



THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

# Committee Item INFORMATION

## ***Finance and Asset Management Committee***

4/9/2024 Committee Meeting

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6a

### **Subject**

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Climate Adaptation Master Plan for Water: Draft Year One Report

### **Executive Summary**

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In February 2023, the Board directed staff to integrate water resources, climate, and financial planning into a Climate Adaptation Master Plan for Water (CAMP4W or Master Plan). Specifically, the Master Plan will include: (1) Climate and Growth Scenarios; (2) Time-Bound Targets; (3) A Framework for Climate Decision-Making and Reporting; (4) Policies, Initiatives, and Partnerships; and (5) Business Models and Funding Strategies. CAMP4W will increase Metropolitan's understanding of the climate risks to water supplies, infrastructure, operations, workforce, and financial sustainability. CAMP4W will also develop decision-making tools and long-term planning guidance for adapting to climate change to strengthen Metropolitan's ability to fulfill its mission.

This committee item presents the first installment of the Draft Climate Adaptation Master Plan for Water Year One Progress Report (Draft Report). The Draft Report documents progress since February 2023 and sets up next steps for 2024, including discussion of Metropolitan's business model and funding strategies, proposed Go Projects, policy recommendations, partnership opportunities, and an adaptive management framework. Progress to date includes work to establish the values and priorities of the Board and Member Agencies, components of a Climate Decision-Making Framework, Time-Bound Targets, and the process for identifying projects and programs for evaluation. The attached Draft Report includes the Table of Contents, Executive Summary, and sections on Background and Need and the Climate Decision-Making Framework. The additional chapters will be presented in draft form ahead of the April CAMP4W Task Force Meeting.

This item is in preparation for an Action Item at the May Finance and Asset Management Committee requesting the Board's concurrence with the Draft Report's use for planning purposes and as an accurate representation of discussions and input on the CAMP4W planning process to date acknowledging that this is an iterative process that will continue to evolve throughout 2024.

### **Fiscal Impact**

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Not applicable

### **Applicable Policy**

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By Minute Item 52776, dated April 12, 2022, the Board adopted the 2020 Integrated Water Resources Plan Needs Assessment.

By Minute Item 52946, dated August 15, 2022, the Board adopted a resolution affirming Metropolitan's call to action and commitment to regional reliability for all member agencies.

By Minute Item 53381, dated September 12, 2023, the Board approved the use of Representative Concentration Pathway (RCP) 8.5 for planning purposes in the Climate Adaptation Master Plan for Water.

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**Related Board Action(s)/Future Action(s)**

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Future presentation of different components of the Master Plan to committees and full Board concurrence at meetings and dates set forth in chart and text below.

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**Details and Background**

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**Background****Draft CAMP4W Year One Progress Report**

The Draft CAMP4W Year One Progress Report (Draft Report) documents Metropolitan's progress to date and provides next steps for finalizing a Draft Master Plan in December 2024. Since February 2023, the Board and Member Agencies have regularly and substantially engaged with Metropolitan staff to understand and assess climate risks, set priorities and goals for climate adaptation, and develop a Climate Decision-Making Framework to inform the Board's investment decisions. Working Memos #1-6, Board and Member Agency discussions and comment letters, public input, technical modeling, and analysis are compiled in the Draft Report. Additional input will be incorporated based on Task Force discussions and comment letters before requesting Board concurrence with a Final Year One Progress Report at the Finance and Asset Management Committee Meeting in May 2024.

At the May Finance and Asset Management Committee Meeting, staff will request Board concurrence with the Draft Report for planning purposes. Similar to the Long-Range Finance Plan Needs Assessment, the Draft Report is an important tool in the CAMP4W process. It documents input from the Board and Member Agencies to date, creates a foundation in climate adaptation needs and planning, and provides a framework for climate-based decision making. With concurrence, as opposed to an approval, the Board will reiterate the importance of CAMP4W being an iterative process that will continue to evolve over the coming months to develop a Draft Master Plan by December 2024, and over the coming years as Metropolitan continues to make climate-informed investments and decisions.

Attached is the first installment of the Draft Report, which includes the Table of Contents, Executive Summary and the Background and Climate Decision-Making Framework sections. This committee item discussion will focus on those drafted sections as well as the "Development of Adaptation Strategies" section. The additional sections will be presented in draft form ahead of the April CAMP4W Task Force Meeting. The Year One Progress Report includes two focus areas: (1) Progress to Date; and (2) Next Steps for 2024 (see below).

Included below are updates to components of the Climate Decision-Making Framework based on recent discussions and input.

## Outline of CAMP4W Year One Progress Report

<ul style="list-style-type: none"> <li>0. EXECUTIVE SUMMARY</li> <li>1. CAMP4W PURPOSE, NEED AND OUTCOME <ul style="list-style-type: none"> <li>a. Summary of Metropolitan’s System, Assets and Member Agencies</li> <li>b. Purpose and Need of Climate Adaptation Planning</li> <li>c. Summary of Planning Efforts to Date</li> <li>d. CAMP4W Process Overview</li> </ul> </li> <li>2. CLIMATE DECISION-MAKING FRAMEWORK <ul style="list-style-type: none"> <li>a. Overall Climate Decision-Making Framework Process</li> <li>b. Adaptive Management <ul style="list-style-type: none"> <li>i. Evaluative Criteria</li> <li>ii. Time-Bound Targets</li> </ul> </li> </ul> </li> <li>3. DEVELOPMENT OF ADAPTATION STRATEGIES <ul style="list-style-type: none"> <li>a. CAMP4W Projects and Programs</li> <li>b. Sources for Project Identification <ul style="list-style-type: none"> <li>i. Vulnerability and Risk Assessments</li> <li>ii. Drought Mitigation Action Plan</li> <li>iii. System Capacity Planning</li> <li>iv. Resource Studies / Program Development</li> <li>v. Flexibility and Supply Planning</li> </ul> </li> <li>c. Project and Program Evaluation Process <ul style="list-style-type: none"> <li>i. Evaluative Criteria Scoring</li> <li>ii. Providing a Portfolio-View</li> <li>iii. Long-Range Financial Considerations</li> </ul> </li> </ul> </li> </ul>	<p style="text-align: center; font-size: 2em;">Progress to Date</p>
<ul style="list-style-type: none"> <li>4. BUSINESS MODEL AND AFFORDABILITY <ul style="list-style-type: none"> <li>a. Role of Long-Range Finance Plan</li> <li>b. Business Model Options</li> <li>c. Addressing Affordability</li> </ul> </li> <li>5. POLICIES, INITIATIVES AND PARTNERSHIPS <ul style="list-style-type: none"> <li>a. Initial Policy Recommendations</li> <li>b. Partnership Opportunities</li> <li>c. Programs and Initiatives to Pursue</li> <li>d. Community Engagement</li> </ul> </li> <li>6. ADAPTIVE MANAGEMENT <ul style="list-style-type: none"> <li>a. Adaptive Management Framework</li> <li>b. Identification of Go Projects and Programs</li> <li>c. Signposts and Monitoring</li> <li>d. CAMP4W Reporting and Updates</li> </ul> </li> </ul>	<p style="text-align: center; font-size: 2em;">Next Steps for 2024</p>

**CAMP4W Task Force and Committee Meeting Schedule and Discussion Topics Through May 2024**

April 9	Finance and Asset Management Committee	Draft Year One Progress Report (Info Item)
April 23	Equity, Inclusion and Affordability Committee	Report on Water Affordability Panels and Recommended Actions
April 24, 9:30 am - 12:30 pm	<b>CAMP4W Task Force</b> (LTRPPBM Subcommittee)	Draft Year One Progress Report (Business Model and Funding Strategies, Policies, Partnerships, Adaptive Management)
May 14	Finance and Asset Management Committee and Board	Draft Year One Progress Report (Action Item)

CAMP4W Task Force Meetings (LTRPPBM Subcommittee) are currently scheduled for the fourth Wednesday, 9:30 am - 12:30 pm throughout 2024.

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*Elizabeth Crosson* *Date*  
*Chief Sustainability, Resilience, and*  
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*Adel Hagekhalil* *Date*  
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**Attachment 1 – Draft CAMP4W Year One Progress Report (TOC, Executive Summary, Sections 1-2) (rev. 4/3/24)**

Ref# sri12694545



DRAFT



**CAMP4W**

**Climate Adaptation  
Master Plan for Water**

# Year One Progress Report



Metropolitan Water  
District of Southern  
California

APRIL 2024





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**Adapting to Extreme Conditions brought on by  
a Changing Climate.**

Flood  
 Fire  
 El Niño  
 Atmospheric River  
 Earthquake  
 Drought  
 La Niña  
 Salinity  
 Sea-Level Rise  
 Wind  
 Heat

# Acknowledgements

This progress report for the Climate Adaptation Master Plan for Water would not be possible except for the dedication of Task Force Members, Metropolitan's Staff, and consultants.

