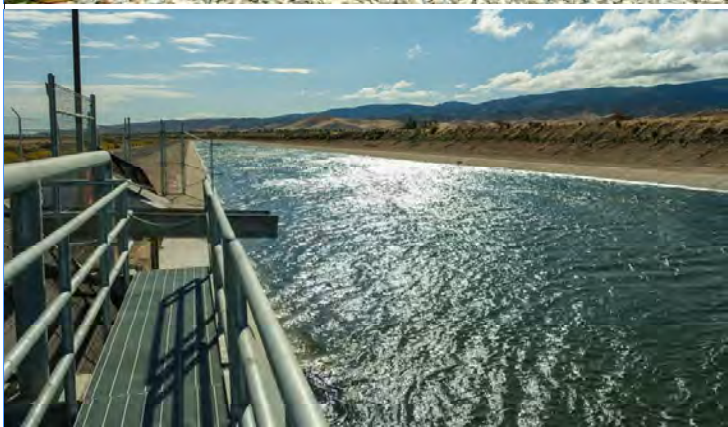
CAMP4W

Climate Adaptation Master Plan for Water

Year One Progress Report



Metropolitan Water District
of Southern California

MAY 2024

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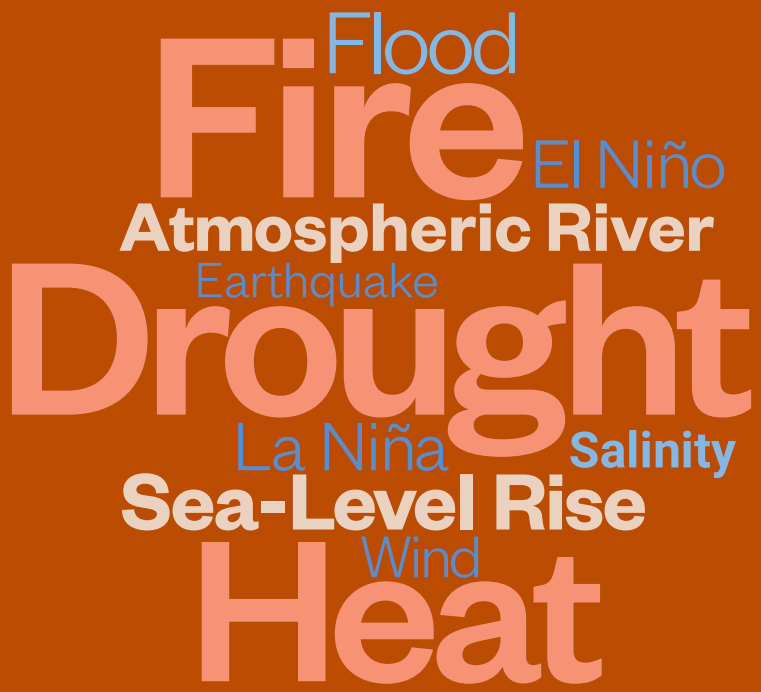
Adapting to Extreme Conditions brought on by a Changing Climate.



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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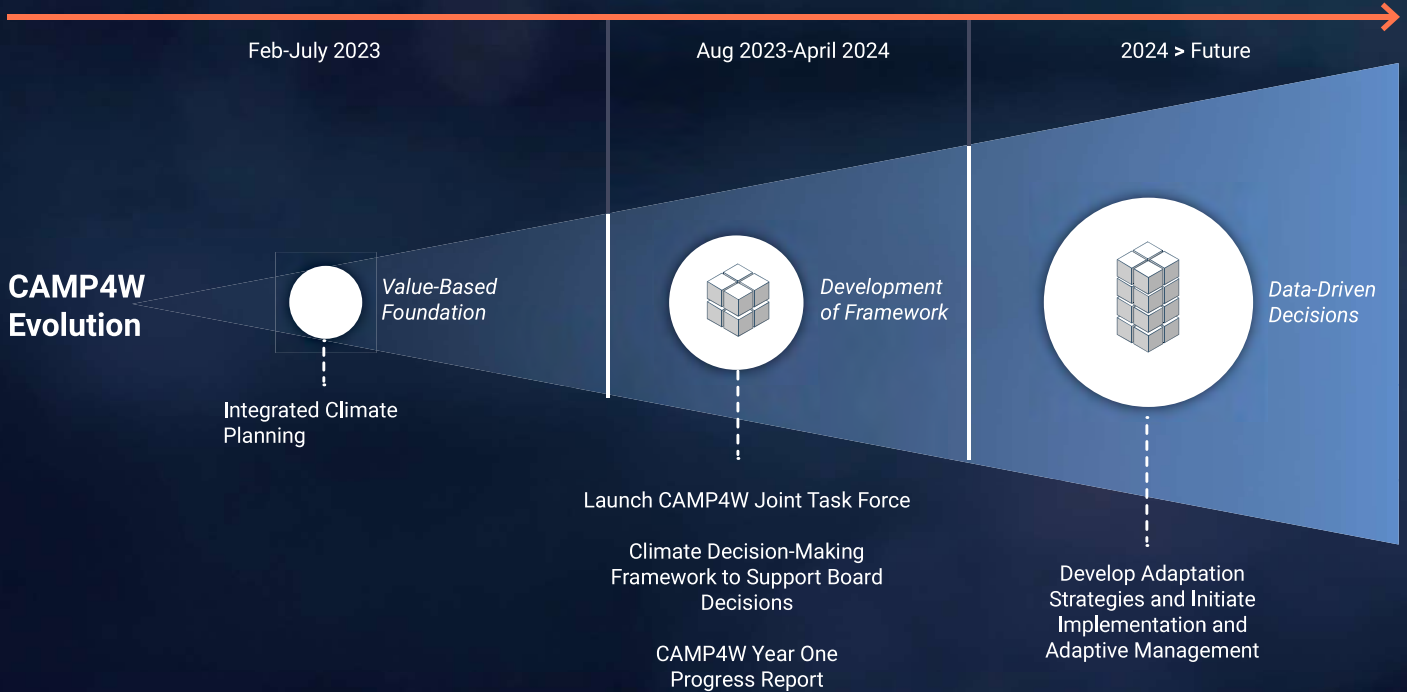
Executive Summary

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, water quality, infrastructure, operations, workforce, public health, 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

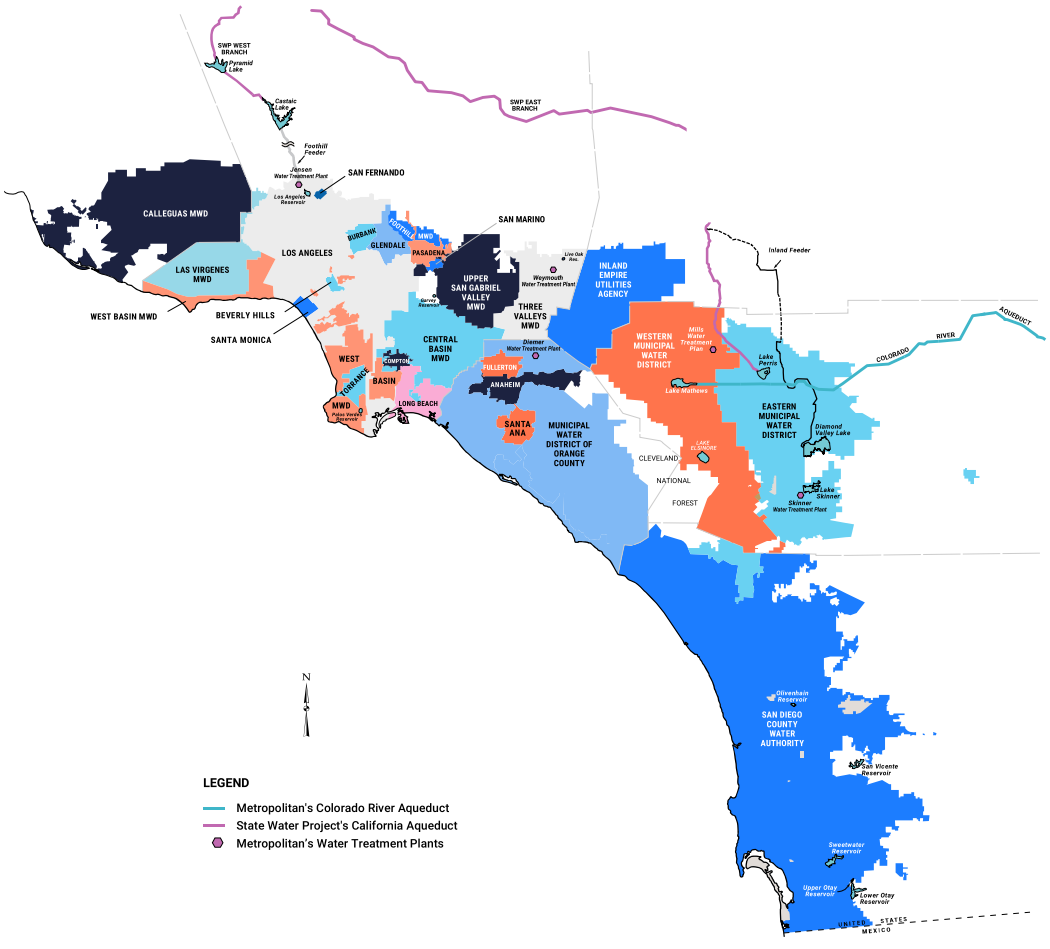
On November 21, 2023, Metropolitan's Board of Directors chartered a Joint Task Force of Board Members and Member Agency Managers to oversee the development of the CAMP4W process and Master Plan. CAMP4W was designed to include the following components:

- **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 near-, mid-, and long-term targets for core supply, flex supply, local agency supply, storage, equitable supply reliability, conservation, demand management and efficiency programs, 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 (1) the range of potential regional supply gaps among Member Agencies and (2) infrastructure or financial constraints.
- **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.

Reflecting the Values and Goals of the Joint Task Force through the CAMP4W Themes

Stronger together. Working collaboratively is a cornerstone of the CAMP4W process. The Task Force has committed itself to prepare Metropolitan and its Member Agencies for an uncertain future by developing a process for evaluating and prioritizing capital investments and programs that support a reliable and resilient supply of water resources. Founded on the themes of ***reliability, resilience, financial sustainability, affordability, and equity,*** CAMP4W will foster collaboration throughout the region by applying a "stronger together" approach.

Reliability	Resilience	Financial Sustainability	Affordability	Equity
Ability to consistently meet Member Agency water demands.	Ability to withstand and recover from disruptions.	Revenues sufficient to cover expenses over the short and long-term.	Relative cost burden and elastic ability to access (pay for) service and support Member Agency efforts to provide affordable supply to their customers.	Fair, just, and inclusive.



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 refine 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.

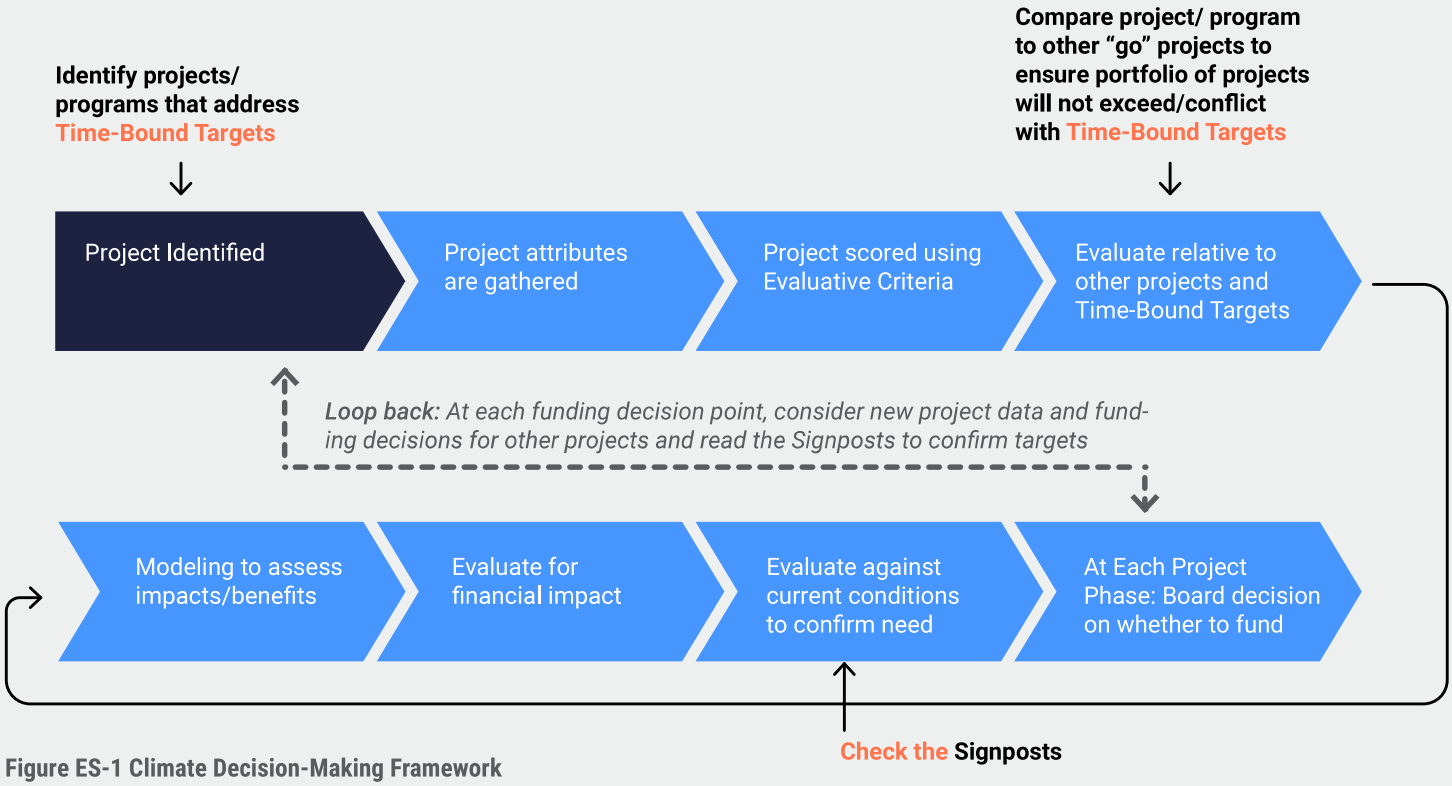


Figure ES-1 Climate Decision-Making Framework

Summary of CAMP4W Adaptive Management Approach

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. 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

The Evaluative Criteria represent 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. The scoring components within each Evaluative Criteria category will be refined over 2024, as will the points distribution presented below. Evaluative Criteria and the scoring process will consist of quantifiable, meaningful, and measurable metrics. This approach supports a data-driven evaluation process for projects and programs.

RELIABILITY 25 POINTS	**RESILIENCE** 25 POINTS	**FINANCIAL SUSTAINABILITY & AFFORDABILITY** 20 POINTS
Supply Performance Equitable Reliability	Addresses known vulnerabilities Project's ability to perform under climate impacts	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.	Assess a project's financial sustainability and affordability based on its unit cost.

ADAPTABILITY & FLEXIBILITY 10 POINTS	**EQUITY** 10 POINTS	**ENVIRONMENTAL CO-BENEFITS** 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 over the coming year. Section 2 presents additional categories of Time-Bound Targets that will also be explored. As part of the Adaptive Management process, the Time-Bound Targets may shift over time as modeling and other analyses are updated. The process and time frame for these updates will be refined over 2024, with the goal of providing an initial update by the end of 2024.

Resource-Based Targets
Numbers reflect additional supplies unless indicated otherwise

CATEGORY	NEAR TERM	MID TERM	LONG TERM
Core Supply[1]	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		

Policy-Based Targets

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[2]	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[3]	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[4]		
	GPCD target for 2030[5]	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. If the Board wishes to set a higher target, it would 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.

