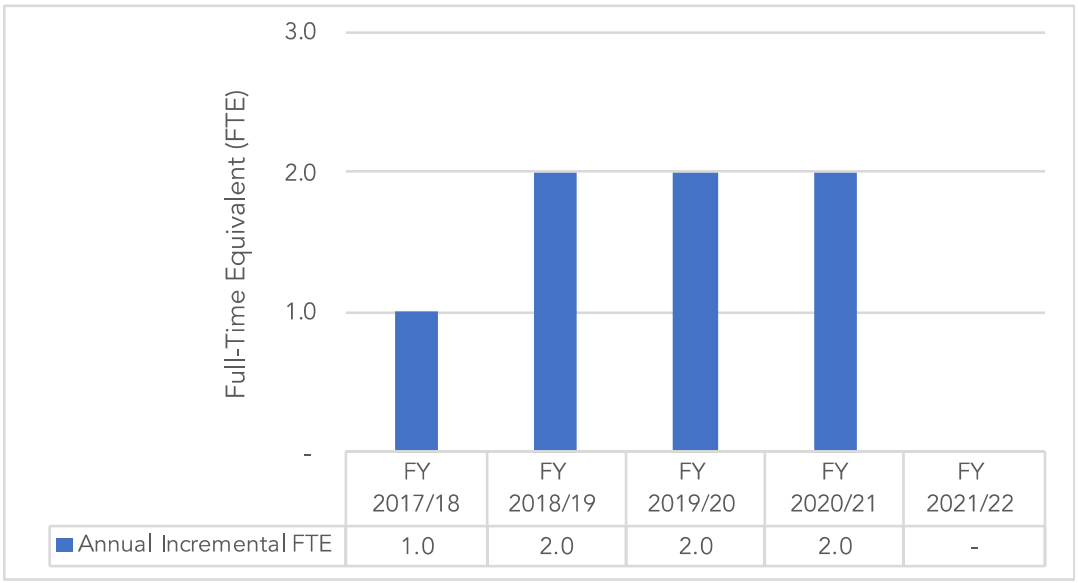


Figure 13 presents the annual incremental positions needed. In this example, two additional positions would be needed each year between FY 2018/19 and FY 2020/21 to reach the needed levels presented in Figure 12. This represents the incremental staffing impact.

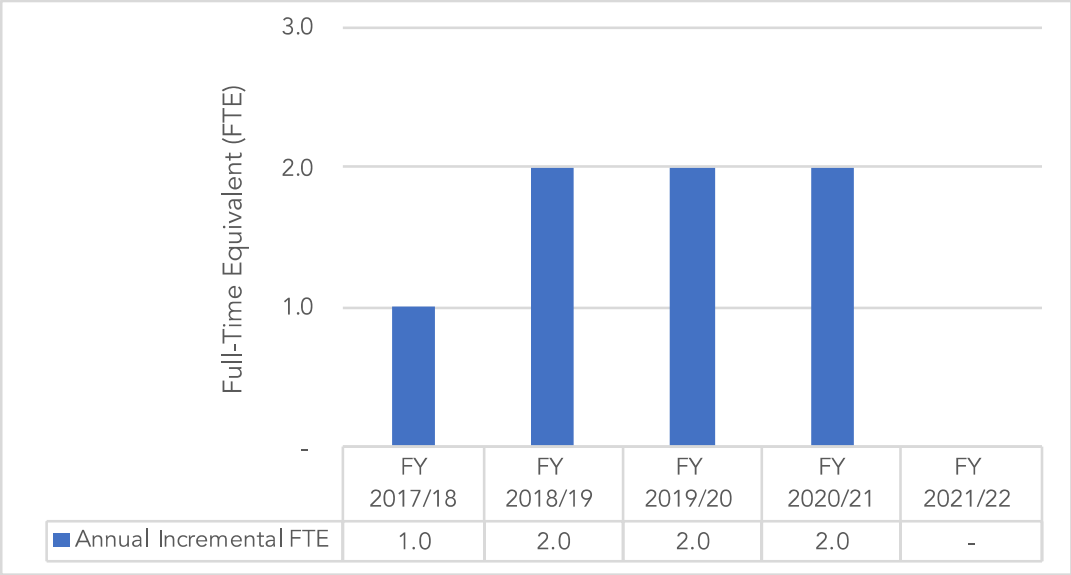


Figure 13. Annual New Incremental Staffing Impact

7 Limitations of CAP Implementation Cost Estimates

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 apply.

7.1 CAP Status

As described in Section 2.2, a CAP ICA can be done at different points in the climate action planning cycle. The status of the CAP, 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 activities 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 here 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 end year of the CAP. As a result, CAP ICA is a snapshot over a limited time horizon, 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 the 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, it is insufficient to determine the total cost, which would also have 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 focused only on total costs, it would not provide information on the incremental nature of those costs.

7.5 No Consideration of GHG Emissions

CAP ICAs do not consider the GHG emissions associated with CAP measures. It is common for 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 ($/MT CO_2e). This would be inappropriate in the case of an ICA because there is no way to correlate the amount of GHG reductions that would occur due to the specific expenditures estimated for a given time frame (e.g., five years). For example, it would not be accurate to divide costs for the first five years by the total GHG reductions that are expected by 2030, because there will be additional local jurisdiction costs associated with achieving those reductions in later years. GHG reductions are incorporated into a CAP benefit-cost analysis, which also includes data and results from an ICA, to determine CAP measure cost-effectiveness ($/MT CO_2e; see Technical Appendix 3 – 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 3: 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 Regional Framework for Climate Action Planning only and may be updated to include new data collection and calculation methods in the future.