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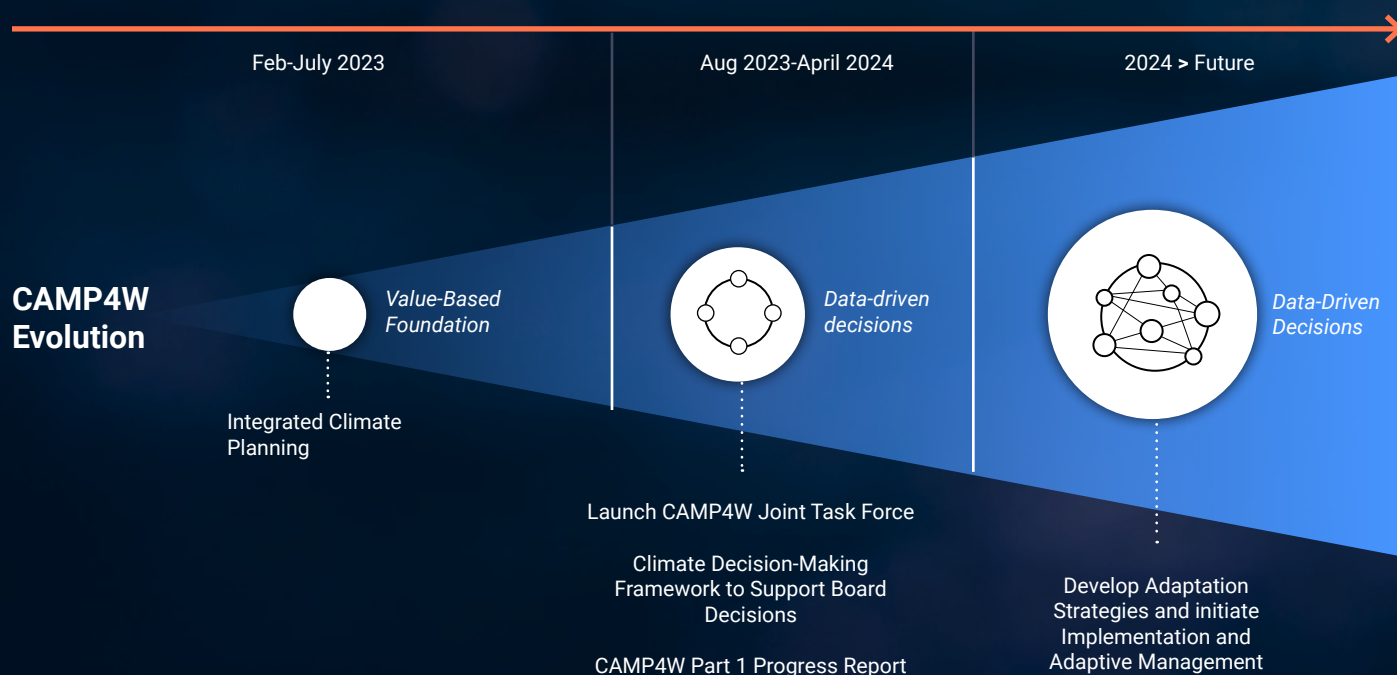
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# Executive Summary

## CAMP4W Problem Statement

Extreme weather conditions in recent years have presented Southern Californians with an unsettling preview of the challenges ahead – weather whiplash is abruptly swinging the state from periods of severe and extended drought to record-setting wet seasons. There is no question that climate change is here and putting mounting pressure on the year-to-year management of all our available water resources. To ensure the continued reliability of water supplies for the communities we serve, Metropolitan is developing a Climate Adaptation Master Plan for Water (CAMP4W), that will increase Metropolitan’s understanding of the climate risks to water supplies, infrastructure, operations, workforce, and financial sustainability. It will provide a roadmap that will guide our future capital investments and business model as we confront our new climate reality in the years and decades ahead.

This CAMP4W Year One Progress Report presents an overview of the work Metropolitan has done to date and maps out the work to be done through the remainder of 2024 and beyond.





## CAMP4W Joint Task Force Charter

On November 21, 2024, Metropolitan's Board of Directors chartered a Joint Task Force of Board Members and Member Agency Managers to oversee the development of the CAMP4W process and Master Plan. CAMP4W was designed to include the following components:

- **Climate and Growth Scenarios:** Utilize climate scenarios—based on RCP 8.5 as set by the board and regularly updated to reflect real-world conditions and climate risks—to assess and set ranges of variability of water supplies from the State Water Project, the Colorado River, and regional hydrology as well as regional growth scenarios that indicate demands of different Member Agencies.
- **Time-Bound Targets:** Set targets to achieve by 2026, 2032, and 2045 for efficiency, conservation (including GPCD across the entire service area), system interconnection, water supply, equity and affordability, and other targets as needed and identified.
- **Framework for Climate Decision-Making and Reporting:** Establish a Climate Decision-Making Framework for the Board of Directors to align Metropolitan's project-level investments with a set of Evaluative Criteria developed to match the values and priorities of the Board while complementing Member Agencies' individual plans and investments. The framework is part of an adaptive management approach and provides a platform for regular reporting—at least annually—on progress toward the targets and other indicators established by the master plan.
- **Policies, Initiatives, and Partnerships:** Implement policies, initiatives, and regional partnerships that will achieve the resource-based and policy-based targets in order to address the range of potential regional supply gaps among Member Agencies.
- **Business Models and Funding Strategies:** Assess and recommend business model options and rate enhancements—as well as strategies to secure funding at the State and Federal levels—that help achieve the targets while ensuring long term financial sustainability, equity, and affordability.





As Metropolitan embarks on preparing for the future through **planning under deep uncertainty**, it is as important as ever that we make informed, educated, and intentional decisions on where and how we invest. We must balance the need to be prepared for the future, with the need to balance costs and not over build or create stranded assets. As an agency responsible for supplying water to our 26 Member Agencies, who serve the 19-million person service area across 5,200 square miles, the impacts of our decisions are far reaching.

## PLANNING UNDER DEEP UNCERTAINTY

Worldwide, agencies are grappling with the impacts of climate change on our planet, resources, infrastructure, and workforce. In the past, analyses heavily relied on historical data to anticipate what might come in the future. With climate change, looking at the past to predict the future is less reliable. We must plan differently and be prepared for a level of volatility that we did not face in the past. It is as important as ever to be nimble in our planning, decision-making, and implementation process. For this, Metropolitan is employing an Adaptive Management Approach.



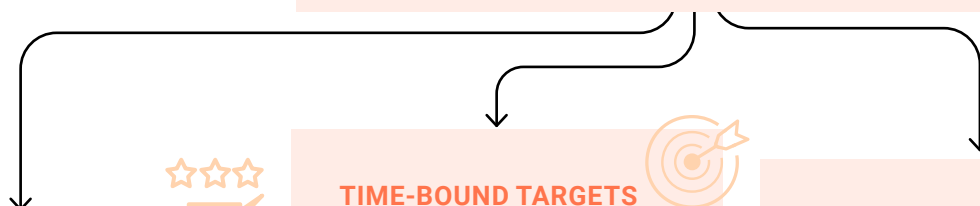
## ADAPTIVE MANAGEMENT

Metropolitan recognizes that planning under deep uncertainty requires flexibility and adaptability and acknowledges that future projections represent a range of possible outcomes with varying levels of resource development needs. Adaptive management allows Metropolitan to make investment decisions incrementally and refining decisions over time, based on evolving information and real-world conditions following the Climate Decision-Making Framework.



## THE CLIMATE DECISION-MAKING FRAMEWORK

The Climate Decision-Making Framework provides a process for evaluating projects to inform the Board's decision-making about investments. Key metrics used in the process include **Evaluative Criteria** that projects and programs are evaluated under, while striving to achieve established **Time-Bound Targets**. We regularly must track real-world **Signposts** to identify if the conditions under which the Time-Bound Targets were developed remain relevant or need to be adjusted.



## EVALUATIVE CRITERIA

A defined set of criteria used to establish a score for projects and programs which support the board's decision-making process. Evaluative Criteria are used in collaboration with the Time-Bound Targets and Signposts to support investment decisions.

## TIME-BOUND TARGETS

A series of resource development targets and policy-based targets that establish goals to be achieved in the near-, mid-, and long-term. Time-Bound Targets are set based on current planning targets (current real-world conditions) and are updated based on Signposts.

## SIGNPOSTS

Real-world metrics that allow Metropolitan to monitor how projections align with the real world. Signposts will guide the revision of Time-Bound Targets over time, shaping project and program development and helping inform the Board's investment decisions at different project stages.



# Climate Decision-Making Framework Overview

The Climate Decision-Making Framework is intended to define a consistent, stepwise process of making project and program investment decisions. It is based on Metropolitan priorities and the need to remain reliable and resilient into the future, while considering financial sustainability, affordability, and equity. Figure 1 illustrates the Climate Decision-Making

Framework, which will continue to be refined and tested over the remainder of 2024 as the comprehensive CAMP4W is completed. Over time, Metropolitan will also have the opportunity to refine the framework in the future through the Adaptive Management process as conditions change and the region adapts.