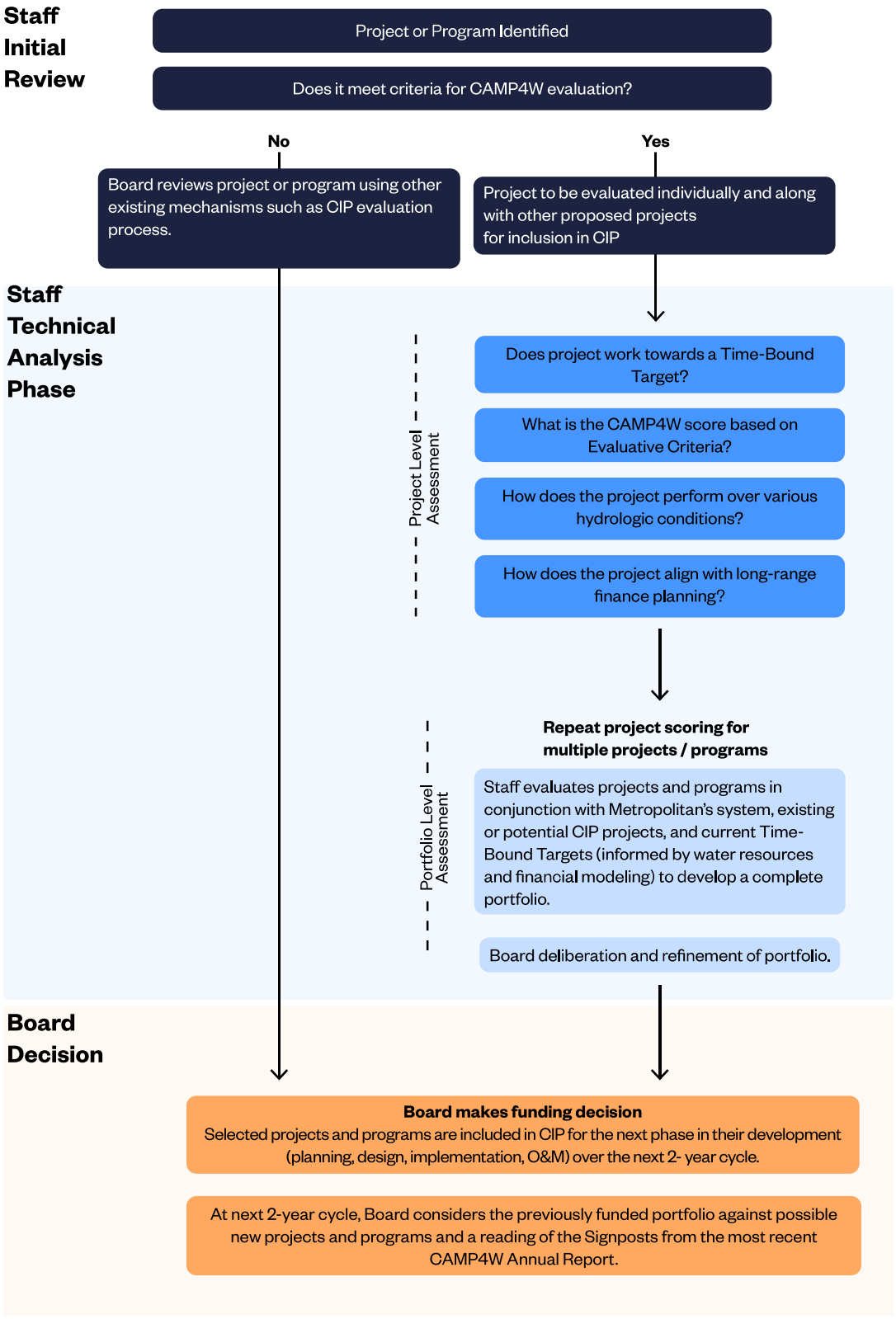
Proposed Signposts Metrics Examples
Signposts should be measurable, updatable, and readily available

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		Connectivity and Robustness	
		Infrastructure Capability	

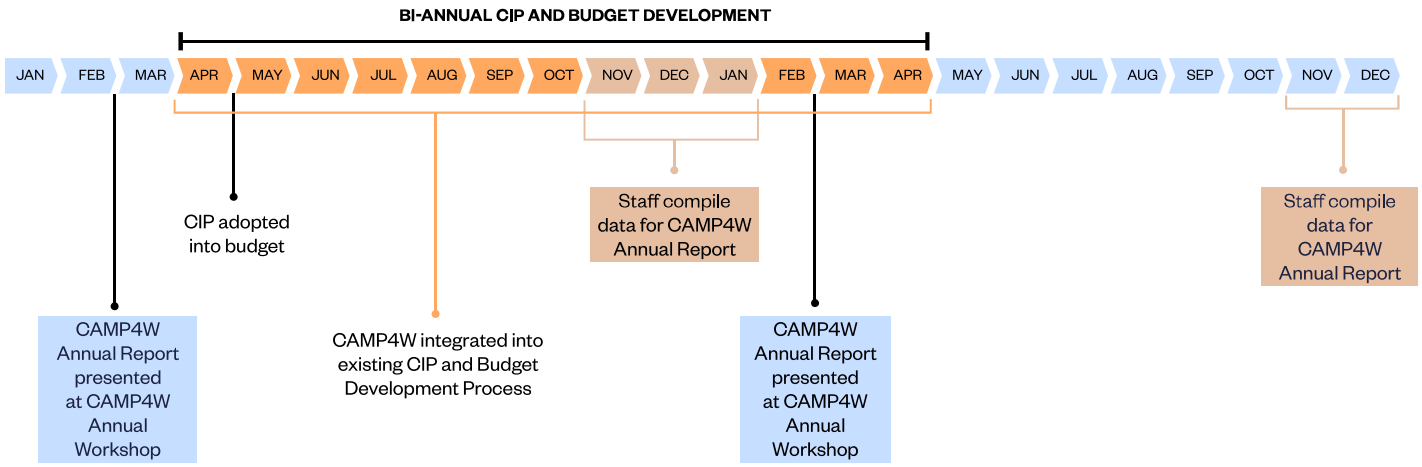
Annually, Metropolitan will "Read the Signposts" to provide the Board a summary of the current status of each Signpost. It will include a brief assessment of any trends and what the findings may indicate. This will help the Board with making investment decisions, evaluating progress and identifying any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

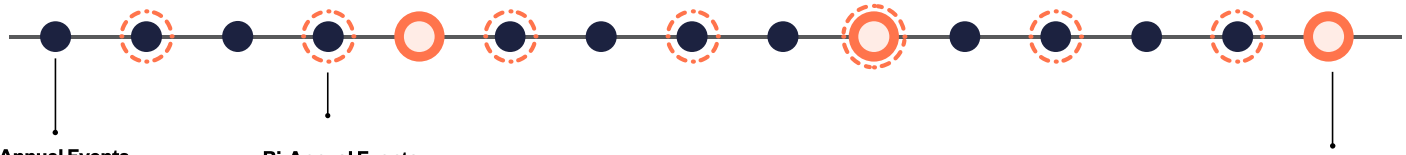
Board Deliberation Process

The Board deliberation process will be integrated into Metropolitan's existing processes while allowing for additional evaluation of CAMP4W projects and programs as outlined in the Climate Decision-Making Framework.



Integrating CAMP4W Into Metropolitan's Existing Processes





Annual Events

- CAMP4W Annual Report: includes updated data on demand, supply, infrastructure, and financial Signposts (and others to be identified over 2024) plus relevant project updates so the Board will regularly have the most up to date information to facilitate frequent and informed decision-making
- CAMP4W Annual Workshop
- Local Supply Updates

Bi-Annual Events

Water resources planning and development of budget, CIP and 10-yr forecast (CAMP4W integrated into existing process)

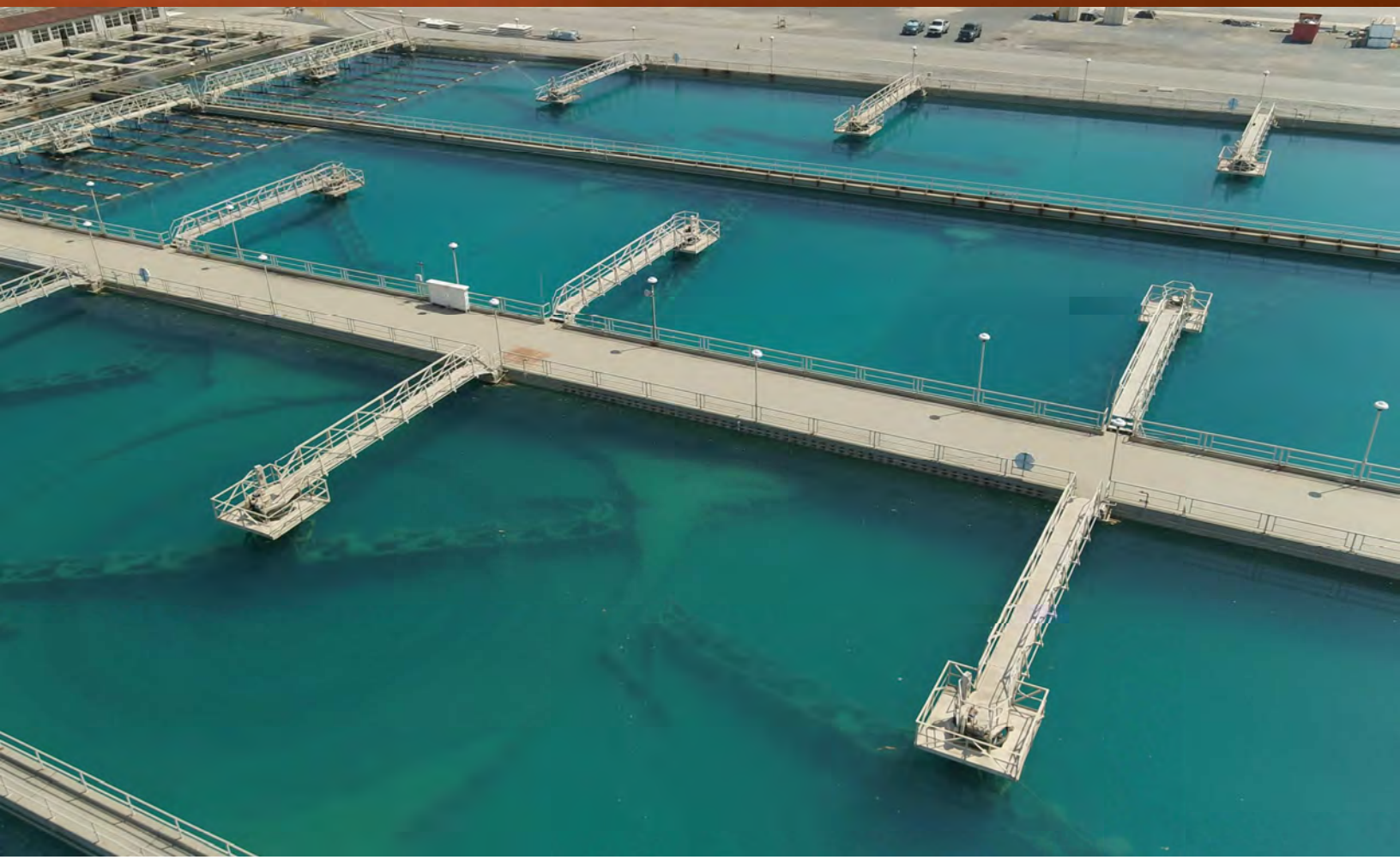
5-Year Events

Review and update CAMP4W investment decisions based on modeling updates (water resources, finance, and other)

Legend

Annual Events | Bi-Annual Events | 5-Year Events

Next Steps



Business Model

- Develop mutual understanding of current business model and objectives for refinement
- Establish the schedule for ongoing integration with the 10-year financial forecast
- Incorporate risk analysis into the Board's investment decision-making
- Consider business model alternatives
- Identify how Metropolitan can pursue options that advance affordability and equity goals

Policies, Initiatives, and Partnerships

- Develop and consider policies and initiatives
- Explore Metropolitan and Member Agency partnership opportunities
- Pursue external partnership and collaboration opportunities
- Continue community engagement

Adaptive Management

- Refine Adaptive Management and how to institutionalize it into Metropolitan's processes
- Further develop Signposts and specific metrics
- Develop CAMP4W Annual Report Template
- Refine process for integrating CAMP4W projects into CIP and budget
- Identify early "Go Projects" and program opportunities
- Continue development of dashboard and digital support tools

SECTION 1

CAMP4W Background, Need, and Outcome

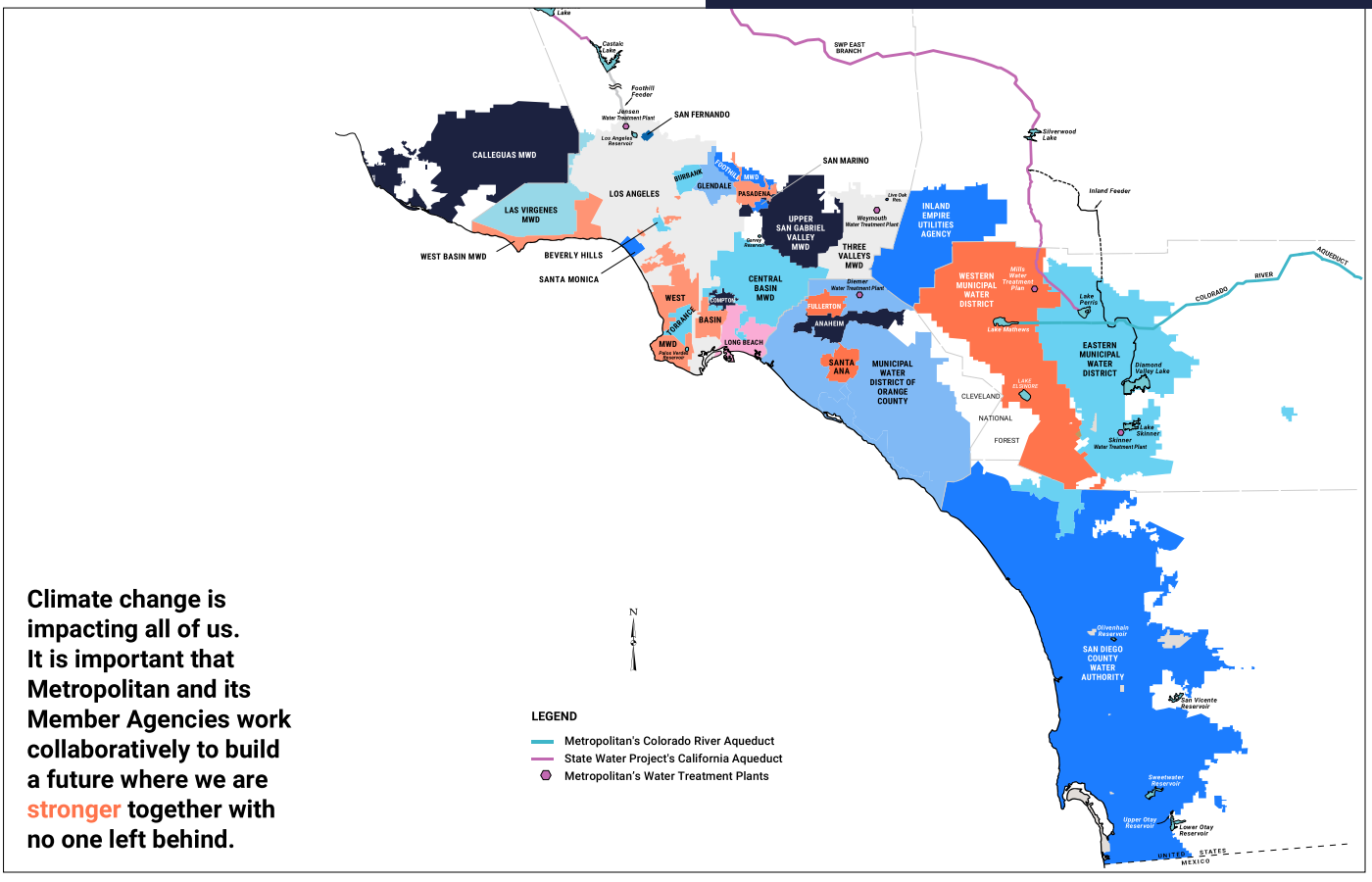
1.1 Summary of Metropolitan's System, Assets, and Member Agencies

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-Withy-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. For example, State Water Project dependent areas faced shortages during the recent drought due to supply shortage and infrastructure constraints, 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.

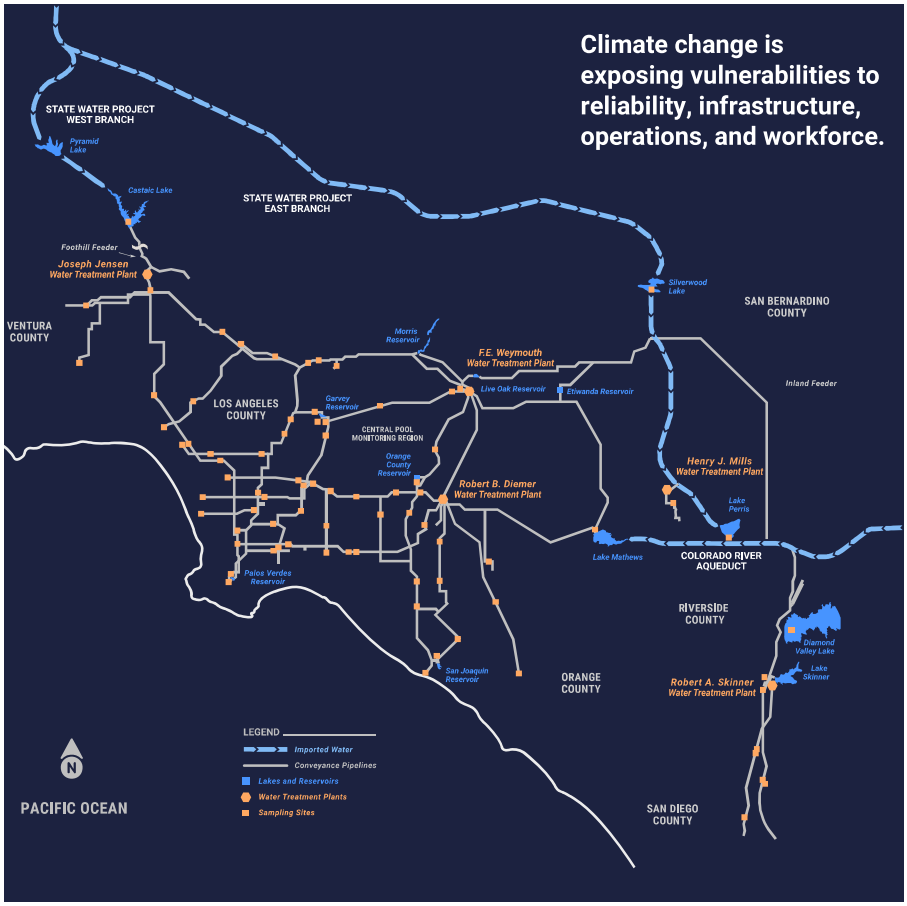


Climate change is impacting all of us. It is important that Metropolitan and its Member Agencies work collaboratively to build a future where we are stronger together with no one left behind.

1.2 Purpose and Need for Climate Adaptation Planning

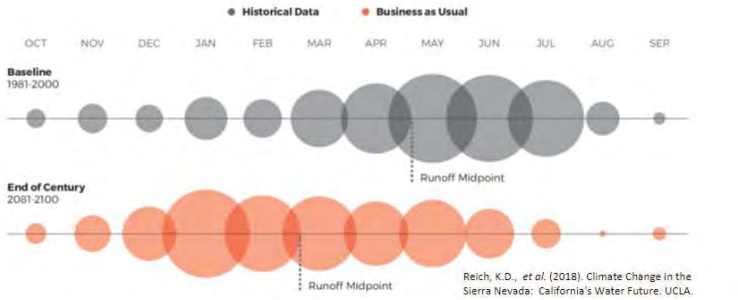
Worldwide, agencies are grappling with the reality that climate change is impacting our lives in a multitude of ways. Extreme weather events such as drought, flooding, wildfires, heat waves, and windstorms, as well as sea level rise and the compounded impacts of climate change on other hazards such as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

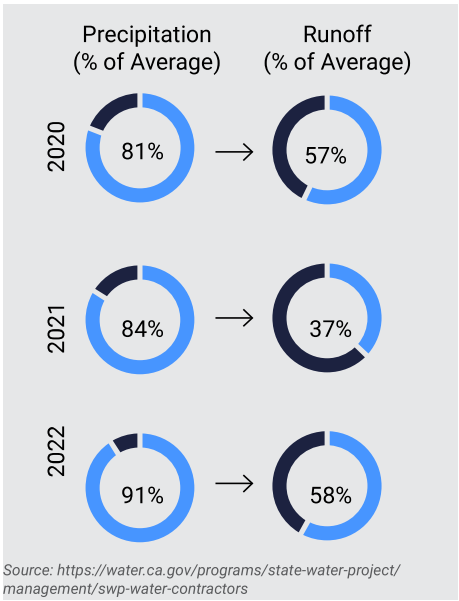
Preparing for the future and providing a reliable supply of water to its Member Agencies is not new to Metropolitan. What the CAMP4W process addresses is the need to put climate change at the forefront, to intentionally look at all aspects of Metropolitan's system through that lens, and to recognize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



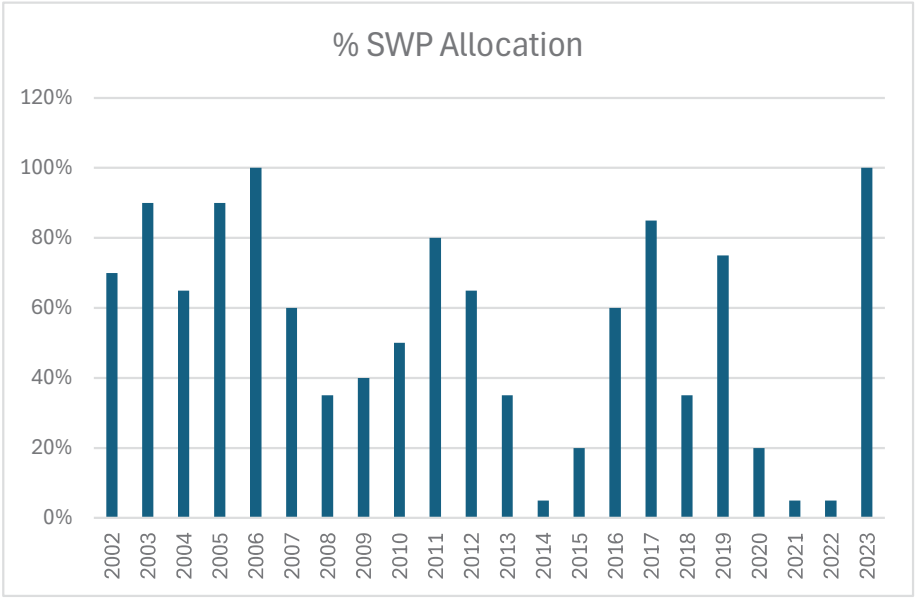
IMPACTS TO RUNOFF: CLIMATE CHANGE STRESSES THE WATERSHEDS FEEDING OUR STORAGE

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





Source: https://water.ca.gov/programs/state-water-project/management/swp-water-contractors

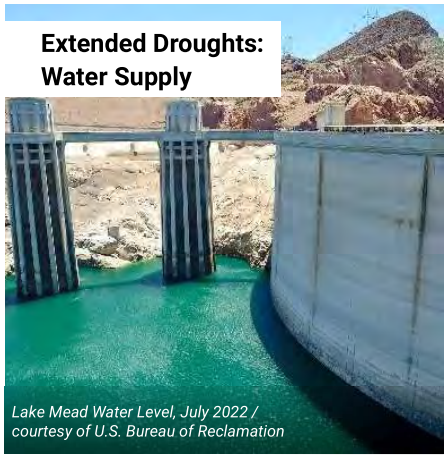


Reliability of runoff efficiency and supplies are decreasing

Impacts Beyond Drought

Metropolitan faces many challenges operating in a changed climate.

Extended Droughts: Water Supply



Lake Mead Water Level, July 2022 / courtesy of U.S. Bureau of Reclamation

Both of Metropolitan's major imported water sources, the Colorado River and the Northern Sierra, are threatened by extreme and extended droughts.

Sea-level Rise: Water Quality

Rising tide levels encroach into Bay Delta, December 2020 / courtesy of CA Department of Water Resources

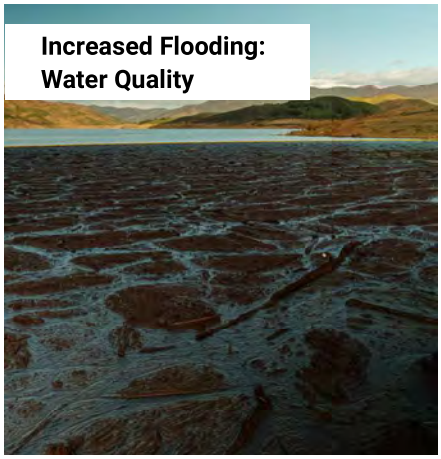
Increased salinity associated with sea-level rise could impact water quality in the Sacramento-San Joaquin Delta, as well as in coastal water basins situated throughout Metropolitan's service area.

Increased Flooding: Infrastructure Damages

Storm damage to CRA turnout infrastructure near Whitewater, February 2019

Major rain and flooding events can damage Metropolitan's delivery and storage system, such as when Tropical Storm Hilary caused a suspension in deliveries to DWCV storage in 2023.

Increased Flooding: Water Quality



Major rain and flooding events also create water quality concerns, such as the increased turbidity of inflows to Metropolitan's Jensen Water Treatment Plant from Castaic Lake in January 2023.

Wildfires: Infrastructure Damages

Wildfires can threaten Metropolitan's water treatment facilities and delivery systems, such as when the Freeway Complex Fire broke out in proximity to the Diemer Water Treatment Plant in November 2008.

Reduced Snowpack: Water Supply

DWR staff conduct recent snow survey, January 2024 / courtesy of CA Department of Water Resources

Reduced annual snowpack threatens the long-term sustainability of Metropolitan's two major sources of imported water, the Colorado River and the Northern Sierra.

Extreme Heat: Workforce Impacts

In addition to its damaging impacts on Metropolitan's existing infrastructure, extreme heat also threatens the health and safety of field staff across our service area.

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.

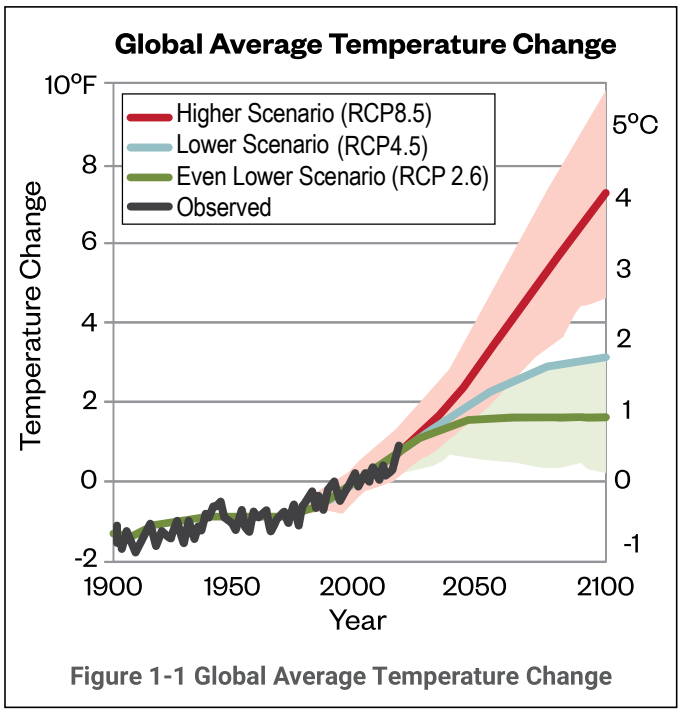


Figure 1-1 Global Average Temperature Change

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

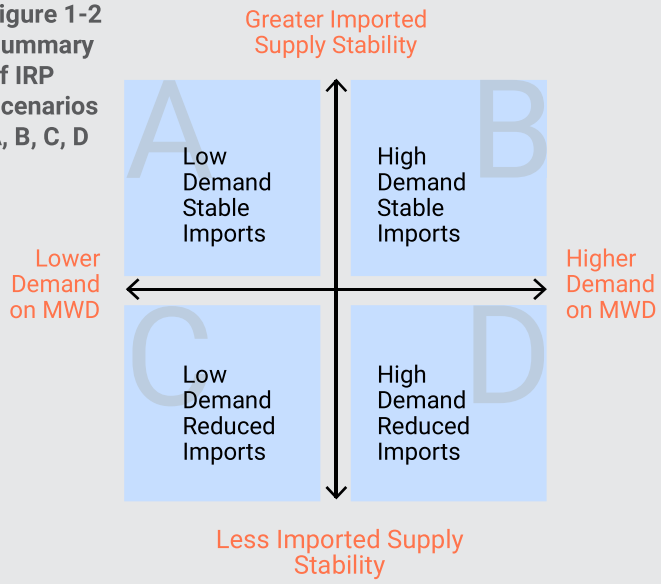
** TAF=thousand acre-feet; 1 acre-foot is the amount of water that would cover an acre of land at 1-foot depth*

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.

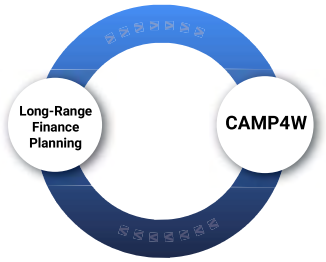
By adapting and modifying investment decisions over time, **Metropolitan will align implementation with real-world conditions** to reduce the risk of over or under developing resources.

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



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) builds upon the IRP Needs Assessment and is consistent with the goals and objectives of the CAMP4W process pertaining to resilience, reliability, financial sustainability, affordability, and equity.



Iterative process: Ongoing and iterative financial planning will be integrated with CAMP4W so as to incorporate updated resource needs and inform investment decisions.

THE LONG-RANGE FINANCE PLAN – NEEDS ASSESSMENT

The LRFP-NA provides high-level guidance on the rate impacts and funding opportunities and 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. Ongoing long-term finance planning will be an integrated part of the CAMP4W process.

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 Strategic Infrastructure Resilience Plan (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. The 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 on November 21, 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.

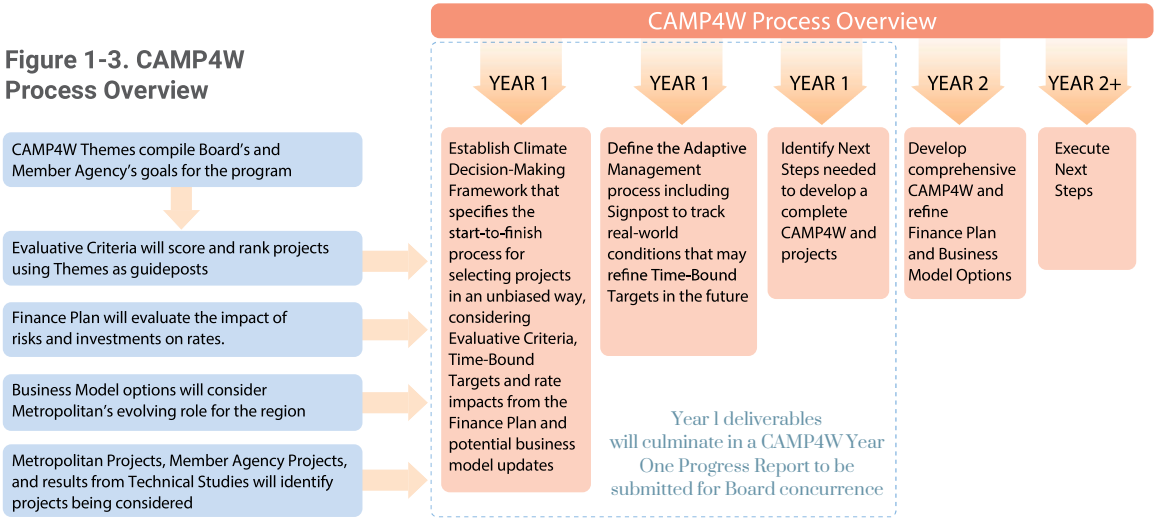
CAMP4W involves a multi-year iterative process in which various aspects of the process build upon one another (Figure 1-3). The initial development tasks outlined for the Task Force includes the development of this report through April 2024. The development of the remaining CAMP4W components will continue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

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.

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

- Increase the resilience 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 Metropolitan/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.

Figure 1-3. CAMP4W Process Overview



SECTION 2

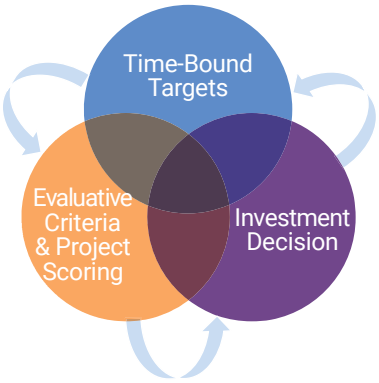
Climate Decision-Making Framework

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 and Time Bound Targets (discussed in this section) and Signposts (discussed in Section 6).