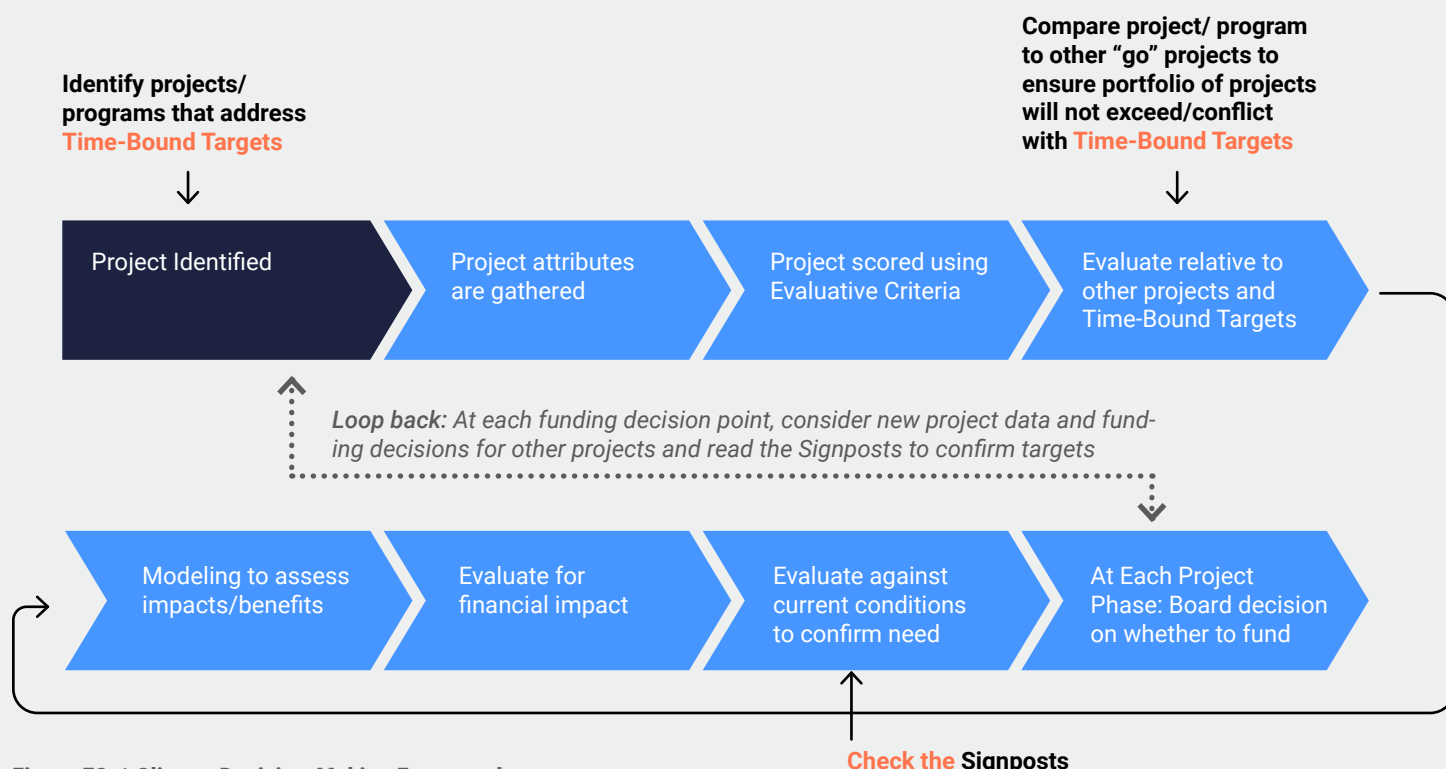


Figure ES-1 Climate Decision-Making Framework

## Summary of Key Metrics in the Climate Decision-Making Process


The Climate Decision-Making Framework utilizes three key elements including Evaluative Criteria, Time-Bound Targets, and Signposts to support the decision process and allow Metropolitan to refine decisions over time through an adaptive management approach. Each of these three elements were developed to represent actionable metrics that support the Board as expressed in the CAMP4W Themes. The following pages summarize the Evaluative Criteria, Time-Bound Targets, and Signposts under each Theme. Section 2 provides additional discussion on each of the three elements.



Five CAMP4W Themes include **reliability, resilience, financial sustainability, affordability, and equity** and reflect the Board values. They serve as overarching guiding principles for the CAMP4W process and are reflected in the Evaluative Criteria, Time-Bound Targets, and Signposts.



# Evaluative Criteria

A defined set of criteria used to establish a score for projects and programs which support the board's decision-making process. Evaluative Criteria are used in collaboration with the Time-Bound Targets and Signposts to support investment decisions.

 <b>RELIABILITY</b> 25 POINTS	 <b>RESILIENCE</b> 25 POINTS	 <b>FINANCIAL SUSTAINABILITY &amp; AFFORDABILITY</b> 20 POINTS
Supply Performance Equitable Reliability	Addresses known vulnerabilities Project's ability to perform under climate impacts	Bond capacity Unit cost
Assess how a project or program performs under various hydrologic conditions, the extent to which it helps close gaps identified in the IRP Needs Assessment, and how it can address an inequity in supply reliability.	Evaluates how the project or program addresses known vulnerabilities and how it performs under climate impacts.	Considers the ability of a program to be funded through bonds and the overall cost of the program.
 <b>ADAPTABILITY &amp; FLEXIBILITY</b> 10 POINTS	 <b>EQUITY</b> 10 POINTS	 <b>ENVIRONMENTAL CO-BENEFITS</b> 10 POINTS
Flexibility of existing assets Ease / Complexity Scalability	Programs for underserved communities Scale of community engagement Public health benefits Workforce development	Greenhouse gas emissions Benefits Ecosystem services Habitat/wildlife benefits
Considers how a project or program improves operational flexibility, the difficulty of implementation, and if a program is able to be phased. Flexibility addresses the capability of Metropolitan's system to respond to changes in water supply, water quality, treatment requirements, or demands during planned and unplanned facility outages.	Consideration of underserved communities, scale of community engagement, public health, and workforce development.	Measures greenhouse gas emissions, ecosystem services, and benefits to habitat and wildlife.

# Time-Bound Targets

Below is a summary of the initial resource development targets and policy-based targets that will be expanded upon over the coming year. Section 2 presents additional categories of Time-Bound Targets that will also be explored.

 <b>Resource-Based Targets</b> Numbers reflect additional supplies unless indicated otherwise	CATEGORY	NEAR TERM	MID TERM	LONG TERM
	Core Supply <sup>1</sup>	N/A	Identify 300 TAF for potential implementation by 2035.  Alternatively, 250 TAF of new storage will reduce core supply need to 200 TAF	Identify 650 TAF for potential implementation by 2045. Alternatively, 250 TAF of new storage will reduce core supply need to 550 TAF or, 500 TAF of new storage will reduce core supply need to 500 TAF
	Storage	Identify up to 500 TAF for potential implementation by 2035		
	Flex Supply (Dry Year Equivalent)	Acquire capability for up to 100 TAFY		
 <b>Policy-Based Targets</b>	CATEGORY	NEAR TERM	MID TERM	LONG TERM
	Equitable Supply Reliability	Add 160 CFS capacity to the SWPDA by 2026	Implement additional 130 CFS capacity to SWPDA by 2032	Implement capacity, conveyance, supply, and programs for SWPDA by 2045
	Local Agency Supply <sup>2</sup>	Maintain 2.09 to 2.32 MAF (under average year conditions)	2.12 to 2.37 MAF (under average year conditions)	2.14 to 2.40 MAF (under average year conditions)
	Demand Management <sup>3</sup>	Implement structural conservation programs to achieve 300 TAF by 2045		
	Regional Water Use Efficiency	Assist Retail Agencies to achieve, or exceed, compliance with SWRCB Water Use Efficiency Standards <sup>4</sup>		
		GPCD target for 2030 <sup>5</sup>	GPCD target for 2035	GPCD target for 2045
	Greenhouse Gas Reduction	N/A	40% below 1990 emission levels by 2030	Carbon Neutral by 2045
	Surplus Water Management	Develop capability to manage up to 500 TAFY of additional wet year surplus above Metropolitan's Storage Portfolio and WSDM action		

## Notes

**1** Core Supply sub-targets will be considered later this year and may include targets for groundwater remediation and stormwater capture.

**2** This initial target includes existing (and under construction) local agency supplies and can be augmented later this year to include new local agency supply.

**3** Used to offset the need for additional core supply and using 2024 as a baseline.

**4** Each retail water supplier will report progress to the State Water Board annually through a Water Use Objective (WUO) equaling the sum of efficiency budgets for a subset of urban water uses: residential indoor water use, residential outdoor water use, real water loss and commercial, industrial and institutional landscapes with dedicated irrigation meters. Each efficiency budget is calculated using a statewide efficiency standard and local service area characteristics (population, climate, etc.).

**5** Specific GPCD Time-Bound Targets will be identified later this year based on final SWRCB standards as well as Metropolitan's overall demand management target. The target will be designed to track water use efficiency trends by sector over time and will take local conditions, including climate, into consideration.