Part of the Decision-Making Process

Time-Bound Targets guide project development and inform scoring of projects

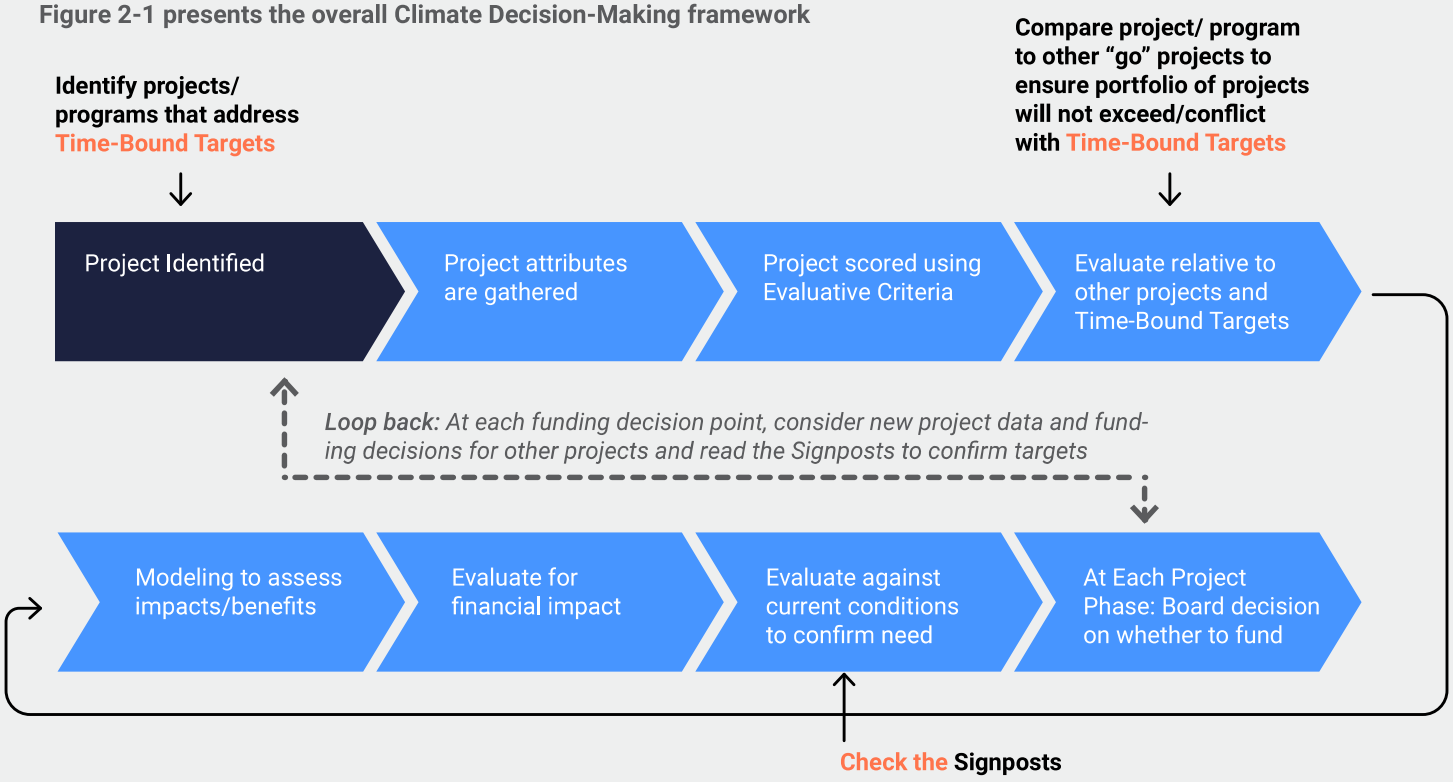


Adaptive Management

1. Provides a framework for decision support through time.
2. Iterative process over time to balance the risk of shortage and overinvesting.
3. Updates resource development needs and Time-Bound Targets based on updated projections and Signposts

▼ Signposts inform how conditions are changing

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, such as at 5-year intervals as discussed in Section 6, or 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. 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)

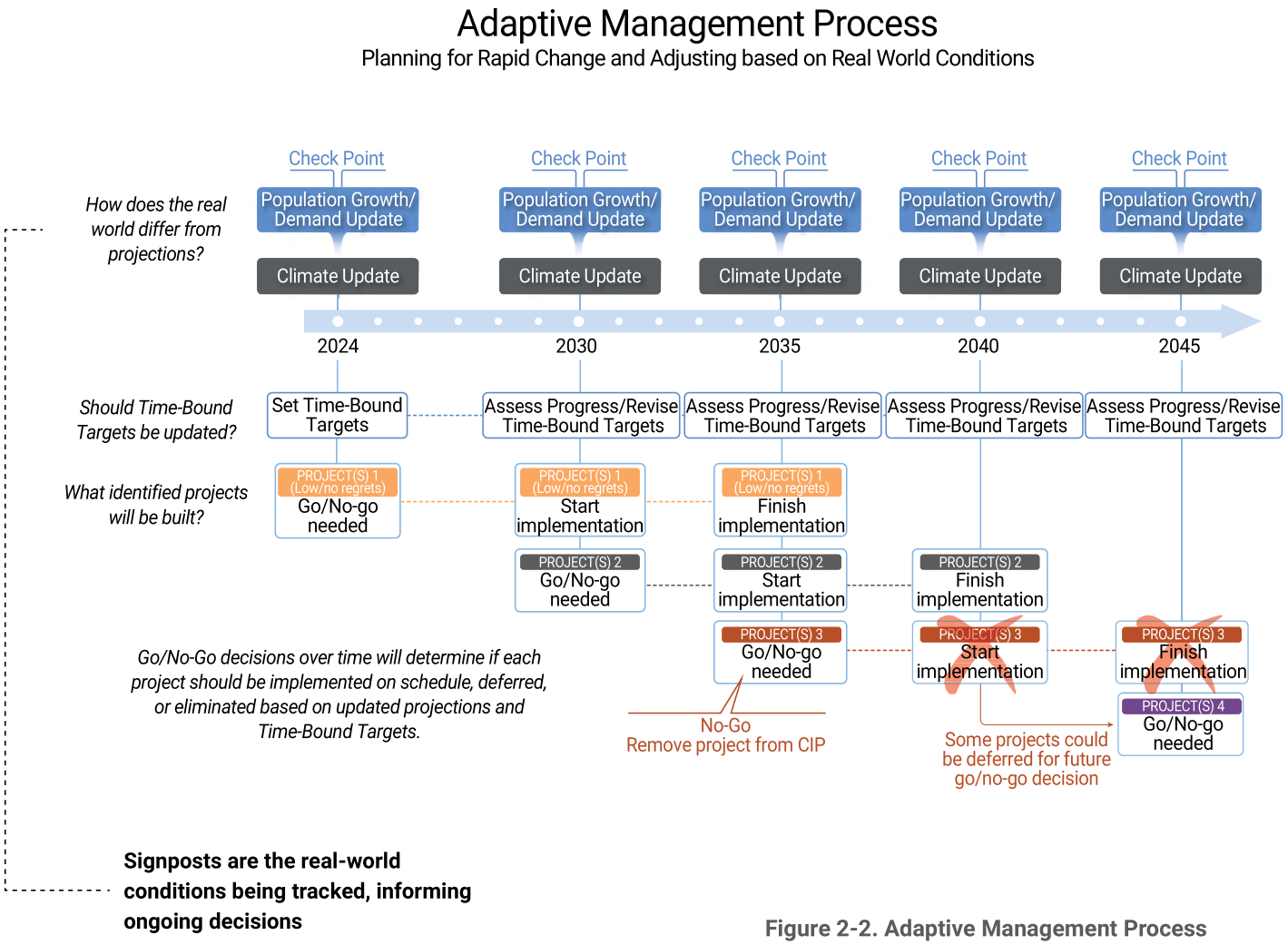


Figure 2-2. Adaptive Management Process

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. The scoring components within each Evaluative Criteria category will be refined over 2024, as will the points distribution presented below.

Evaluative Criteria and the scoring process will consist of quantifiable, meaningful, and measurable metrics. This approach supports a data-driven evaluation process for projects and programs.

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

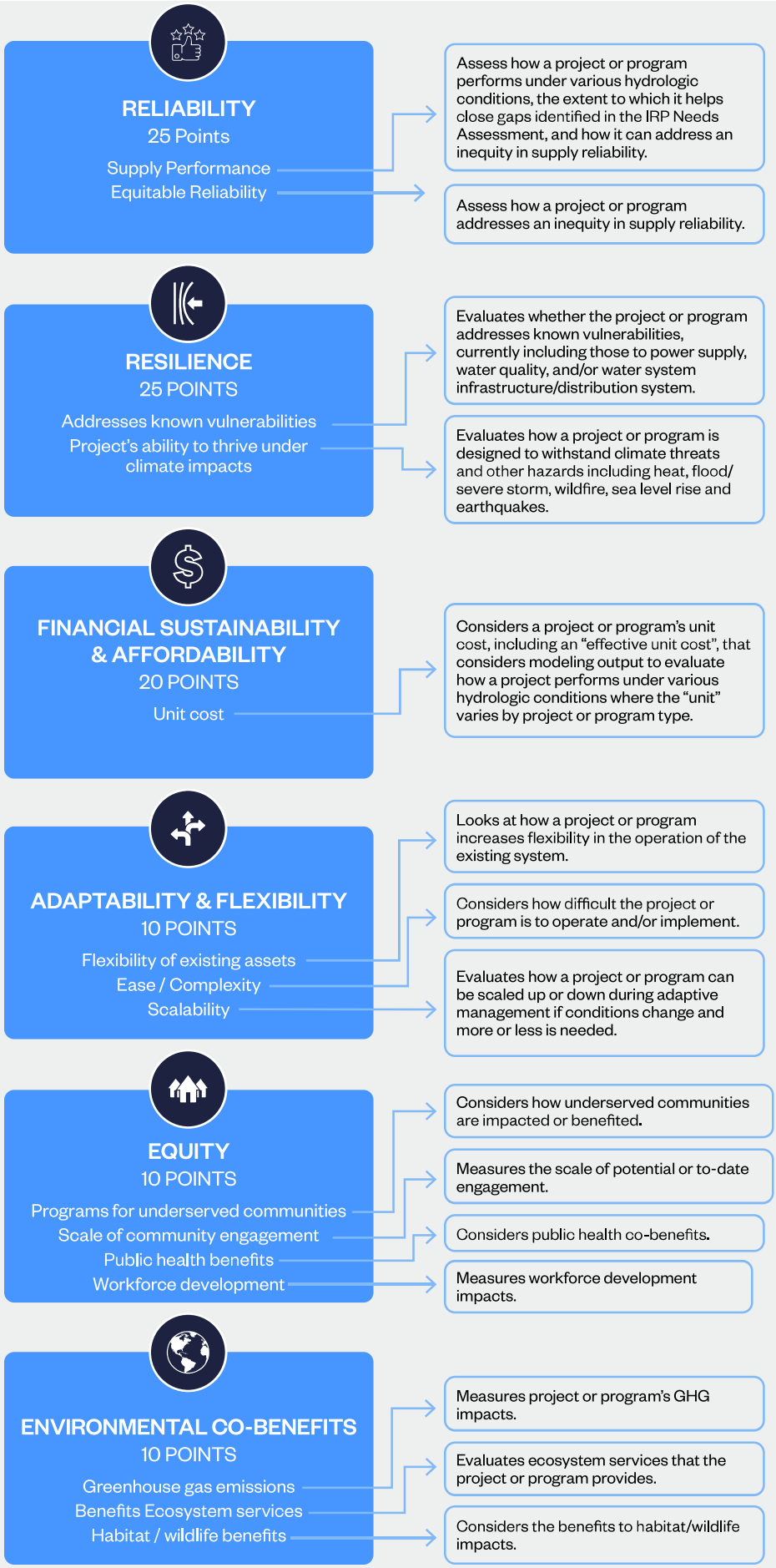


Figure 2-3. Evaluative Criteria

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, such as those presented below. As part of the Adaptive Management process, the Time-Bound Targets may shift over time as modeling and other analyses are updated. The process and time frame for these updates will be refined over 2024, with the goal of providing an initial update by the end of 2024.

Resource-Based Targets
Numbers reflect additional supplies unless indicated otherwise

CATEGORY	NEAR TERM	MID TERM	LONG TERM
Core Supply[1]	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		

Policy-Based Targets

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[2]	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[3]	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[4]		
	GPCD target for 2030[5]	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. If the Board wishes to set a higher target, it would 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

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.

STORAGE

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

FLEX SUPPLY

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

Includes existing (and under construction) local agency supplies and can be augmented later this year to include new local agency supply.

DEMAND MANAGEMENT

Target is used to offset the need for additional core supply and uses 2024 as a baseline.

REGIONAL WATER USE EFFICIENCY

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

Refers to goals for reducing the GHG emissions that are integrated into individual project or program considerations

SURPLUS WATER MANAGEMENT

Refers to management of water available under certain conditions, which exceeds what is required at the time to meet demands.

EQUITABLE SUPPLY RELIABILITY

Targets to address a known inequity in supply reliability, such as those identified in the August 16, 2022 Board resolution and ensuing commitment to regional reliability.

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

3.1 Development of Adaptation Strategies

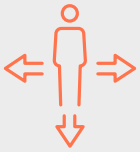
The CAMP4W themes and Time-Bound Targets form the foundation in the selection of projects and programs to be considered for CAMP4W evaluation. They may be projects for new or improved infrastructure or rehabilitation and repair (R&R) with climate adaptation enhancements. They may also be programs to improve resource management or increase structural conservation, that do not have an infrastructure component. The CAMP4W process has been designed to evaluate projects and programs that are intended to address climate adaptation needs. Because of this, not all projects that require Board approval will go through the CAMP4W process. Projects needed to maintain existing infrastructure and those that are not related to climate resilience will not be required to go through the process. However, the Board may request a CAMP4W evaluation if it would help inform their approval decisions. The distinction will be refined through the CAMP4W process over 2024.

Capital Projects: Every two years, the Metropolitan Board approves a biennial budget which includes its Capital Investment Plan (CIP). The CIP prioritizes needed capital investments to support core infrastructure refurbishment and replacement work, along with key additional initiatives like drought mitigation portfolio projects and sustainability initiatives. As part of Metropolitan's biennial budget process, Engineering Services Group develops a recommended two-year budget and expenditure plan for the CIP using a rigorous evaluation process that includes a risk analysis to identify and prioritize projects for implementation. During the CIP development process, all new and existing projects are evaluated against an objective set of criteria to ensure existing and future capital investments are aligned with Metropolitan's priorities for water supply reliability, water quality, and public safety.

The CIP evaluation criteria cover four characteristics or objectives for capital projects: Project Justification, Directive, Service Disruption, and Cost/Sustainability/Customer Service. In addition, a multiplier is applied to a project rating to factor in a risk assessment. For the evaluation, **a CIP Evaluation Committee comprised of staff from Operations, Water Resource Management, Real Property, Engineering Services, Finance, Information Technology, Environmental Planning, Safety & Regulation, and External Affairs** evaluate and score all project proposals. An iterative process is employed to first score and rank every new and existing project, and then solicit feedback

Characteristics or Objectives for Metropolitan Capital Planning

Project Justification



Directive

Service Disruption

Cost/Sustainability/Customer Service

from project sponsors, resource providers, and management to establish schedules and cash flow requirements. The resulting CIP for the upcoming two-year cycle comprises a mix of projects supporting Metropolitan's strategic plan and financial targets.

Replacement and Refurbishment Projects: System related tasks, such as conveyance pipeline or pump station repairs and other activities such as system-wide paving and roofing are categorized as replacement and refurbishment (R&R) projects. Many projects are non-discretionary and are timed for implementation to ensure continued operational function. Thus, CAMP4W evaluations will focus on investments aimed to meet CAMP4W resource-based and policy-based projects, as well as those projects or programs beyond an identified threshold that are designed to address a known climate vulnerability.

The CIP adopted for FY 2024/25 and 2025/26 includes ten programs ranging from Climate Adaptation and Drought Mitigation for SWP dependent areas to programs focused on elements of Metropolitan's regional water system including Dams and Reservoirs, Treatment Plant Reliability, and Water Quality. Projects within each program include new infrastructure as well as R&R. The Climate Decision-Making Framework (including the Evaluative Criteria developed through the CAMP4W process) will be used to evaluate investments that go beyond identified R&R needs. The intention is to not create a new or separate CIP timeline and process for CAMP4W evaluated projects, but rather to integrate CAMP4W evaluations into the existing CIP and budget approval process and timeline. Section 6 presents a discussion on the timeline and process that CAMP4W will be integrated into.

An important outcome of the CAMP4W planning process includes establishing the threshold that determines whether a project or program will be evaluated under the CAMP4W process. Some projects that are of a certain type or size will continue to be evaluated through Metropolitan's established CIP process while others will be evaluated under CAMP4W. Both evaluation pathways will lead to one comprehensive CIP.

Programs and Non-Capital Projects: Metropolitan is continually considering programs and projects to improve water and energy resource management and conservation. Examples include groundwater banking, conjunctive use, power sourcing, water efficiency direct install programs and more. These may not have associated infrastructure or physical assets and would not be evaluated within the CIP process. Nevertheless, they can be powerful climate adaptation strategies and will be considered within the CAMP4W process.

Urgent and/or Emergency Projects: The CAMP4W process is not intended to hinder the existing process for pursuing and implementing projects of an urgent or emergency nature, as will be further defined over 2024.

Focusing the projects and programs to be evaluated through the CAMP4W process allows the Board to make informed investment decisions that improve Metropolitan's adaptation to a changing climate and future uncertainty.

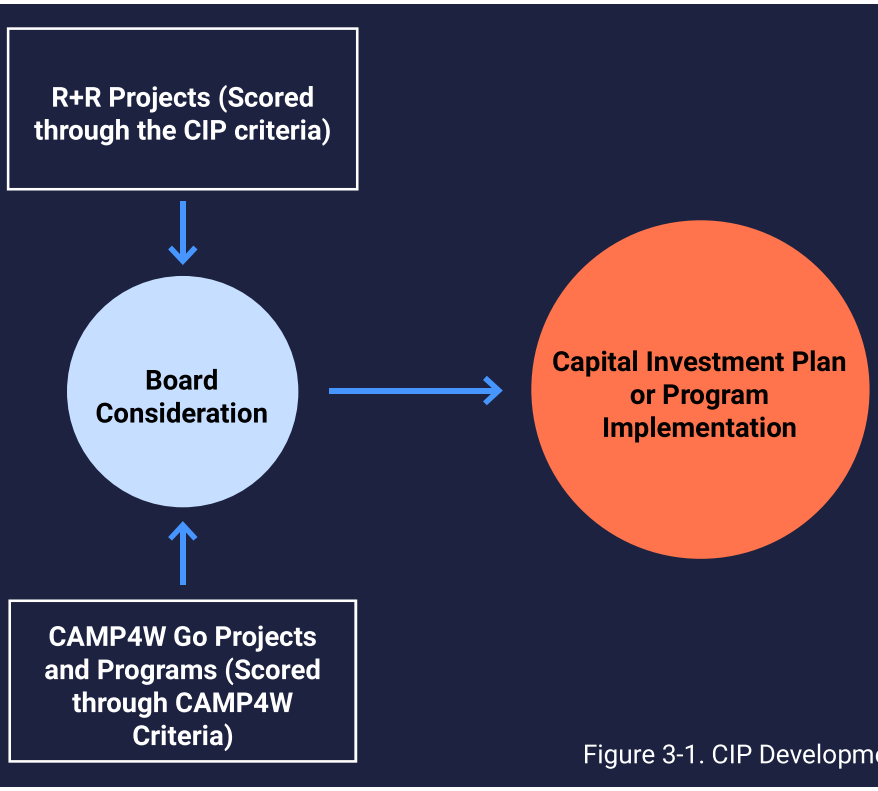


Figure 3-1. CIP Development

3.2 Project and Program Evaluation Process

Determining which Metropolitan project and programs will be evaluated through the CAMP4W Climate Decision-Making Framework will be a collaborative process for staff.

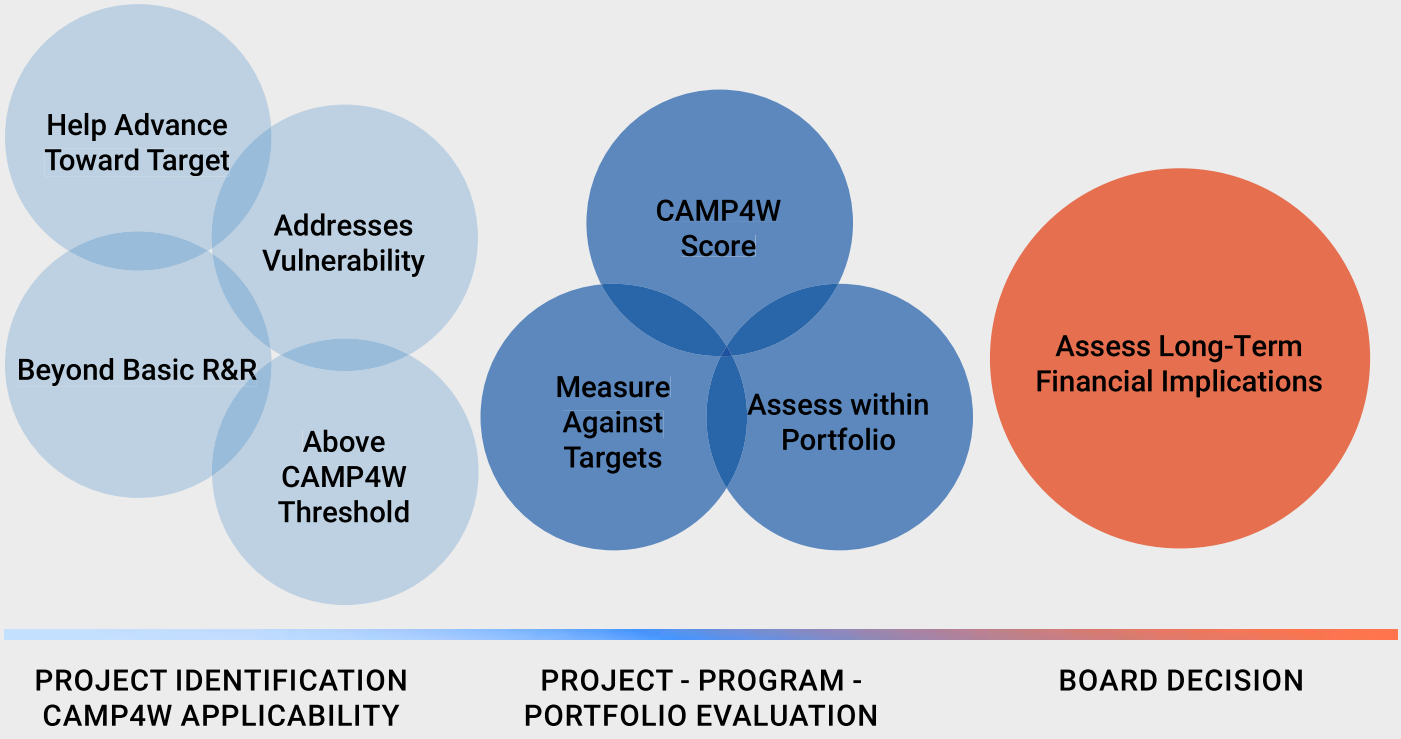
Once a proposed investment is identified as a CAMP4W project or program, it will be scored using the Evaluative Criteria, which were designed to focus investments on the guiding principles of the CAMP4W process: Reliability, Resilience, Financial Sustainability, Affordability and Equity. Using Metropolitan's system and financial models, project scores will be developed to reflect assessments of Metropolitans existing system and modeled future conditions. It will also reflect potential financial impacts over time. These elements are laid out below.

Figure 3-1 presents an overview of the Board deliberation process for evaluating projects, programs, and portfolios, which is further discussed below.

DETERMINING CAMP4W CONSIDERATION

A "yes" answer to any of the following three questions means a project or program will be considered through the CAMP4W process.

- Is the project or program providing a new core supply, flex supply, or storage, or is the project supporting a new core supply, flex supply or storage project?
- Is the project or program addressing a known vulnerability to an asset(s) and does it involve improvements beyond what would be required to perform traditional R&R for that asset?
- Does the project or program work towards meeting a Time-Bound Target?
- Does the project or program exceed a certain flow based threshold (CFS or AFY) or cost threshold (capital or O&M cost)?



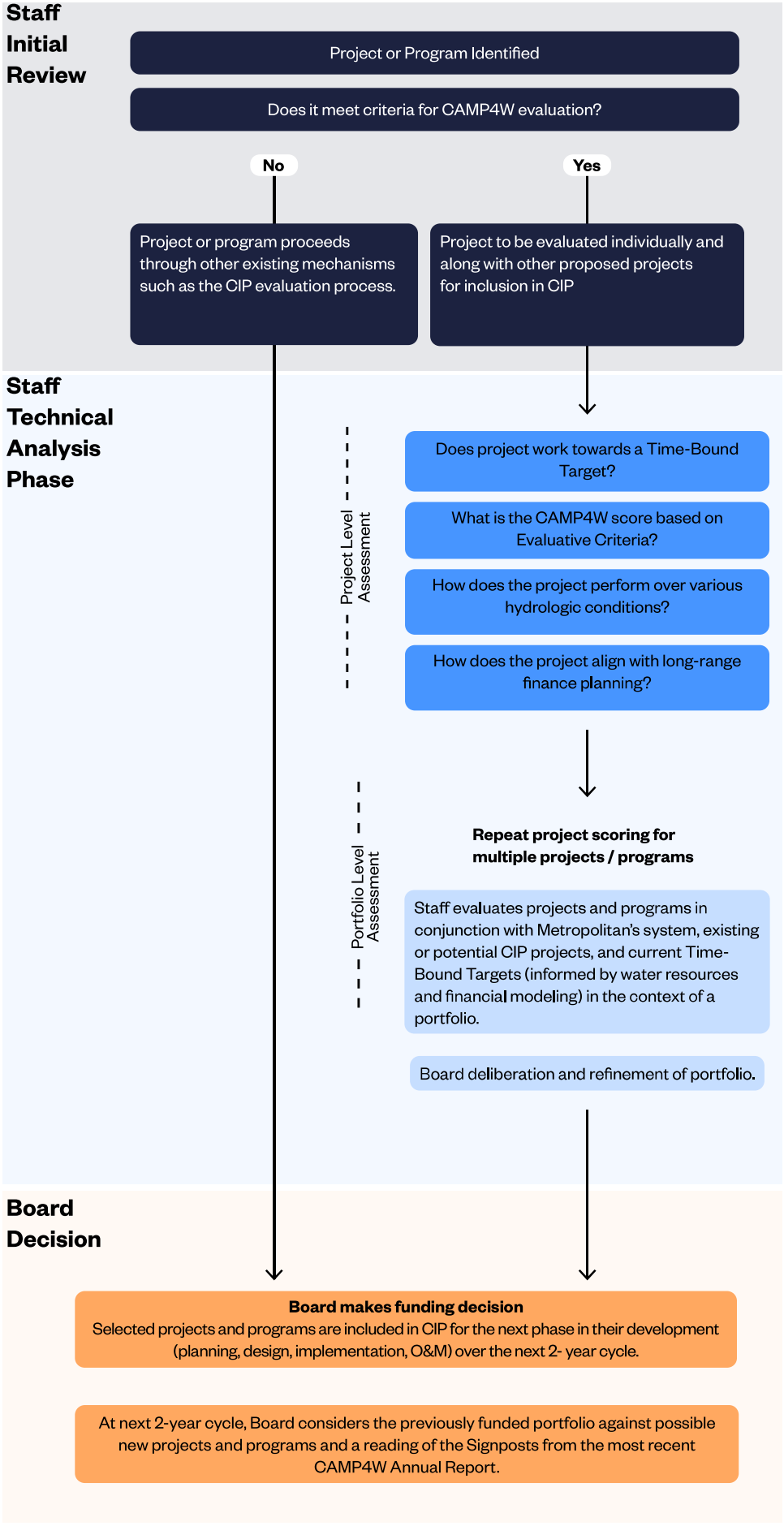
Modeling outputs will work together with the Evaluative Criteria, Time-Bound Targets, and Signposts described in Sections 2 and 6. Once a supply or storage project is identified as a potential opportunity, it will be modeled using Metropolitan's system model. This will estimate the project's benefits over time, which can be referred to as its "effective yield" – meaning the amount of water it would be expected to supply given factors such as fluctuating rainfall patterns or other factors. These values will be part of the scoring process using the Evaluative Criteria. Modeling outputs will also be used to demonstrate how a project is helping reach the Time-Bound Targets. Finally, during the ongoing adaptive management process, when Signposts are read and modeling assumptions are adjusted, the Board will be able to see how the project is expected to perform based on refined real-world conditions. This will allow the Board to revise investment decisions at each phase of a project or program as new information that impacts its benefit and performance becomes available.

3.2.1 Portfolio Evaluation

Considering projects and programs as part of a portfolio will allow Metropolitan to understand the overall benefits of each project component as it relates to the whole. Staff will provide project and program evaluations as standalone evaluations along with a view on how a particular project or program would function within a portfolio. This provides a deeper understanding of the project or program's benefits and costs. Evaluating proposed projects and programs in portfolios addresses two key questions:

Question 1: How will multiple potential supply and storage projects complement or interfere with one another?

- The Board will need to understand how potential supply and storage projects function together. If two projects address the same issue and do not complement one another, this is valuable information that will help Metropolitan understand that this is an "either/or" decision point.
- The Board will need to understand when a project is not a standalone project. Some examples include:
  - A storage project that requires a conveyance pipeline, pumping stations, and a new supply of energy. These could be considered separate project, but to fully understand the investment commitment, these projects should be evaluated together.
  - A supply project that would only make sense if a separate conveyance project was built. If the conveyance project is being considered separately, it would be critical to understand that the benefits from the new supply would only be seen if the conveyance project is built.



Question 2: How do projects that are not directly related to new supply or storage elements fit into the whole?

- Projects that improve system resilience and address a known vulnerability should be included in portfolios to create system wide reliability and resilience.
- Variability in the timing and development of different projects may not allow complete portfolios to be scored using the Evaluative Criteria, but providing the context of portfolios for projects and programs under consideration will provide a more comprehensive look at the benefits, risks, and true costs of proposed investments.

Metropolitan will continue to collaborate with Member Agencies, who have an in depth understanding of their local supplies, projects, programs and potential solutions.

PORTFOLIO: A GROUPING OF PROJECTS TO BE EVALUATED TOGETHER TO UNDERSTAND HOW THEY INTERACT

To the extent that a sufficient number and variety of projects are available to evaluate simultaneously at any given time, considering projects and programs in the context of portfolios will allow Metropolitan to see how they do or do not work together. By combining a portfolio evaluation with system modeling, we will be able to best understand what projects and programs can deliver the best results. As discussed in Section 6, CAMP4W projects/programs and portfolios will also be evaluated through the CIP and budget process to ensure comprehensive integration with all of Metropolitan's activities.

3.2.2 Assess Long-term Financial Implications

Affordability and financial sustainability are key themes identified by the Board that guide the CAMP4W process. It is critical that the financial impacts of any proposed project or program be understood as part of the evaluation process as they can have significant impacts on Metropolitan, its Member Agencies, and ultimately retail customers.

As is further described in Section 4, Metropolitan is developing a Long-Range Finance Plan (LRFP). A key outcome of this effort is the development of a financial model that allows the Board to understand the financial impacts of new projects and programs. Evaluating projects and programs through this lens will help Metropolitan remain financially sustainable and as affordable as it can.

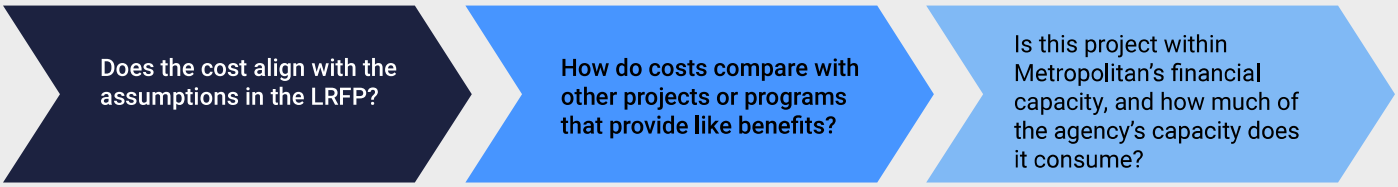
The scoring process and Evaluative Criteria discussed in Section 2 recognize the importance of considering financial impacts of projects early on and throughout the adaptive management process. Unit cost is is the financial metric identified in the Evaluative Criteria. While Unit Cost is anticipated to be the financial metric used to score an individual project or program, Debt Leverage is expected to be a primary financial metric when evaluating a portfolio-view.

Unit Cost includes both the cost per acre-foot of supply or storage, or the cost per unit for other projects or programs that are not supply or storage-related. This flexibility in the "unit" definition allows this metric to be utilized in a consistent manner against projects or programs of a similar type. Tracking the "effective unit cost" is important to consider in the evaluation of a project or program. The effective yield of a project (based on modeling outputs) as opposed to the gross yield or design capacity, is most relevant as the effective yield can vary based on hydrologic conditions, project share among participants, or other factors. While total costs will be documented, for the purpose of CAMP4W analysis, unit costs will reflect the cost to Metropolitan as opposed to total unit cost.

The financial metric that will be integrated into the Evaluative Criteria includes unit cost. Full financial evaluation will be integrated by including the CAMP4W process in Metropolitan's existing budget development process.

When an identified project cost falls within the range of unit costs assumed in the LRFP, a project score will positively reflect this. Where a project is more costly than the LRFP assumed unit costs, additional evaluation will be required to determine if the project should be considered further. This evaluation would include consideration for other multi-benefits the project brings, exploration of alternative projects that address the need at a lower cost, and how critical the need for the project is. When a project is to be considered further, its financial impacts will be evaluated as part of the Climate-Decision Making Framework.

Debt Leverage



Debt Leverage focuses on (a) how much of Metropolitan's forecasted bond capacity a project and/or program would utilize; and (b) the projected annual debt service coverage requirements on the aggregate debt issued. Whether a project or program is eligible to be funded through bonds can have a significant impact on Metropolitan's short- and long-term costs. The ability to bond finance a project allows for generational equity – whereby current and future rate customers, who enjoy the benefits of a project or program, will pay their "fair share" of the associated costs. When aggregating projects and programs into a portfolio to address Metropolitan's overall reliability and resilience objectives, it is important to understand the combined financial costs and constraints. This financial metric will aid in determining the relative cost burden of a portfolio while meeting certain minimum annual debt service coverage thresholds. The combination of these two debt metrics (in addition to unrestricted reserve balances) reflect the key credit factors that impact Metropolitan's ratings, access to the capital markets, and cost of borrowing.

SECTION 4

Business Model and Affordability

4.1 Role of Long-Range Finance Plan

The Long-Range Finance Plan (LRFP) is integral to planning for resource management to address climate adaptation and the reliability gaps identified in the IRP Needs Assessment. The initial Long-Range Finance Plan Needs Assessment (LRFP-NA) is the first phase in the process of providing the Board with information to support its decisions on a finance plan for funding new capital investments through 2045. The initial phase estimates the scale of potential capital investment requirements and overall water rate impacts associated with the four demand and supply scenarios taken from the 2020 IRP-Needs Assessment, which focuses on reliability and resilience to drought.

The ongoing long-range financial planning will consider the projects and programs needed to address all climate hazards. This will continue as the CAMP4W process progresses past the development of the decision-making framework and into the identification of specific proposed capital projects and programs that the Board determines are appropriate to achieve the Time-Bound Targets. Ongoing and iterative financial planning will be integrated with CAMP4W so as to incorporate updated resource needs and inform investment decisions.