# Signposts

A key part of the Adaptive Management process involves reading the Signposts to understand the real-world conditions and determine if the Time-Bound Targets need to be revised, which would in turn impact investments. The complete CAMP4W will include a comprehensive and detailed list of Signposts that Metropolitan will be tracking. Below is a summary of the initial categories, which will be expanded upon over the coming year.

**Proposed Signposts Metrics Examples**

*Signposts should be measurable, updatable, and readily available*

DEMAND	SUPPLY	INFRASTRUCTURE	FINANCIAL
Population	Climate Change Indicators	Unexpected shutdowns	O&M trends
Economy	Regulations	Infrastructure loss	Capital cost trends
Local Agency Supply	Storage	Emergency response	Emergency Response costs
Demand Management	Water Quality	Power interruptions	
Regulations			



Annually, Metropolitan will “Read the Signposts” to provide the Board a summary of the current status of each Signpost. It will include a brief assessment of any trends and what the findings may indicate. This will help the Board with making investment decisions, evaluating progress and identifying any adaptive management actions.



# CAMP4W Background, Need, and Outcome

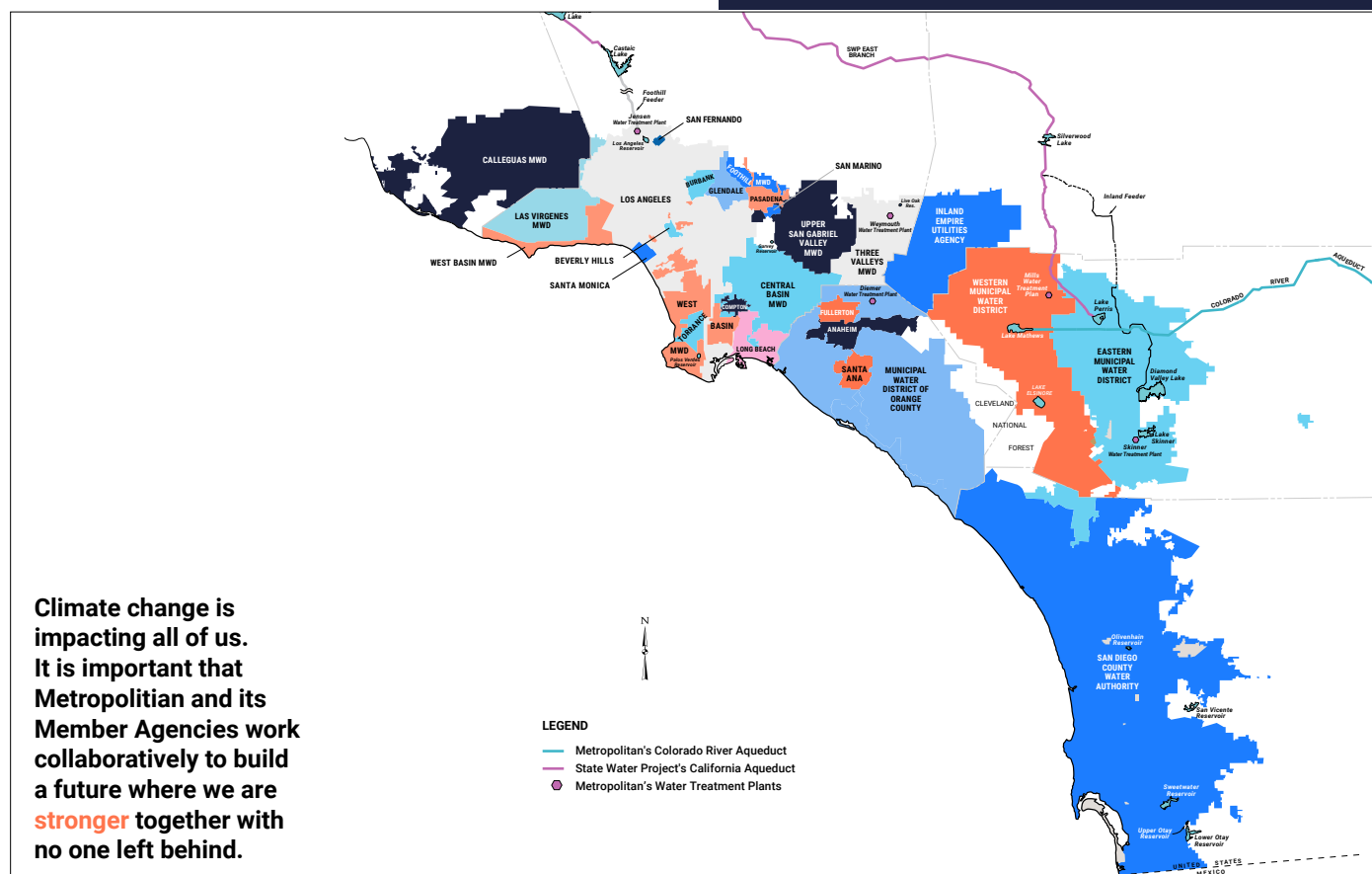
## 1.1 Summary of Metropolitan's System, Assets, and Member Agencies

Metropolitan's mission is to provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way. To do this, Metropolitan delivers approximately 1.5 billion gallons of water daily to its 26 Member Agencies, who serve the 19-million person service area across 5,200 square miles. Metropolitan operates and maintains an expansive range of reservoirs, five water treatment plants, hydroelectric facilities, 830 miles of pipelines including large-diameter pipelines and tunnels and about 400 service connections.

Metropolitan's 26 Member Agencies, presented on the map, vary widely in terms of their size, whether they are retailers or wholesalers, the climate they experience, and their percent dependence on Metropolitan.

Climate zones range from the cooler coastal areas to hotter inland regions, while land use ranges from densely urban areas to heavy industrial areas to open agricultural lands, where the volume and nature of water use varies significantly. Nearly one third of the region's population is classified as disadvantaged, indicating that affordability considerations will vary across the region (DWR DAC Mapping tool, <https://water.ca.gov/Work-With-Us/Grants-And-Loans/Mapping-Tools>).

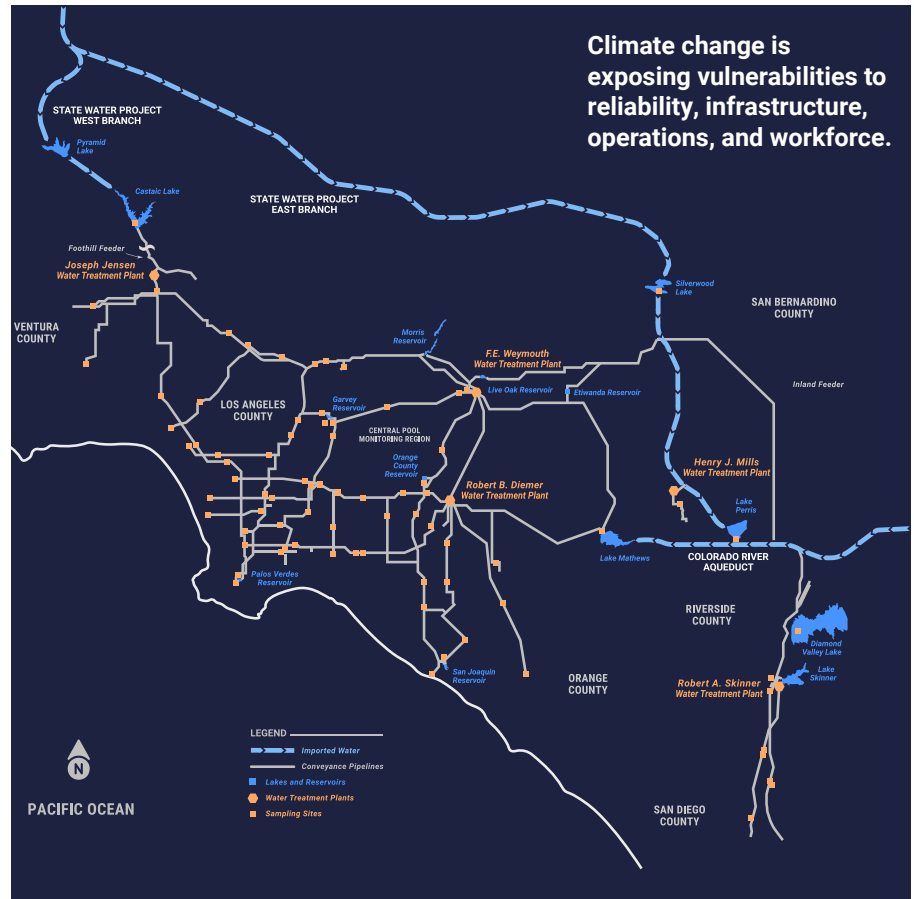
Southern California's water supplies are facing major long-term threats, brought on by climate change, emerging contaminants and evolving ecological needs. Three consecutive years of recent drought left State Water Project dependent areas with shortages, threatening the health and wellbeing of our residents. Metropolitan is committed to helping the region overcome these challenges with careful planning, vision and leadership to ensure our communities have the water they need for generations to come.