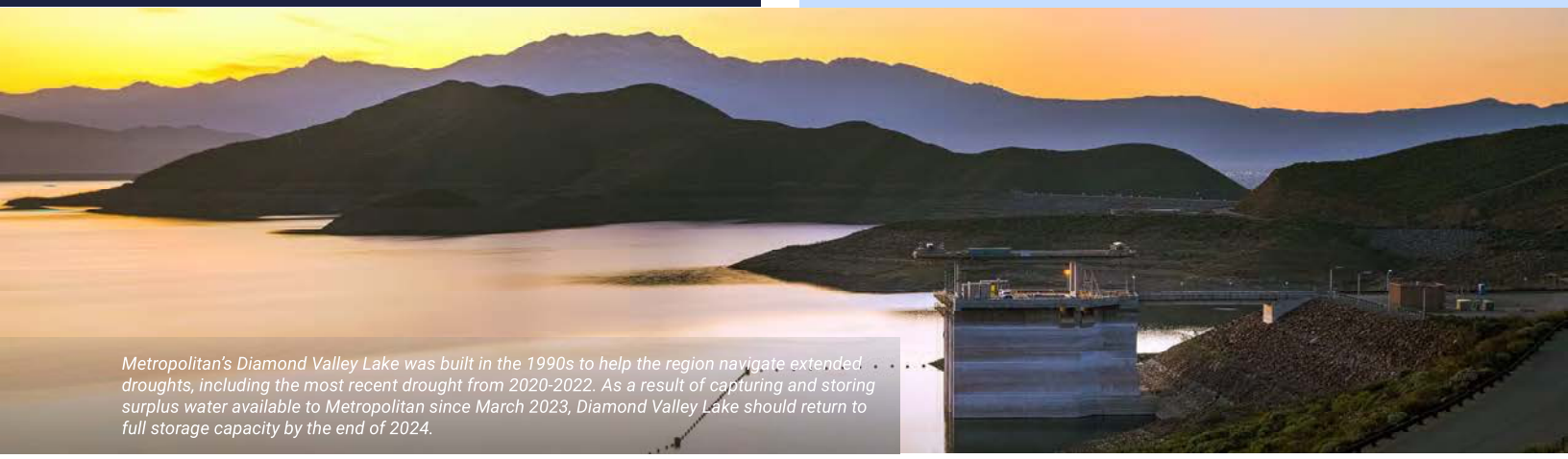
Long-range finance planning will provide a tailored financial analysis to outline funding and financing strategies based on Board input on policy goals and objectives and the outputs from the CAMP4W planning process.

SUMMARY OF LRFP-NEEDS ASSESSMENT:

The LRFP-NA provides high-level guidance on the rate impacts and funding demands Metropolitan must consider for the water resource development needs identified in the IRP. Cost assumptions were developed based on estimated unit cost per acre-foot of either supply or storage as follows:

- **Core supply unit cost:** $3,000/AF (2023$).
- **Storage unit cost:** $300/AF of storage capacity (2023$).
- **Flex supply unit cost:** $600/AF.

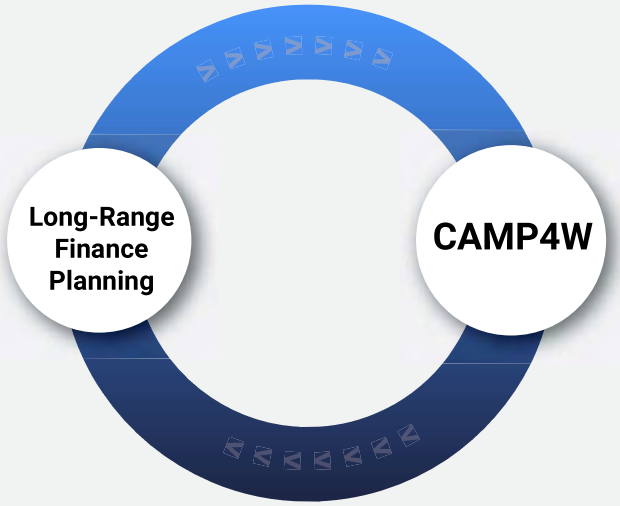
Rate and capital investment values are anticipated to change as the CAMP4W process continues and project- and program-specific costs are evaluated, consistent with an adaptive management approach to planning. Project and program development will further impact the categories of projects or programs needed (supply, storage, conveyance, increased system flexibility, system resilience projects, conservation programs, etc.), which will impact the total estimated costs.



Metropolitan's Diamond Valley Lake was built in the 1990s to help the region navigate extended droughts, including the most recent drought from 2020-2022. As a result of capturing and storing surplus water available to Metropolitan since March 2023, Diamond Valley Lake should return to full storage capacity by the end of 2024.

Future updates to Metropolitan's finance planning process will be accomplished as part of the comprehensive CAMP4W process discussed in Section 6.

Financial planning to support identification of risk tolerance: Resource development decisions come with inherent risks and tradeoffs. One of the key risks facing Metropolitan is that demand conditions could deviate substantially from the capacity created by the selected development portfolio over the near- and long-term. Under the existing rate structure, if demand is lower than forecasted, it could result in higher rates. If demand is higher than forecasted, it could result in water shortages. Any resource development portfolio needs to balance rate increases against risks to reliability. To quantify the impacts of these risks, staff analyzed the rate impacts and net shortages caused by different demand levels on the IRP scenarios A through D. For example, assume that Metropolitan plans and develops resources to meet the demands in IRP D, but that projected demand does not materialize. Instead, assume what occurs is lower demands as projected in IRP A. In this sensitivity analysis, the over-development of core supply and storage to meet the unrealized projected demand in IRP D would result in substantially higher rates. The overall annual rate increase under this framework, based on Metropolitan's current rate structure, increases from 7.1 percent to 10.9 percent over the forecast period through 2032 and from 5.6 percent to 8.1 percent through 2045, assuming development of 250 TAF of storage. The additional costs associated with resilience to hazards beyond drought would further impact these calculations. Conversely, if Metropolitan plans to meet the conditions outlined in IRP A (no new resource development), but experiences the demands of IRP D, Metropolitan could experience shortages of up to 300 TAF from 8 percent to 14 percent of the time through 2032. For the forecast period through 2045, Metropolitan could experience maximum shortages of up to 1.2 MAF from 0 percent to 66 percent of the time. These examples underscore the importance of an adaptive management approach that enables Metropolitan to regularly read the Signposts and make adjustments to minimize risks.



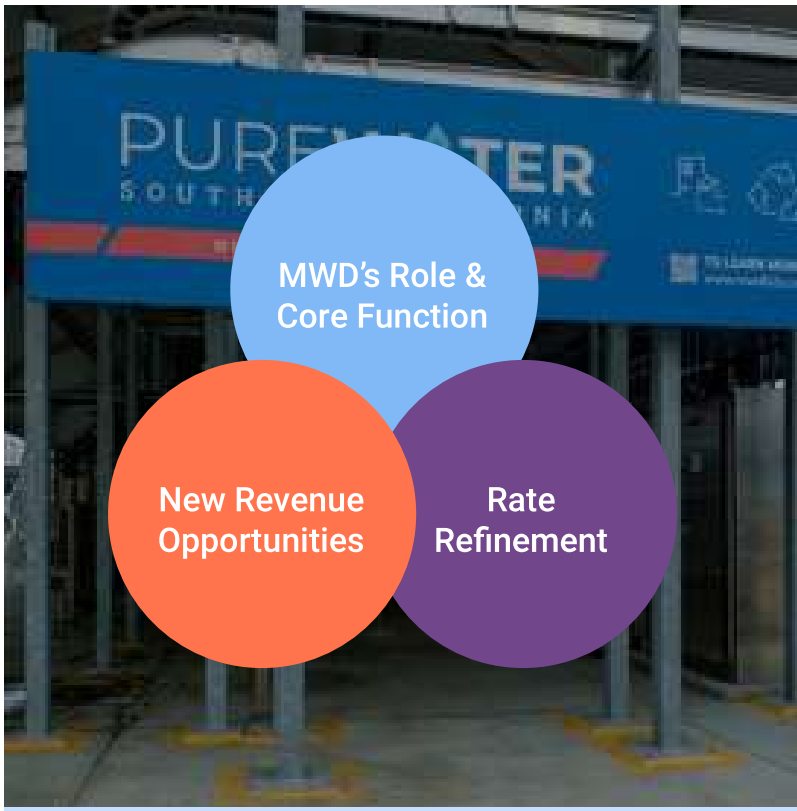
The **iterative process** between the CAMP4W project/program evaluation and long-range finance planning will support the goal of identifying the most cost-effective decisions to meet the region's needs and risk tolerance. A key factor in the decision-making process will be to determine how best to balance risk and cost.

4.2 Business Model

Metropolitan's core business is structured around the sale of treated and untreated water through the importation of water. To conduct this core business, Metropolitan must develop and maintain a network of supportive facilities, which includes conveyance facilities, storage facilities, treatment facilities, and other associated infrastructure. Metropolitan must also undertake additional responsibilities such as regional planning, design, water quality monitoring, maintenance, permitting, and other tasks necessary to provide a reliable supply of treated and untreated water. The Board and Member Agencies have expressed an interest in evolving Metropolitan's role in the region for financial sustainability purposes and to foster further development of local supply and storage options to address the reduced reliability of imported supplies. With the whiplash of alternating severely dry and severely wet weather, water demands and supplies follow a similar fluctuation and can disrupt necessary revenue streams. While the current Business Model has successfully facilitated the delivery of safe and reliable water for decades, adjustments to Metropolitan's business model could improve the ability of Metropolitan to serve the needs of its Member Agencies in the face of a changing climate and the level of investment necessary to prepare Metropolitan for the future. Metropolitan will be discussing the purpose, desired outcome, and components of the Business Model with the Board and Member Agencies in 2024. This is intended to involve reviewing Metropolitan's current Business Model, identifying the problem statement, evaluating the role Metropolitan may take moving forward, and determining how the existing Business Model should be updated and revised to address Metropolitan's problem statement and goals. As a two-directional process, some Business Model decisions may impact other CAMP4W components at the same time as those components may inform the Business Model decisions.

Across the nation utilities are faced with the challenge of evaluating their ability to maintain financial sustainability in the face of an uncertain climate, increased operational and capital costs, aging infrastructure, and expectations of greater equity (such the need to invest disproportionally in areas that historically have experienced under investment). Metropolitan faces similar challenges and has the added challenge of facing the potential for reduced water demands due to climate volatility, conservation and increased local supply.

These challenges support the examination of Metropolitan's existing revenue structure and the consideration of new revenue structures to support Metropolitan's continued role in the region and financial sustainability.



Metropolitan will be exploring multiple components that could be included in the updated Business Model to ensure the Business Model facilitates:

- Addressing equity and fairness concerns in current rates and charges, including the treatment surcharge.
- Capturing the value of Metropolitan's role in conservation, water use efficiency and local water resources development.
- Exchange of water resources and sharing of assets between Member Agencies.
- Expanding local capacity and regional benefits through Metropolitan co-investing in local resource development.
- Providing regional support to Member Agencies to develop affordability strategies for their customers across the region, including but not limited to technical or policy guidance, advocacy for state and federal action or funding, and fiscal capacity to facilitate external grants or other funding.
- Identifying additional revenue streams through increased monetization of assets and properties, grants, and service delivery.
- Exploring mechanisms for expanding financial capacity to make necessary investments and considering the balance between fixed and volumetric rates.

4.3 Addressing Affordability

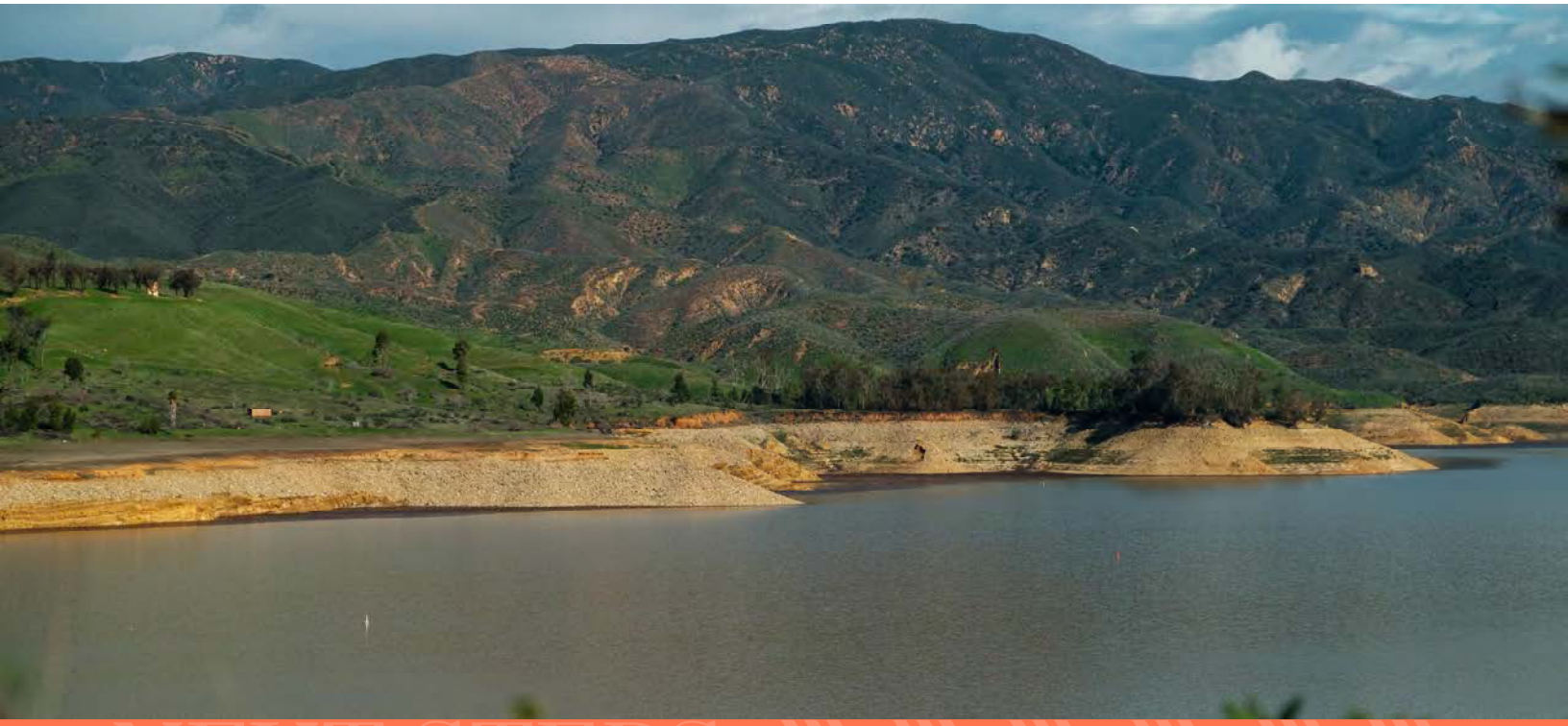
A series of affordability panel discussions were conducted during Equity, Inclusion, and Affordability (EIA) Board Committee meetings in 2023 and early 2024. These affordability discussions are informing the Board's CAMP4W process and expanded on initial CAMP4W thematic statements on affordability and equity, which serve as guideposts in the development of the Climate Decision-Making Framework and evaluative criteria. Each panel was comprised of representatives from different sectors, including but not limited to non-governmental organizations, Member Agencies, utilities, and researchers. Metropolitan's role as a wholesale water provider naturally focuses its affordability strategies on the rates charged to its Member Agencies, not to retail customers. However, Metropolitan efforts to provide tools, direct programs, and support funding mechanisms can directly affect Member Agencies and the customers they serve. Metropolitan and its Member Agencies are also informed by California's Human Right to Water (HR2W) Policy, AB 685 (2012), which states that "…every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes." Although not applicable to Metropolitan or other local agencies, this policy broadly applies to state agencies when revising, adopting, or establishing policies, regulations, or criteria. Currently domestic HR2W minimum indoor water use during curtailment is recognized as 55 gal./person/day (GPCD), reference Cal. Code Regs. Tit. 23, § 878.1.

Based on the affordability panels, Board and Member Agency input and community engagement thus far, staff will pursue options in the following categories during the CAMP4W process in 2024. Additional items can be added based on ongoing discussions and feedback.

- **Statewide and Federal Advocacy:** There was consensus among many panelists for Metropolitan to take an active role in advocating for statewide and federal policies that support water affordability. This includes supporting

legislation for statewide low-income rate assistance programs and seeking federal funding opportunities to offset the costs of essential water infrastructure projects.

- **Collaboration and Information Sharing:** Increased collaboration and information sharing among Member Agencies on successful affordability and conservation programs would allow agencies to learn from each other and adopt best practices suited to their unique circumstances.
- **Leverage Non-Rate Revenues:** Metropolitan could explore utilizing non-rate revenues to fund affordability programs. This approach could involve leveraging assets, partnerships, and grants to support low-income communities and conservation programs targeting disadvantaged communities. As an example, SFPUC uses approximately $12 Million in annual real property lease revenue to fund its low-income assistance program.
- **Investment in Education and Outreach:** Discussions stressed the need for Metropolitan to invest in educational initiatives to ensure that affordability programs reach and are utilized by those most in need. This could involve targeted outreach efforts and partnerships with community organizations to raise awareness about available assistance programs.
- **Policy and Program Innovation:** Metropolitan was encouraged to continue exploring innovative policies and programs that address both system-level and household-level affordability challenges. This might involve working with Member Agencies on exploring new billing structures, subsidies for low-income households, and programs that reduce the water bill impact on vulnerable populations.
- **Needs Assessment and Metrics:** Methodologies to identify, assess and address any inequities in benefits and services provided helps Metropolitan appropriately target its resources and programs. The team will also explore Time-Bound Targets focused on benefiting underserved communities, ensuring meaningful community engagement as well as options for advancing greater affordability for Board consideration through the CAMP4W process.