## 1.2 Purpose and Need for Climate Adaptation Planning

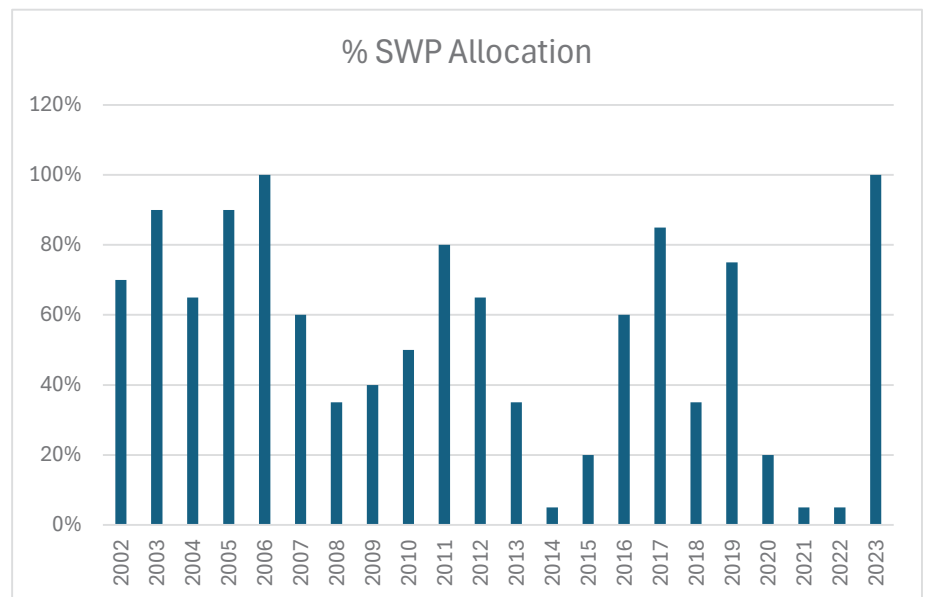
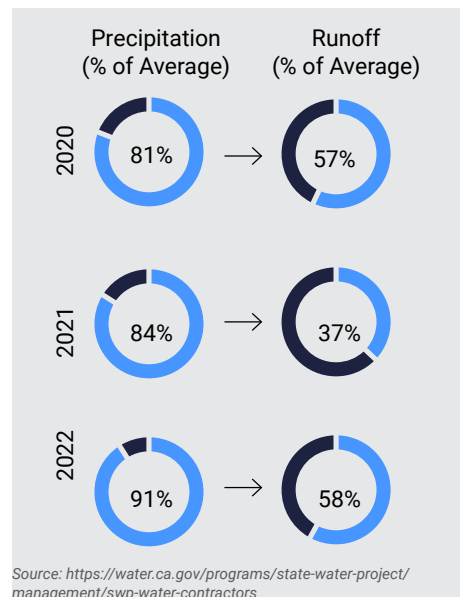
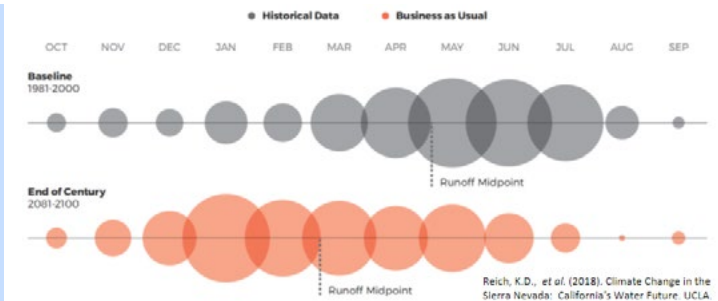
Worldwide, agencies are grappling with the reality that climate change is impacting our lives in a multitude of ways. Extreme weather events such as drought, flooding, wildfires, heat waves, and windstorms, as well as sea level rise and the compounded impacts of climate change on other hazards such as earthquakes, are driving decisions. Metropolitan faces these challenges and must prepare for the future.

Preparing for the future and providing a reliable supply of water to its Member Agencies is not new to Metropolitan. What the CAMP4W process addresses is the need to put climate change at the forefront, to intentionally look at all aspects of Metropolitan's system through that lens, and to recognize that hard decisions will need to be made and a transparent process will need to be in place.



### IMPACTS TO RUNOFF: CLIMATE CHANGE STRESSES THE WATERSHEDS FEEDING OUR STORAGE

- Less snow/more rain
- More frequent and hotter fires
- More frequent and severe flooding
- Longer and drier dry periods



Reliability of runoff efficiency and supplies are decreasing

# Impacts Beyond Drought

Metropolitan faces many challenges operating in a changed climate.

## Heat and Extreme Drought



Extreme heat and drought in Lake Mead  
(photo credit: United States Bureau of Reclamation)

## Climate Risks to Southern California's Water Resources



## Sea Level Rise



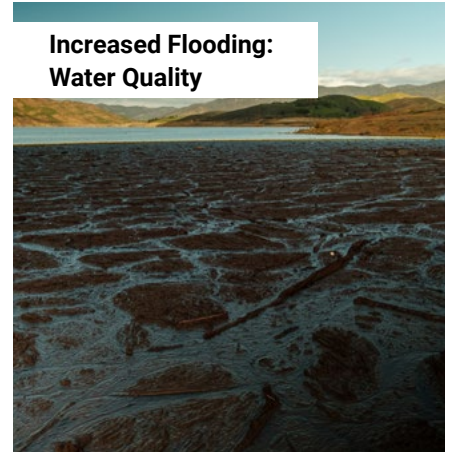
Roaring River levees overtop at Grizzly Island in Solano County located in the Sacramento-San Joaquin River Delta  
(Photo: Department of Water Resources)

## Increased Flooding: Damages



Flood damages at the Whitewater River near the Colorado River Aqueduct.

## Increased Flooding: Water Quality



Mud and dirt washed into Castic Lake due to heavy rains.

## Wildfires



Wildfires near Diemer Water Treatment Plant, Yorba Linda, CA

## Reduced Snowpack



Department of Water Resources Snow Survey 2024.

## Workforce Impacts



Extreme heat and other risks impact Metropolitan's workforce.



## 1.3 Summary of Planning Efforts to Date

### IRP Needs Assessment

Metropolitan's robust integrated planning process and evaluation of projected future conditions has guided Metropolitan for decades, starting with the 1996 Integrated Water Resources Plan (IRP). Member Agency data has been an integral part of the process, facilitated by Metropolitan's annual outreach to each Member Agency. While Metropolitan has consistently evaluated future uncertainty, the 2020 IRP Needs Assessment saw Metropolitan take its future planning processes into an expanded direction with the inclusion of **scenario planning**.

Metropolitan developed four scenarios (A, B, C and D, see Figure 1-2), which serve to represent the range of potential drivers that impact the region's supply and demand including economic conditions, population growth, regulatory requirements, and climate impacts to name a few. Based on the modeling done during the IRP Needs Assessment (Figure 1-2), the range in the water supply gap was determined, as shown in Table 1. This analysis forms the basis for the Adaptive Management metrics discussed in Section 2.2.

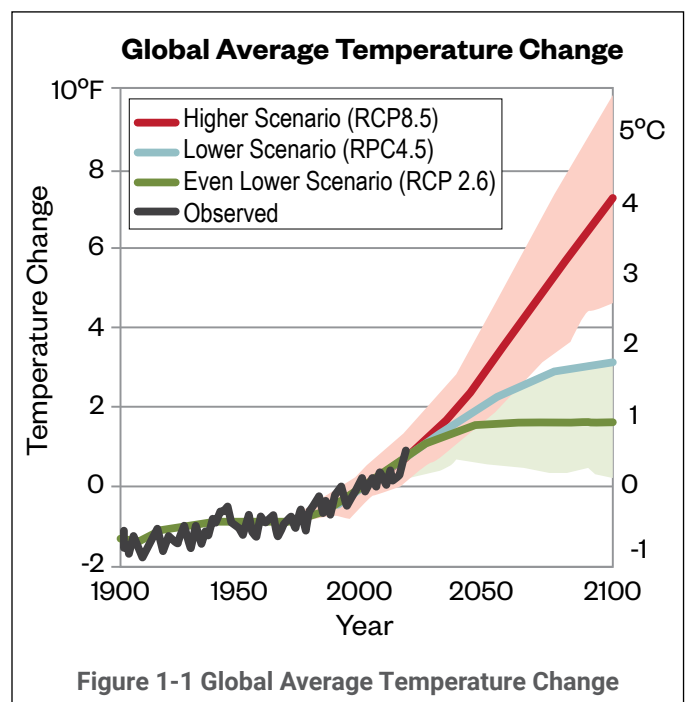


### SCENARIO PLANNING

Recognizing that a multitude of factors contribute to the demands on Metropolitan and the availability of its supplies, Scenario Planning allows us to examine the boundaries of what is reasonably likely to occur in the future since scenario planning “bookends” the range of possible future needs. By understanding what the supply gap could be under a variety of conditions, Metropolitan is able to decide what direction to plan towards. Next, using the Adaptive Management Approach, Metropolitan will be able to adjust planning targets as real-world conditions reveal where along the spectrum our needs are trending, which will inform incremental investment decisions.



In 2024, Metropolitan's Board voted to plan toward Representative Concentration Pathway (RCP) 8.5, which acknowledges a need to prepare for a more extreme climate impacted future. RCP 8.5 is expressed in Scenarios C and D. By planning toward Scenario D and implementing based on real-world conditions Metropolitan will balance the need to be prepared while limiting the risk of stranded assets if conditions change.





## IRP NEEDS ASSESSMENT IDENTIFIED THREE CATEGORIES OF SUPPLY

**Core Supply:** A supply that is generally available and used every year to meet demands under normal conditions and may include savings from efficiency gains through structural conservation.

**Flexible Supply:** A supply that is implemented on an as-needed basis and may or may not be available for use each year and may include savings from focused, deliberate efforts to change water use behavior.

**Storage:** The capability to save water supply to meet demands at a later time. Converts core supply into flexible supply and evens out variability in supply and demand.

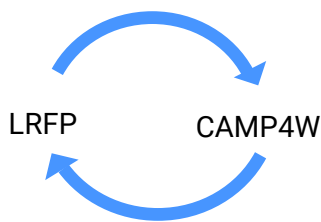
**Table 1: How Much Core Supply Do We Need Based on How Much Storage We Develop?**

If we build this much storage...	We will need this much additional core supply... (conservation reduces demands and "counts" toward core supply needs)			
	IRP Scenario A	IRP Scenario B	IRP Scenario C	IRP Scenario D
0 TAF	No supply or storage requirements	100 TAF	50 TAF	650 TAF
100 TAF		70 TAF	15 TAF	600 TAF
250 TAF		30 TAF	15 TAF	550 TAF
500 TAF		30 TAF	15 TAF	500 TAF

\* TAF=thousand acre-feet; 1 acre-foot is the amount of water that would cover an acre of land at 1-foot depth

## Long-Range Finance Plan

To address the reliability gaps identified in the IRP Needs Assessment, Metropolitan has begun the multi-phased, multi-year Long-Range Financial Plan (LRFP) development process. The initial LRFP Needs Assessment (LRFP-NA) (Phase 1) currently underway builds upon the IRP Needs Assessment and is consistent with the goals and objectives of the CAMP4W process pertaining to resiliency, reliability, financial sustainability, affordability, and equity.



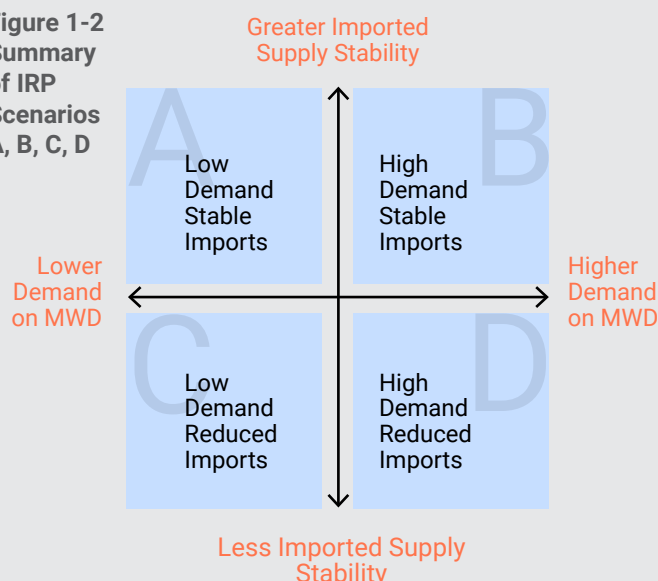
**Iterative process:** the LRFP will be revised based on the CAMP4W outcomes, and the LRFP assessment will inform the outcomes of CAMP4W.

## UNCERTAINTY AND THE ESTABLISHMENT OF ASSUMPTIONS

There is **inherent uncertainty** whenever an assumption is made, and in the IRP Needs Assessment, each scenario is defined by numerous assumptions. **Scenario planning and adaptive management capture that uncertainty** in the space between each scenario – the spectrum along which real-world conditions are likely to unfold. Each scenario presents a data point along that spectrum, where any number of variables could shift the outcome in one direction or another.

By adapting and modifying investment decisions over time, **Metropolitan will align implementation with real-world conditions** to reduce the risk of over or under developing resources.

**Figure 1-2**  
Summary of IRP Scenarios A, B, C, D



## THE LONG-RANGE FINANCIAL PLAN – NEEDS ASSESSMENT

The LRFP-NA is Phase 1 of the LRFP that provides high-level guidance on the rate impacts and funding opportunities. The LRFP-NA is designed to:

- Provide high-level financial analysis of rate and tax impacts under the IRP scenarios.
- Discuss the primary capital financing and funding methods Metropolitan has at its disposal.
- Introduce potential financial tools that could become components of a tailored financial strategy.
- Catalogue Metropolitan's key policies related to the capital markets.

The next phase of the LRFP will consider additional capital needs to address other vulnerabilities in addition to drought and assess the impacts of specific projects.

## Vulnerability Assessments, Hazard Mitigation, and Emergency Response

**Climate Vulnerability and Risk Assessment:** In conjunction with this process, Metropolitan has prepared a Climate Vulnerability and Risk Assessment (CVRA) to investigate how it is currently incorporating climate change risk into its planning and operational activities. The CVRA will inform the CAMP4W process by identifying how Metropolitan is currently managing risk associated with climate change and provide structural recommendations that will enable it to better adapt.

**Strategic Infrastructure Resilience Planning:** The SIRP is a multi-hazard and multidisciplinary plan that will address Metropolitan's ability to manage an event or risk as it unfolds, covering the water and electric power systems owned and operated by Metropolitan. Focus will be on restoring any lost or reduced services to member agencies in a timely manner following an event. The timeliness of service restoration will focus on the member agency's public health and safety needs and the regional socio-economics as related to water use.

**Local Hazard Mitigation Planning:** Metropolitan is developing a Local Hazard Mitigation Plan (LHMP) as part of its ongoing reliability efforts. The LHMP will document the risks from natural hazards such as earthquakes, drought,

and wildfires and identify goals and strategies for mitigating those risks. The LHMP is vital to help maintain Metropolitan's mission to provide its service area with reliable supplies even in emergencies caused by unplanned natural events.

**Facility Reliability Assessments and Emergency Response Planning:** Metropolitan invests in maintaining a reliable system and in its capability to respond to emergencies and restore service. MWD has formal emergency response plans that include staff, materials, and facilities needed to repair systems and restore service. The exercising and assessment of these plans identify projects that increase the resilience and sustainability of Metropolitan's infrastructure. These plans are regularly exercised and periodically assessed.

Additionally, Metropolitan conducts regular system reliability assessments to identify vulnerabilities that can lead to unplanned outages and proposes options to reduce these vulnerabilities.

Projects that are identified in this process that are not R&R projects will be evaluated in the CAMP4W process.



# 1.4 CAMP4W PROCESS OVERVIEW

In February 2023, the Board directed staff to integrate its water resources, climate, and financial planning into a Climate Adaptation Master Plan for Water (CAMP4W). Metropolitan conducted a series of workshops with the Board and held regular meetings with Member Agency Managers throughout 2023. To further facilitate the development of the CAMP4W in a timely and transparent manner, a Joint Task Force was chartered by the Board in October 2023. The Task Force is made up of Board members and Member Agency Managers, and is supported by Metropolitan staff. Staff have been developing the CAMP4W through iterative steps to allow for Board and Member Agency input at each step. The process involved outreach and engagement efforts, to encourage public input.

CAMP4W involves a multi-year iterative process in which various aspects of the process build upon one another (Figure 1-3). The initial development tasks outlined for the Task Force includes the development of this report through April 2024. The development of the remaining CAMP4W components will continue throughout the remainder of 2024.