NEXT STEPS

- **Develop mutual understanding of current business model and objectives for refinement**
- **Establish the schedule for ongoing integration with the 10-year financial forecast**
- **Incorporate risk analysis into the Board's investment decision-making**
- **Consider business model alternatives**
- **Identify how Metropolitan can pursue options that advance affordability and equity goals**

SECTION 5

Policies and Initiatives

5.1 Policies and Initiatives

Policies will provide direction in how Metropolitan will achieve resource development goals, establish new or maintain existing initiatives, where initiatives include specific programs, issues for further study or research, or other activities identified by the Board to pursue CAMP4W goals. Some areas where Metropolitan has or will be focusing policy efforts are expressed in the Policy-Based Time-Bound Targets (Section 2). Additional polices and initiatives will also be developed in this process. Areas of development for 2024 are included below.

SHAPING OUR FUTURE

Policies that focus on being equitable, forward-thinking, and environmentally sustainable can shape the direction Metropolitan takes into the future, impacting investment decisions and the footprint we leave behind.

EQUITABLE SUPPLY RELIABILITY

While Metropolitan's Resource-Development targets identify the supply and storage needs for long-term reliability, the decision to specifically focus on areas experiencing inequity is driven by policy-based targets. Metropolitan's policy goals can further identify the types of measures it will prioritize towards meeting these goals.

LOCAL AGENCY SUPPLY DEVELOPMENT

The IRP Needs Assessment assumes a certain amount of local supply will remain available overtime. By developing policies that focus on supporting Member Agencies in their efforts to protect, preserve, and share those supplies, Metropolitan will define its preference towards continuing to support local supply reliability as a key resource.

CONSERVATION AND EFFICIENCY

Metropolitan embraces Making Conservation a California Way of Life, by considering policies and programs that capture the true value of water efficiency and conservation to achieve our goals of long-term reliability, resilience and financial sustainability. This includes policies to support Member Agency compliance with SWRCB standards.

RESILIENT INFRASTRUCTURE

Assessing climate risks and expanding Metropolitan's current robust process of asset protection is critical. As our climate and risks shift, policies that direct Metropolitan to identify and address risks based on future conditions will help guide investment decisions.

SUSTAINABILITY

As an environmental steward, current and new Metropolitan policies can contribute to long-term environmental sustainability including reducing our greenhouse gas emissions, increasing energy and water efficiency, pursuing renewable energy and reducing waste.

SURPLUS WATER MANAGEMENT

Policies can support Metropolitan's management of surplus water such as during flooding events or when excess recycled water is available, by developing additional storage within existing basins and reservoirs and through new opportunities.

ECOSYSTEM AND HABITAT BENEFITS

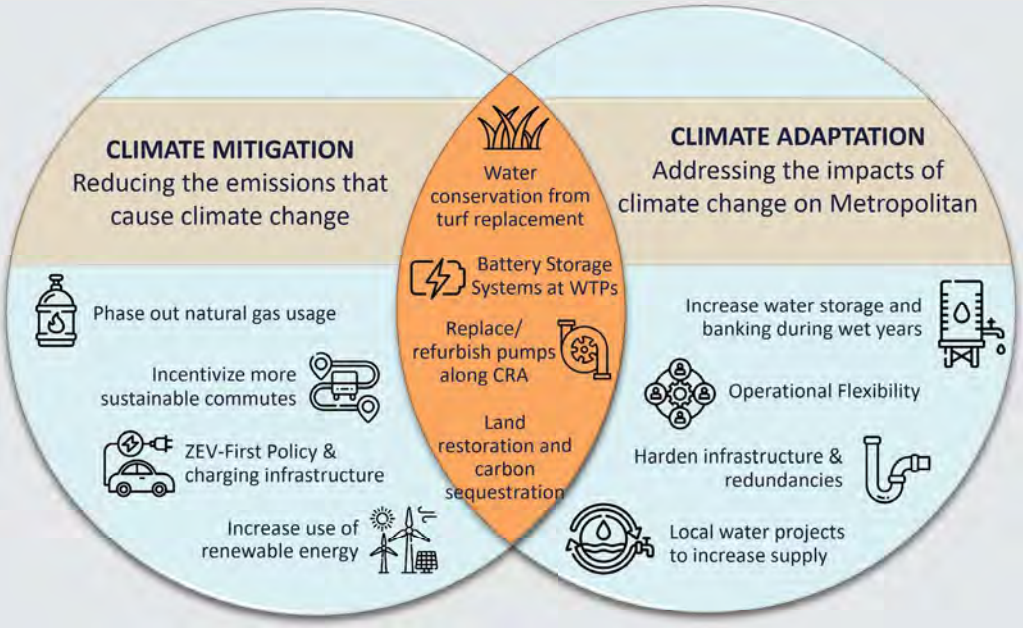
Healthy ecosystems can impact water quality, water supply, and infrastructure resilience. Policies can drive investment to make the ecosystem more resilient to fires, flooding and other risks, protect the water quality coming from the watershed, influence supply reliability, and protect infrastructure from risk of loss or damages.

COMMUNITY EQUITY AND AFFORDABILITY

Metropolitan is committed to diversity, equity, and inclusion, through policies such as mitigating impacts to disadvantaged communities or engaging underrepresented communities in workforce development, and those that consider affordability and Metropolitan's role as a wholesaler.

WORKFORCE DEVELOPMENT

Preparing for a future with increased climate extremes drives the need for critical policies surrounding workforce development goals and Metropolitan's process for protecting employees operating under extreme or otherwise risky conditions.



5.2 Partnership Opportunities

Throughout the CAMP4W process, the Board and Member Agencies have expressed a shared commitment to working collaboratively to prepare for a changing climate. Discussions have emphasized the importance of partnerships and collaboration among Metropolitan and Member Agencies as we work towards identifying adaptive solutions that meet our Resource- and Policy-Based Targets and provide regional benefits.

Collaboration with external partners, both within and outside of Metropolitan's service area such as those who rely on the same sources of our imported water, is also critical in achieving Metropolitan's goals. As shown in Figure 5-2, Metropolitan's assets and supplies cross multiple regions. Considering how to expand integrated planning and collaboration through "out of the box" thinking could result in broader benefits, such as increased reliability and cost savings.

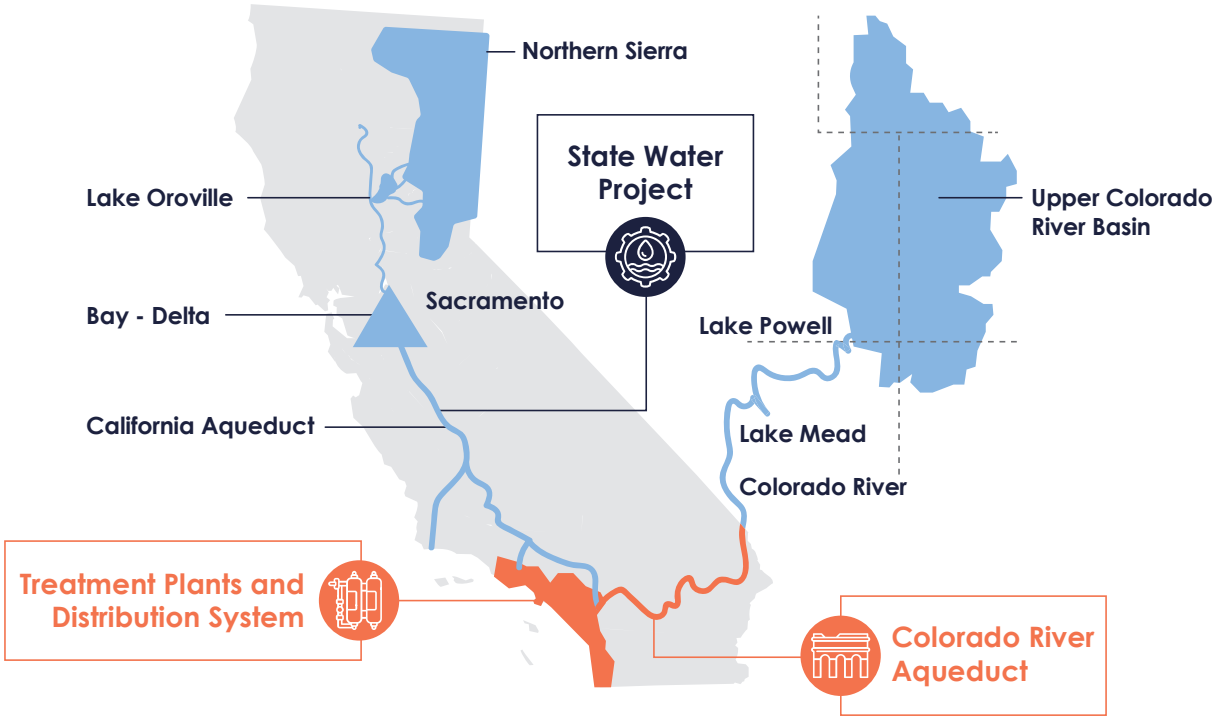


Figure 5-2. Imported Water Supplies

5.2.1 Metropolitan and Member Agency Partnerships Opportunities

Metropolitan has long partnered with Member Agencies on projects and programs through its Local Resources Program (LRP). This program facilitates Metropolitan contributing funds to Member Agency projects that increase local water supplies and reduces the region's dependence on imported water, thereby reducing Metropolitan's resource development needs.

As Metropolitan contemplates the most effective and efficient use of its financial resources, exploring additional opportunities to maximize the use of existing assets within the region is a critical piece of the evaluation process. This could include water supply elements, such as exploring additional storage opportunities within the groundwater basins or evaluation of excess supply options, as well as resilience opportunities or opportunities to support conservation and other programs. CAMP4W will facilitate discussions among Metropolitan and Member Agencies to understand the extent to which collaboration should be planned for and what Metropolitan's role will be.

Additionally, through the CAMP4W process, Metropolitan will establish how Metropolitan can facilitate similar partnerships between Member Agencies. This could include facilitating discussions on opportunities to convey water from an agency with excess supply but limited storage to an agency with excess storage but limited supply availability, or by facilitating how this type of exchange would work financially and operationally.

CAMP4W will establish the extent to which Metropolitan and Member Agencies intend to work collaboratively towards shared goals by maximizing the assets we already have, and being strategic in how we identify new reliability and resilience projects.

5.2.2 Additional External Partnership and Collaboration Opportunities

Shared goals and challenges present opportunities for Metropolitan to continue to explore partnerships with other water suppliers, State and Federal agencies, business and agricultural interests, community-based and environmental organizations, and many other entities. Metropolitan is actively working with business and agricultural entities on projects and research on new approaches that improve water efficiency and offer other benefits for carbon capture and sequestration. Metropolitan is also building relationships with community-based and environmental organizations to support their efforts to build capacity to undertake larger projects and programs in collaboration with public agencies. Beyond the value of understanding the needs and interests of other communities and industries, these efforts better leverage grant funding for the region as it becomes available through state and federal programs.

Metropolitan's interests extend far beyond the boundaries of its service area. As a wholesaler of imported water, it relies on supplies that are also critical to other agencies and communities in California and the West. Metropolitan has long partnered with water districts, community organizations and agencies within the Bay-Delta watershed and within the Colorado River Basin. As each of these regions face similar climate vulnerabilities and challenges, opportunities to co-invest, maximize local resources, and diversify water supplies will grow in importance.

In upcoming conversations on the Business Model and specific project and program investments, new and expanded partnership models will be considered to:

1. Enhance opportunities to maximize co-benefits
2. Improve returns on investment and financial outcomes
3. Increase efficiencies
4. Build relationships and trust

LOS ANGELES COUNTY SANITATION DISTRICTS

Metropolitan is partnering with LACSD on Pure Water Southern California, a proposed water reuse program that would redirect treated wastewater into an advanced water treatment facility to produce up to150 million gallons per day of purified water. If approved, this program would reduce discharges to the ocean, increase local water supply, reduce pressure on imported sources of water, leverage district resources and assets, and allow the two agencies to share the costs.

AGRICULTURAL PARTNERS IN PALO VERDE VALLEY

Metropolitan continues to work with farmers along the Colorado River to conserve water and invest in water efficiency and soil health measures. This partnership results in water savings, local economic benefit, soil health and increased potential to store atmospheric carbon.

5.3 Community Engagement

Public engagement in the CAMP4W process is essential to public support and acceptance for implementation, and importantly public trust. It is the means to ensure transparency and provide opportunities for diverse voices to raise their priorities, concerns, and ideas with Metropolitan and the Member Agencies. In the first year, Metropolitan focused on developing communication tools and engagement strategies in collaboration with Member Agencies. CAMP4W has a prominent presence on Metropolitan's website (mwdh2o.com/camp4w) with information and a library of resources. A video was created along with an information sheet to communicate the purpose and key ideas. Four listening sessions were held with environmental and community-based organizations to seek their input on themes, evaluative criteria, community equity and more. Metropolitan has presented CAMP4W in numerous public meetings, including to the boards of several Member Agencies as part of presentations by the Chair of the Board and the General Manager. Community engagement activities will increase over the coming months to ensure the Task Force has the benefit of community input in preparing the full plan for Board consideration. In collaboration with the Member Agencies, planned activities include workshops, listening sessions, forums, presentations, tabling at community events and work with community-based and tribal organizations.

NEXT STEPS

- **Develop and consider policies and initiatives**
- **Explore Metropolitan and Member Agency partnership opportunities**
- **Pursue external partnership and collaboration opportunities**
- **Continue community engagement**

SECTION 6

Adaptive Management

6.1 Adaptive Management Approach

Through the CAMP4W process, the Board and Member Agencies have identified the adaptive management approach to be the path forward as Metropolitan embarks on its journey into this era of planning under deep uncertainty. Adaptive management will allow Metropolitan to continuously re-evaluate real-world conditions to adjust investment decisions based on the best available information at the time a decision needs to be made. It will allow Metropolitan to make decisions and course correct if conditions change or alternatives become available.

Phased decision-making is not new to Metropolitan. Significant projects have been assessed by the Board incrementally, allowing the Board to weigh the project or program's benefits and costs at natural intervals. The adaptive management framework embraces this established process and adds specific metrics to track real-world conditions. This allows CAMP4W evaluations and inputs to be adjusted when needed. Figure 6-1 presents the Adaptive Management Process.

Incremental decisions based on real-world conditions will allow the Board to avoid, to the maximum extent possible, over or under investing. Committing to advance early phases of a project or program in the short term does not force Metropolitan to commit to funding that project over the long term if conditions or information changes. **The Board will ultimately have the flexibility to change course, when needed, through the Adaptive Management process.**

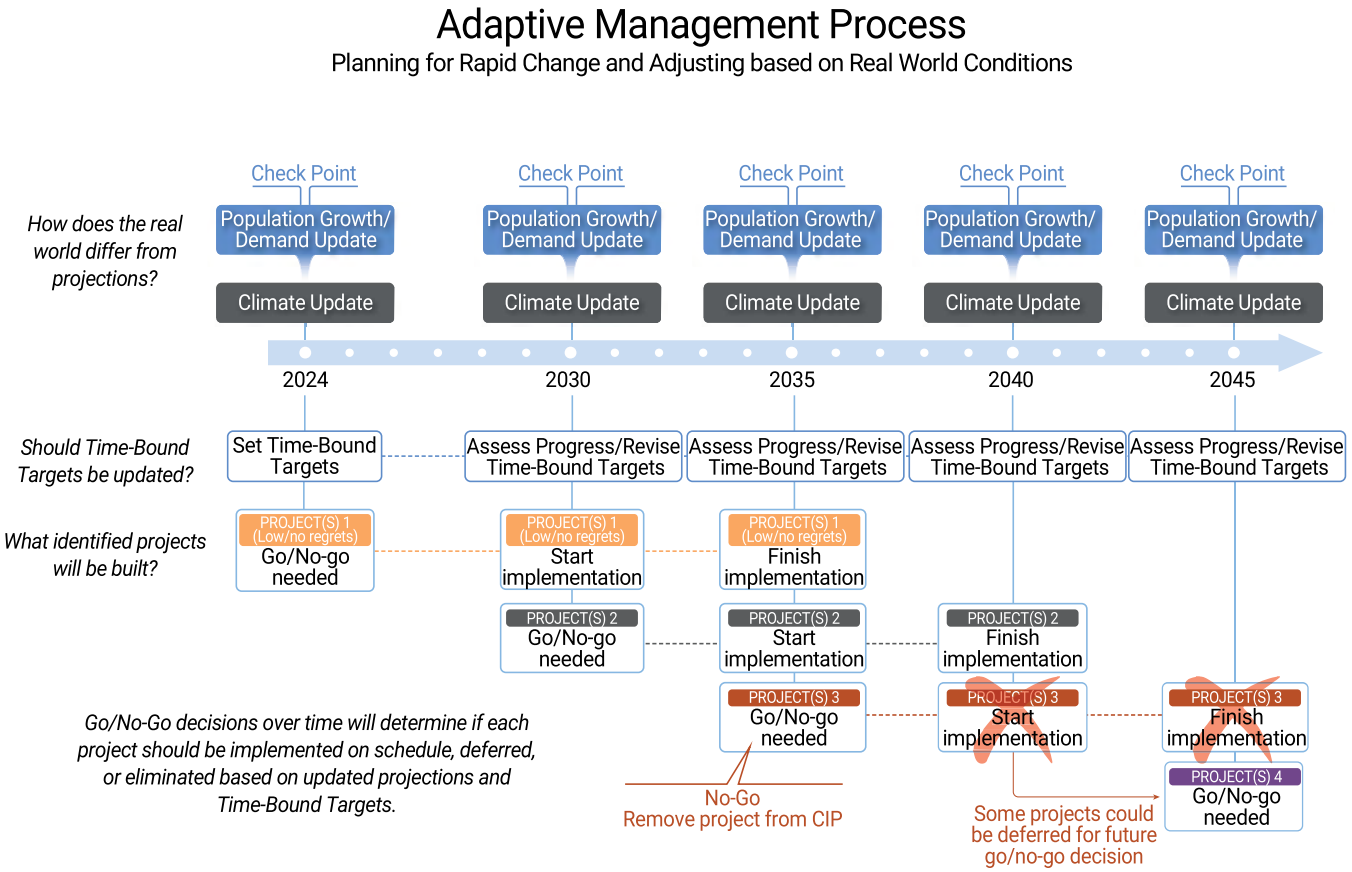


Figure 6-1 Adaptive Management Process

6.2 Signposts and Monitoring

A key part of the Adaptive Management Process involves reading Signposts to understand the real-world conditions and determine if the Time-Bound Targets need to be revised, which would in turn impact investment decisions. The Signposts must be based on metrics that are measurable and readily available so that Metropolitan staff can provide valuable updates to the Board.