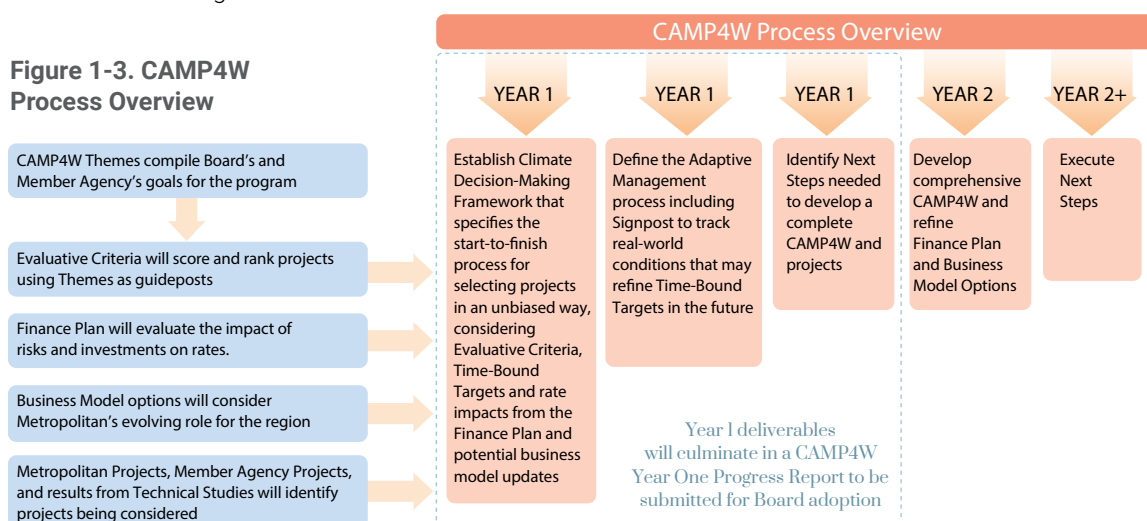
Preliminary objectives (that will be refined through the process) include:

- Increase the resiliency and reliability of Southern California's water supplies
- Build greater equity into our regional water storage and delivery systems, so that all our 26 Member Agencies have access to reliable water supplies, even in severe drought periods
- Pursue collaborative cost-sharing partnerships and promote affordability initiatives as we make the necessary investments to adapt Southern California's water infrastructure to the demands of the 21st century
- Clearly understand the Member Agency network of water resource supplies and infrastructure to determine opportunities to provide additional connectivity
- Understand the climate risks and vulnerabilities the network is facing
- Identify adaptation strategies that strengthen the network and reduce vulnerabilities
- Identify opportunities to expand water resources,
- Identify opportunities for strategic sharing of resources and infrastructure across Member Agencies to maximize all potential local supply options
- Develop a financial strategy to fund capital investments and equitably share both water supplies and costs among Member Agencies
- Develop a business model that supports Metropolitan's role into the future
- Explore partnerships with outside agencies and stakeholders to work towards our common goals.



CAMP4W will increase Metropolitan's understanding of the climate risks to **water supplies, infrastructure, operations, workforce, and financial sustainability**. CAMP4W will also develop decision-making tools and long-term planning guidance for adapting to climate change, to strengthen Metropolitan's ability to fulfill its mission.

**Figure 1-3. CAMP4W Process Overview**





# Climate Decision-Making Framework

## 2.1 Overall Climate Decision-Making Framework Process

The Climate Decision-Making Framework establishes the process by which projects and programs will be evaluated through CAMP4W to inform the Board's investment decisions. Figure 2-1 presents this process and identifies key considerations. To support the Adaptive Management process, which is at the cornerstone of CAMP4W, three key areas have been developed as part of the Year One effort. These include the Evaluative Criteria, Time-Bound Targets, and Signposts which are discussed in this section.

### Part of the Decision-Making Process

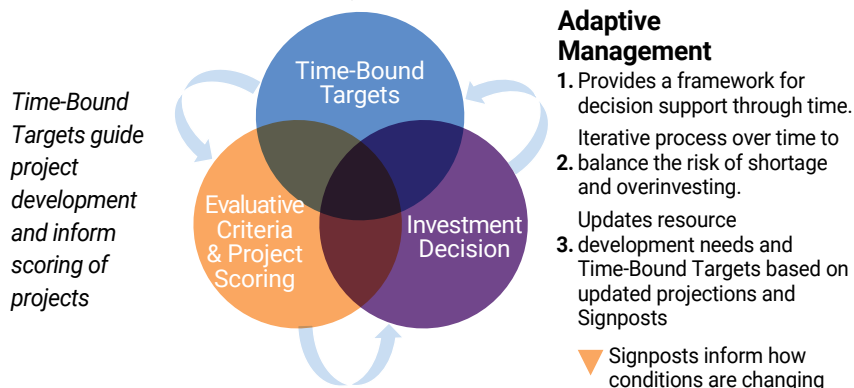
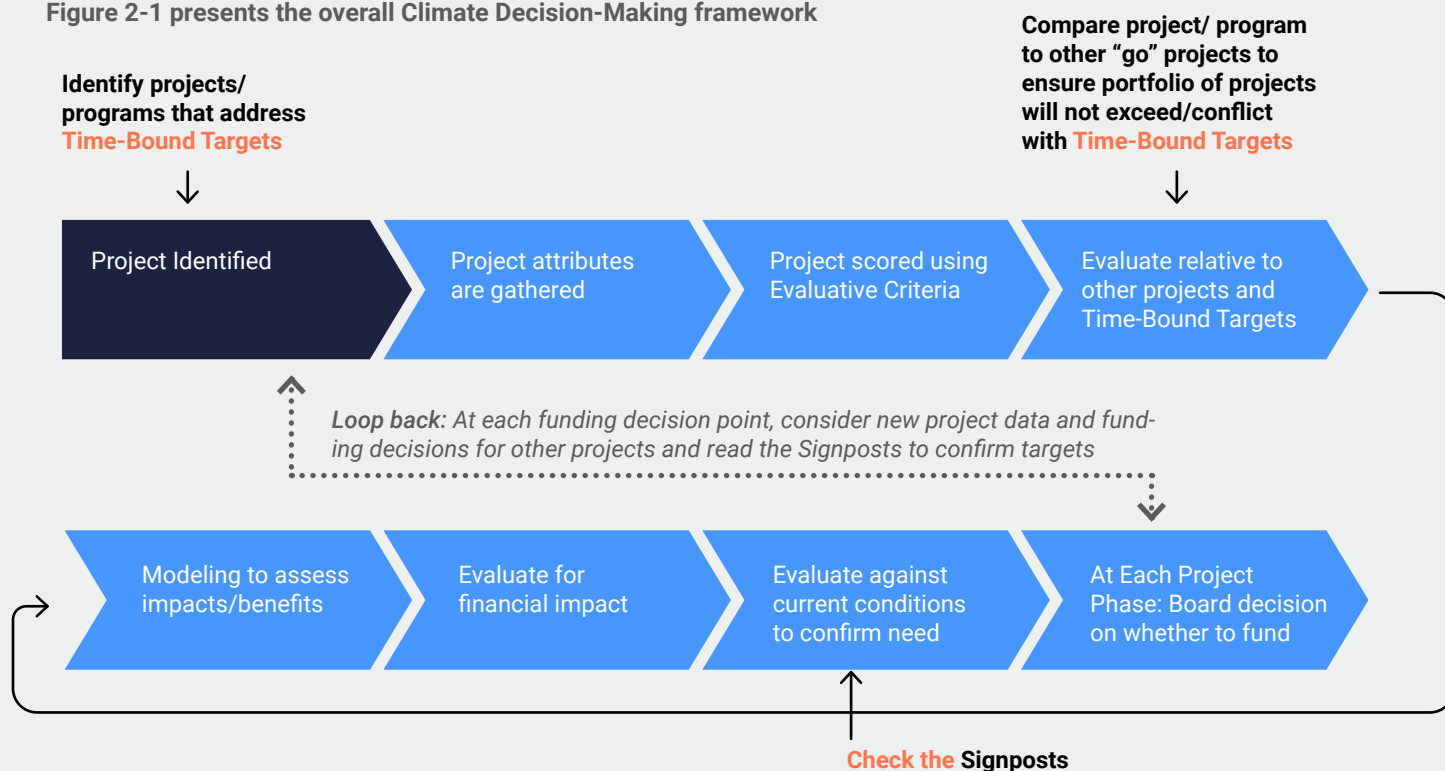


Figure 2-1 presents the overall Climate Decision-Making framework



## 2.2 Adaptive Management

As a living document, CAMP4W will be adjusted based on changing conditions to support Board decisions and provide the most up to date information available. More comprehensive updates will occur at intervals agreed upon by the Joint Task Force, potentially driven by the frequency of updates to the California Climate Change Assessment and/or the release of the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports, or other frequency similar to the historical IRP updates. Through this adaptive management process, the Board will have multiple points along each project's trajectory to make informed decisions on investments as projects move from one phase to the next (Figure 2.2)

### Adaptive Management Process

Planning for Rapid Change and Adjusting based on Real World Conditions

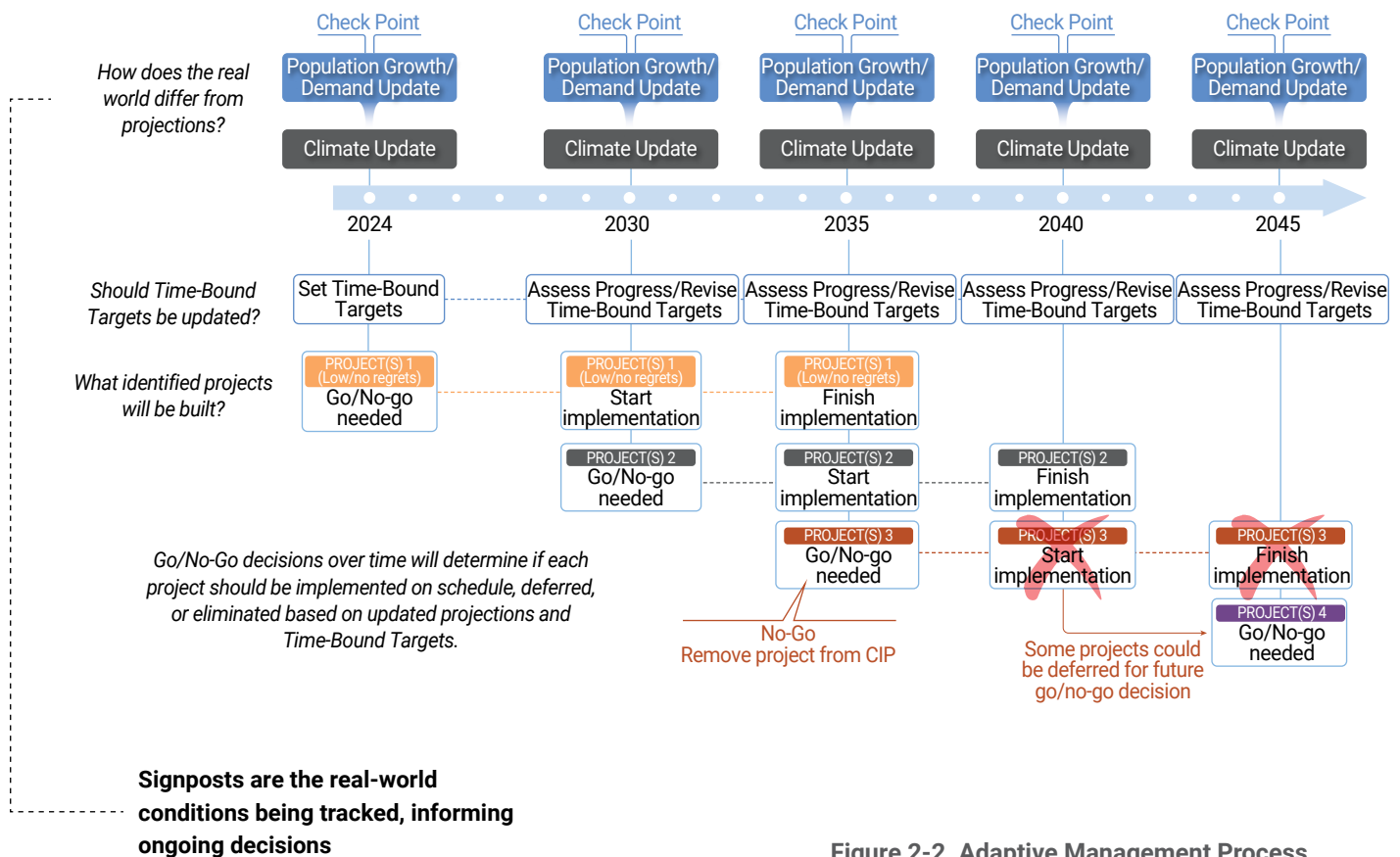


Figure 2-2. Adaptive Management Process

## 2.2.1 Evaluative Criteria

Evaluative Criteria are a key part of the Climate Decision-Making process. Figure 2-3 presents the proposed Evaluative Criteria that will be workshopped with the Board and Member Agencies through 2024.

### Evaluative Criteria



Evaluative Criteria are being developed based on the CAMP4W Themes of reliability, resilience, financial sustainability, affordability, and equity.



Figure 2-3. Evaluative Criteria

## 2.2.2 Time-Bound Targets

Figure 2-4 presents an initial set of Time-Bound Targets which will be refined over 2024 and may include additional categories

 <b>Resource-Based Targets</b> Numbers reflect additional supplies unless indicated otherwise	CATEGORY	NEAR TERM	MID TERM	LONG TERM
	Core Supply <sup>1</sup>	N/A	Identify 300 TAF for potential implementation by 2035.  Alternatively, 250 TAF of new storage will reduce core supply need to 200 TAF	Identify 650 TAF for potential implementation by 2045. Alternatively, 250 TAF of new storage will reduce core supply need to 550 TAF or, 500 TAF of new storage will reduce core supply need to 500 TAF
	Storage	Identify up to 500 TAF for potential implementation by 2035		
	Flex Supply (Dry Year Equivalent)	Acquire capability for up to 100 TAFY		
 <b>Policy-Based Targets</b>	CATEGORY	NEAR TERM	MID TERM	LONG TERM
	Equitable Supply Reliability	Add 160 CFS capacity to the SWPDA by 2026	Implement additional 130 CFS capacity to SWPDA by 2032	Implement capacity, conveyance, supply, and programs for SWPDA by 2045
	Local Agency Supply <sup>2</sup>	Maintain 2.09 to 2.32 MAF (under average year conditions)	2.12 to 2.37 MAF (under average year conditions)	2.14 to 2.40 MAF (under average year conditions)
	Demand Management <sup>3</sup>	Implement structural conservation programs to achieve 300 TAF by 2045		
	Regional Water Use Efficiency	Assist Retail Agencies to achieve, or exceed, compliance with SWRCB Water Use Efficiency Standards <sup>4</sup>		
		GPCD target for 2030 <sup>5</sup>	GPCD target for 2035	GPCD target for 2045
	Greenhouse Gas Reduction	N/A	40% below 1990 emission levels by 2030	Carbon Neutral by 2045
	Surplus Water Management	Develop capability to manage up to 500 TAFY of additional wet year surplus above Metropolitan's Storage Portfolio and WSDM action		

**Figure 2-4 Time-Bound Targets**

### Notes

**1** Core Supply sub-targets will be considered later this year and may include targets for groundwater remediation and stormwater capture.

**2** This initial target includes existing (and under construction) local agency supplies and can be augmented later this year to include new local agency supply.

**3** Used to offset the need for additional core supply and using 2024 as a baseline.

**4** Each retail water supplier will report progress to the State Water Board annually through a Water Use Objective (WUO) equaling the sum of efficiency budgets for a subset of urban water uses: residential indoor water use, residential outdoor water use, real water loss and commercial, industrial and institutional landscapes with dedicated irrigation meters. Each efficiency budget is calculated using a statewide efficiency standard and local service area characteristics (population, climate, etc.).

**5** Specific GPCD Time-Bound Targets will be identified later this year based on final SWRCB standards as well as Metropolitan's overall demand management target. The target will be designed to track water use efficiency trends by sector over time and will take local conditions, including climate, into consideration.

## Time-Bound Targets defined

CORE SUPPLY	STORAGE	FLEX SUPPLY
Refers to resource management actions that augment supply or reduce Metropolitan demand and remain available each year and are based on the outcome of the IRP Needs Assessment, and which can be refined through the adaptive management process.	Refers to an asset that allows Metropolitan to capture water during times of surplus to use when it is needed. Can include surface storage, groundwater storage, or other. Values presented are based on the outcome of the IRP Needs Assessment, which can be refined through the adaptive management process	Includes resource management actions implemented as needed (e.g., water transfers, fallowing programs), including savings from deliberate efforts to change water use behavior.
LOCAL AGENCY SUPPLY	DEMAND MANAGEMENT	REGIONAL WATER USE EFFICIENCY
Includes existing (and under construction) local agency supplies and can be augmented later this year to include new local agency supply.	Target is used to offset the need for additional core supply and uses 2024 as a baseline.	Each retail water supplier will report progress to the State Water Board annually through a Water Use Objective (WUO) equaling the sum of efficiency budgets for a subset of urban water uses: residential indoor water use, residential outdoor water use, real water loss and commercial, industrial and institutional landscapes with dedicated irrigation meters. Each efficiency budget is calculated using a statewide efficiency standard and local service area characteristics (population, climate, etc.)  Specific GPCD Time-Bound Targets will be identified later this year based on final SWRCB standards as well as Metropolitan's overall demand management target. The target will be designed to track water use efficiency trends by sector over time and will take local conditions, including climate, into consideration
GREENHOUSE GAS REDUCTION	SURPLUS WATER MANAGEMENT	
Refers to goals for reducing the GHG emissions that are integrated into individual project or program considerations	Refers to management of water available under certain conditions, which exceeds what is required at the time to meet demands.	

**Additional Time-Bound Targets will be considered throughout 2024 and will include categories such as the following:**

**Community Equity:** Focus on investing in underserved communities, affordability measures and providing meaningful community engagement.

**New Local Supply:** Targets around local and member agency supply and/or program development.

**Water Quality:** Ensuring research, innovation, and progress in addressing emerging contaminants of concern and new regulatory requirements.

**Infrastructure Resilience:** Investments necessary to meet growing climate-driven vulnerabilities during and after disruptions.

**Imported Water Source Resilience:** Investment in protecting source watersheds and existing infrastructure to reduce risks presented by accelerated climate change.

**Ecosystem Health:** Measurable improvements to natural systems that provide value, resilience and regulatory benefits to water supplies.



**SECTION 3**

# Development of Adaptation Strategies

Section to be provided at a later date

# Business Model and Affordability

Section to be provided at a later date

# Policies, Initiatives and Partnerships

Section to be provided at a later date

# Adaptive Management

Section to be provided at a later date