Throughout 2024, the Task Force will work towards developing specific metrics under each of the categories shown in Figure 6-2. These metrics will be reviewed annually and presented to the Board as part of the CAMP4W Annual Report, as discussed further in the following section. The regularly updated Signpost data will be a critical factor in the Adaptive Management process and will facilitate the Board's ability to make informed, incremental decisions based on up-to-date information. With the CAMP4W process designed to align with Metropolitan's current CIP program, the Board will be positioned to change course as needed over time.

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		Connectivity and Robustness	
		Infrastructure Capability	

Figure 6-2 Proposed Signpost Metrics

6.3 CAMP4W Reporting and Updates

Adaptive management requires monitoring of conditions over time and revisiting past decisions on a regular basis. The CAMP4W planning process has been designed to follow a five-year cadence to ensure the Board has the information necessary to advance projects. This process will be done in three phases:

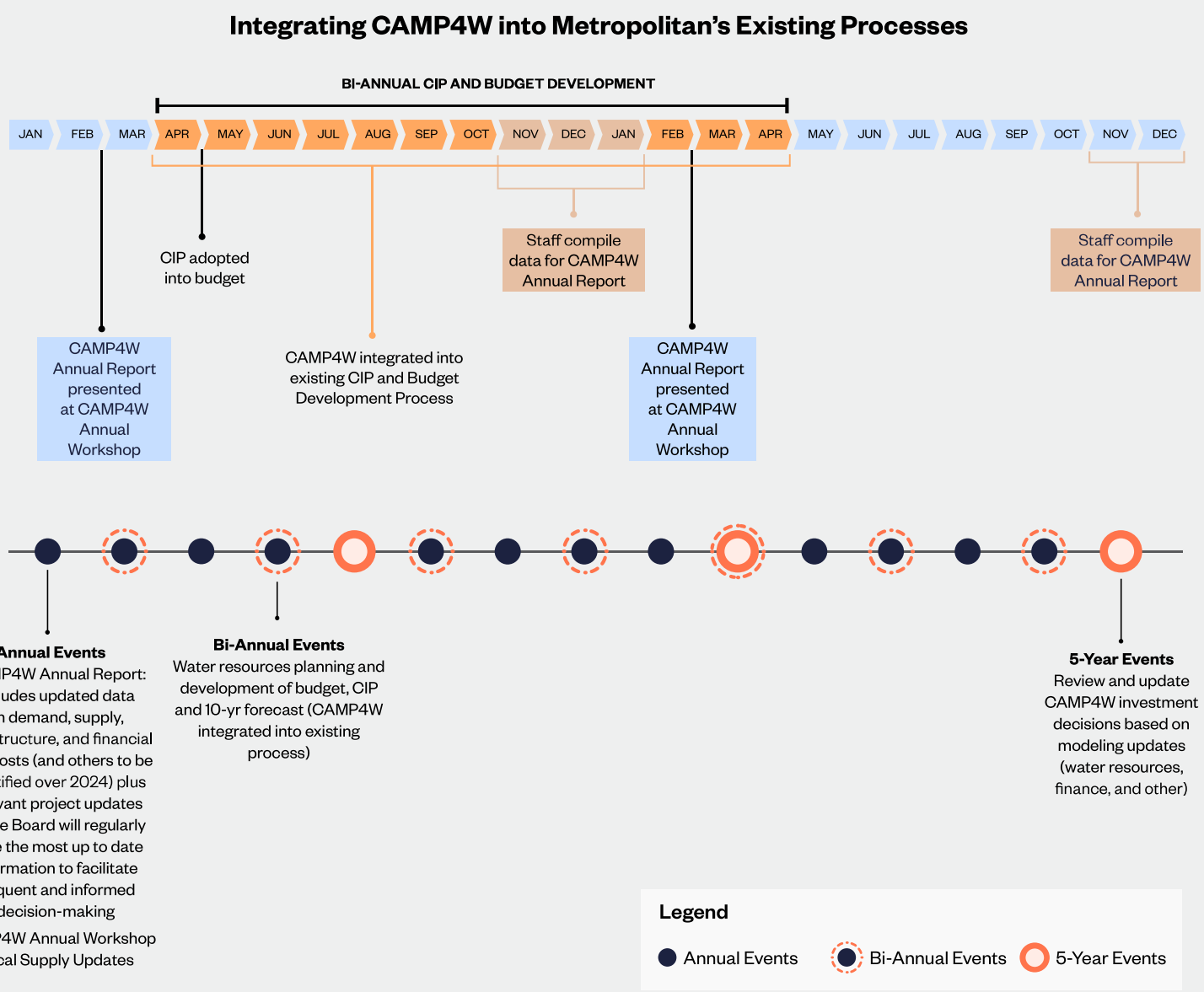
Annually. Metropolitan staff will prepare a CAMP4W Annual Report and hold a CAMP4W Annual Workshop to provide the Board with the tools it needs to understand the impacts of past decisions and to make informed decisions going forward. The first update will be prepared by the end of 2024. The annual report will include:

- **Reading of the Signposts:** Metropolitan will prepare a summary report that lists each signpost and provides an update on data, trends, or a timeframe when an update would be available, depending on the Signpost (e.g., population trends can be provided annually, but global climate projections will not be updated at that same frequency).
- **Recommended updates to the Time-Bound Targets:** Based on findings from the reading of the Signposts, Metropolitan will revisit the Time-Bound Targets if the new information suggests that developing towards the then-current Time-Bound Targets will result in over- or under-developing.
- **Project updates as needed:** Metropolitan will include a brief update on projects or programs included in the previous CIP as well as updates on any projects or programs.

Bi-annually. CAMP4W projects and programs will be evaluated for inclusion in the bi-annual CIP and budget. Project and program evaluation will follow the evaluation process discussed in Section 3. This will be informed by the Annual Report, Signposts, and Time-Bound Targets as well as the CIP and budget process.

Every Five Years. As time goes by and conditions change, more extensive planning and evaluation will be needed. This five year update will include a comprehensive CAMP4W update, inclusive of water resources and finance updates.

Figure 6-3 CAMP4W Deliverable Timeframe

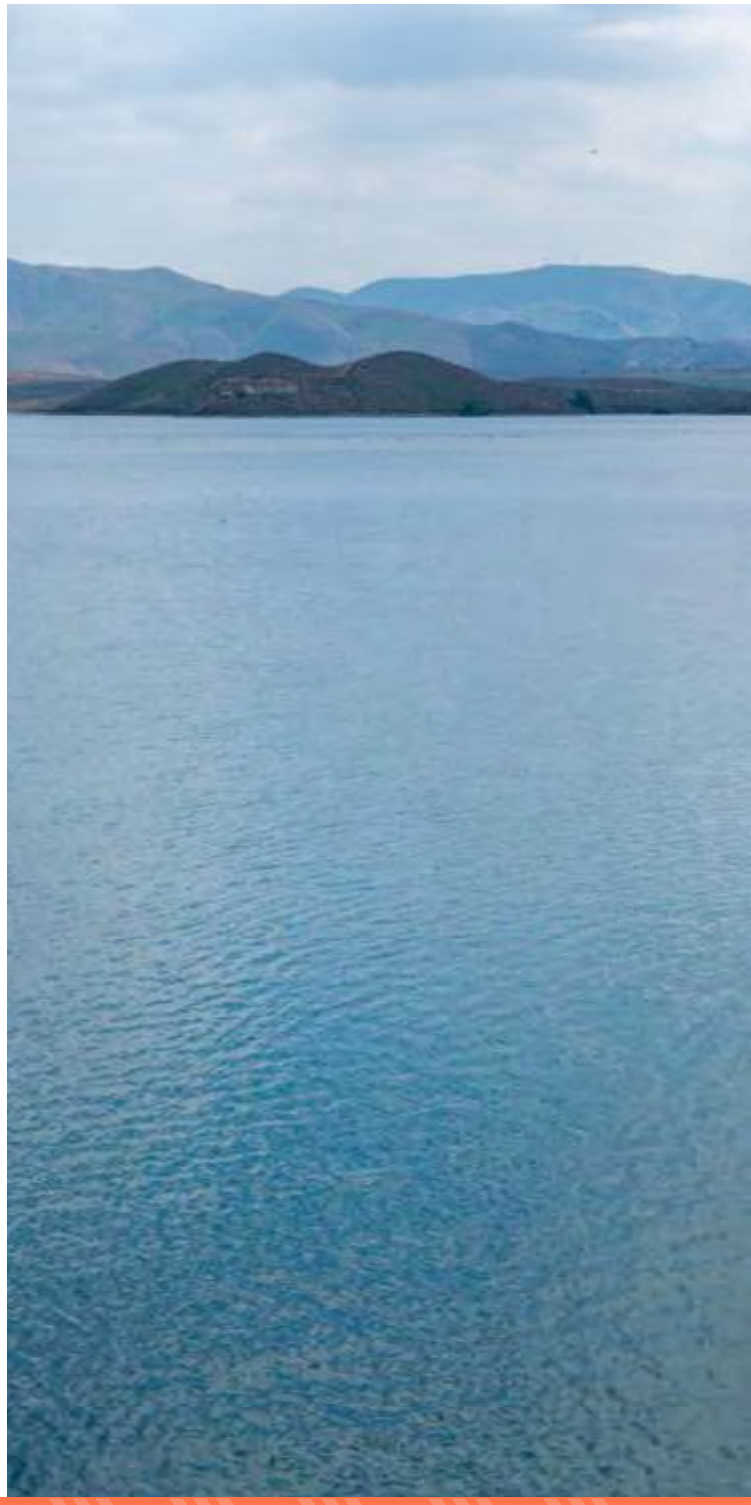


6.4 Identification of Go Projects and Programs

As discussed in Section 3, the CAMP4W projects and programs to include in the CIP and budget will be developed based on a robust evaluation at the project and program level. These projects and programs will be evaluated for funding of a given phase (planning, design, implementation, O&M), and through the Adaptive Management process, Metropolitan will have the opportunity to continue to fund subsequent phases, put a project or program on hold until further information is made available, or to remove a project from the CIP. This will provide the Board with control over the catalogue of investment decisions made over time, while allowing progress to continue to progress annually.

As the initial CAMP4W plan is developed over 2024, a series of "Go" projects and programs will be identified. Early advancement of these projects and programs would occur prior to the completion of the CAMP4W process. These projects and programs will represent the first subset of projects and programs identified to meet critical Time-Bound Targets and will consist of projects and programs already being evaluated by the Board, including the State Water Project Dependent Areas Go Projects listed below. Use of Evaluative Criteria will support alignment with Board priorities and early advancement will allow the Board to make immediate progress toward goals.

As will be further defined over 2024, Metropolitan's evaluation of future projects will take into consideration any updates to the Time-Bound Targets that may arise as the modeling assumptions are refined to reflect the most up-to-date data available, which may result in revisions to the Time-Bound Targets.



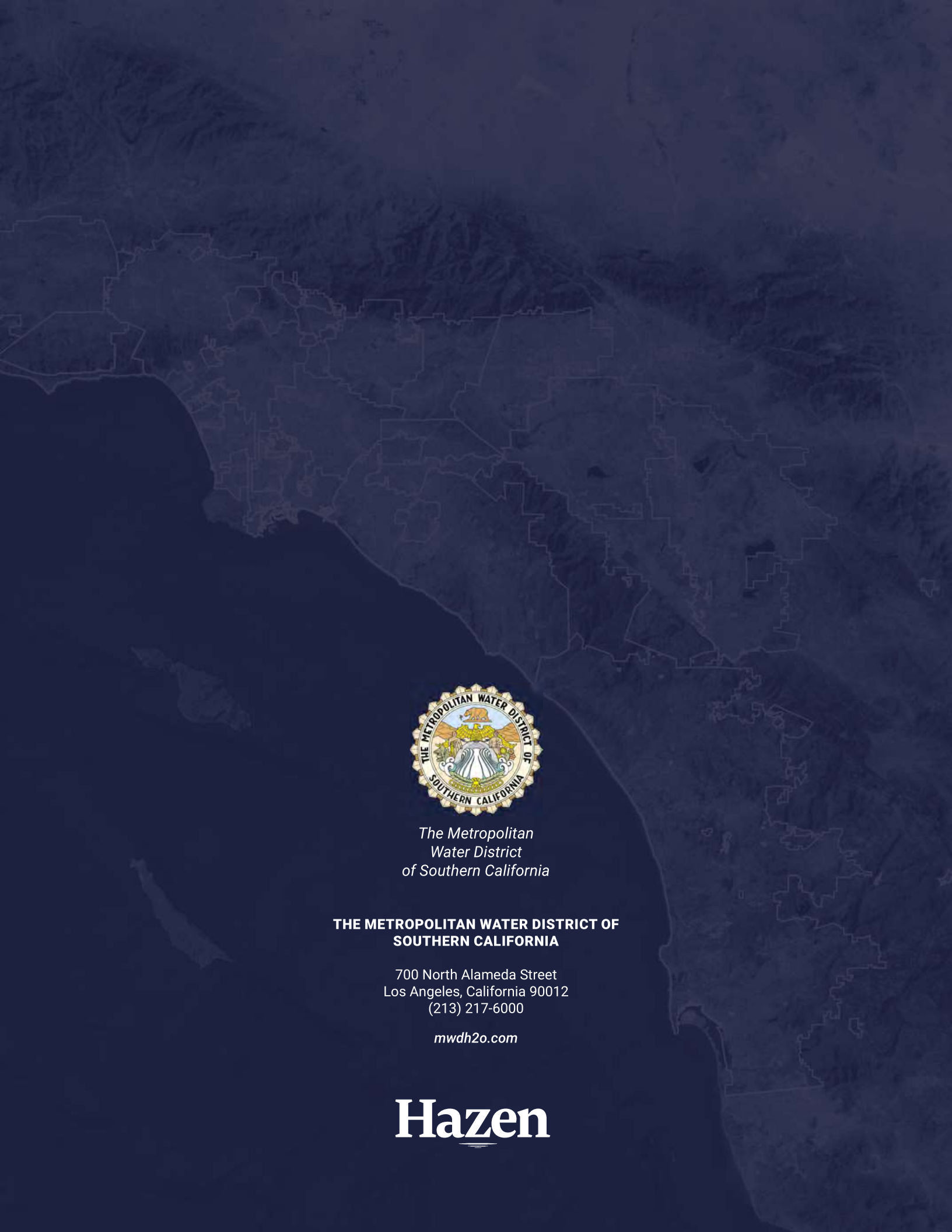
State Water Project Dependent Areas Go Projects

Project Type	Project Title	Project Phase
System Flexibility Improvements: DVL Storage to Rialto Pipeline Delivery	Wadsworth Bypass Line	In Construction
	Inland Feeder/Rialto Pipeline Intertie	In Construction
	Inland Feeder Badlands Tunnel Surge Protection Facility	In Construction
	Sepulveda Feeder Pumping Stage 1	In Construction
System Flexibility Improvements: Operational Shift	Sepulveda Feeder Pumping Stage 1	In Construction
	Burbank Service Connection B-5 to B-5A Shift	In Planning/ Design
	TVMWD Miramar Pumpback Upgrade	In Planning/ Design

NEXT STEPS

- Refine Adaptive Management and how to institutionalize it into Metropolitan's processes
- Further develop Signposts and specific metrics
- Develop CAMP4W Annual Report Template
- Refine process for integrating CAMP4W projects into CIP and budget
- Identify early "Go Projects" and program opportunities
- Continue development of dashboard and digital support tools

Rainbow visible during Oroville Spillway Release, March 2024
(photo courtesy of the Department of Water Resources)



The Metropolitan
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of Southern California

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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