THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Action

- **Board of Directors**
  Finance and Asset Management Committee

4/8/2025 Board Meeting

7-6

Subject

Approve Climate Adaptation Master Plan for Water Five-Year Implementation Strategy; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

In February 2023, the Board directed staff to integrate water resources, climate considerations, and financial planning into a Climate Adaptation Master Plan for Water (CAMP4W). In October 2023, the Board chartered a Joint Task Force of Board Members and Member Agency Managers to facilitate the development of CAMP4W in a timely and transparent process. Rooted in adaptability, Metropolitan's CAMP4W, through its implementation, will facilitate Metropolitan's continued reliability and resilience in the face of change and uncertainty while responding to real-world conditions, course correcting as needed, and achieving its core mission to provide safe, reliable water to its member agencies.

CAMP4W comprises multiple components which together form a living master planning program. This item presents the CAMP4W Five-Year Implementation Strategy, which both culminates the initial planning phase and sets forth a critical path towards implementing and institutionalizing climate adaptation at Metropolitan over the next five years. The components of the CAMP4W Implementation Strategy include the Background and Purpose, Assessed Vulnerabilities and Needs, Time-Bound Targets, Policy Framework, Climate Decision-Making Framework, and a set of Implementation Timelines. The timelines include projected board decision points for water, energy, and infrastructure projects and programs to comprehensively prepare the Board and member agencies for anticipated CAMP4W assessments and decisions. These timelines are iterative and subject to change based on evolving information and adaptation needs, and progress will be reported annually in the CAMP4W Annual Reports. The recommended action is limited to approving the above-described process. Recommendations for action on specific investments will be brought to the Board separately, when and as appropriate.

Proposed Action/Recommendations and Options

Staff Recommendation: Option #1

Option #1

Approve Climate Adaptation Master Plan for Water Five-Year Implementation Strategy

Fiscal Impact: None
Business Analysis: The Implementation Strategy will inform decision-making and future investments to meet Metropolitan's needs in a climate-impacted future.

Option #2

Do not approve.
Fiscal Impact: None
Business Analysis: Metropolitan staff would not have board direction to implement the policy guidance, decision-making tools, and next steps included in the CAMP4W Implementation Strategy.

Alternatives Considered

Not applicable

Applicable Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

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

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

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

By Minute Item 53630, dated May 14, 2024, the Board concurred with the CAMP4W: Draft Year One Progress Report and Next Steps, with the understanding that staff would provide the Board updated data and other information before consideration and approval of any CAMP4W projects.

Related Board Action/Future Action

Not applicable

Summary of Outreach Completed

Staff continues to engage member agencies, their boards and councils, as well as the public in the CAMP4W process. Engagement opportunities to date included listening sessions with environmental and community-based organizations as well as agricultural and business partners. Metropolitan held a public forum and has shared information on CAMP4W at various events throughout its service area.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is not defined as a project under CEQA because it involves organizational maintenance, or administrative activities; personnel-related actions; and/or general policy and procedure making that will not result in direct or indirect physical changes in the environment. (Public Resources Code Section 21065; State CEQA Guidelines Section 15378(b)(2) and (5)).

CEQA determination for Option #2:

None required

Details and Background

Background

To ensure the continued reliability of water supplies for our member agencies and their customers, Metropolitan embarked on the development of a Climate Adaptation Master Plan for Water (CAMP4W), a comprehensive set of policy directives and decision-making tools to ensure the Board of Directors is equipped to consider climate risks to water supplies, water quality, infrastructure, operations, workforce, public health, and financial sustainability in its deliberations and investment decisions. CAMP4W provides a roadmap to guide future investments and decision-making as we confront our new climate reality in the years and decades ahead.

CAMP4W comprises multiple components which together form a living master planning program. This item presents staff's recommendation for the CAMP4W Five-Year Implementation Strategy, which both culminates the initial planning phase and sets forth a critical path towards implementing and institutionalizing climate adaptation at Metropolitan over the next five years.

Approval of the Implementation Strategy would direct staff to analyze planned programs and projects based on specific criteria that ensure consideration of climate change impacts and climate vulnerabilities throughout Metropolitan activities and to systematically institutionalize climate adaptation practices and policies to:

1) Institute the consideration of climate change impacts and climate vulnerabilities throughout Metropolitan activities.
2) Enhance resource planning with the integration of climate and financial information.
3) Increase the frequency of updates to resource needs and the factors that drive them.
4) Set targets to guide the development of potential projects and programs to increase climate resilience and ensure continued reliability.
5) Strengthen decision-making on project and program investments through greater transparency and more holistic and uniform analyses.
6) Establish an adaptive management approach to better manage uncertainty and remain responsive to evolving conditions.

The CAMP4W components are depicted in Figure 1. Foundational inputs to the planning process and implementation decisions (on the left-hand side of the figure) include the Integrated Water Resources Plan Regional Needs Assessment, Climate Risk and Vulnerability Assessments, ongoing Infrastructure Studies and Assessments, as well as regular public and partner engagement. The components of the Implementation Strategy include the Time-Bound Targets and Policy Framework as the drivers, the Climate Decision-Making Framework for assessing projects and programs, an adaptive management approach to monitoring, reporting, and adjusting, as well as the Implementation Timelines, which will lay out key milestones over the next five years. The business model is currently under review in a parallel process, and any final decisions from that process will be integrated into CAMP4W assumptions and analyses when appropriate. Although these tools and foundational elements will be deployed over the long term, staff will update the Implementation Strategy more frequently to account for new information and the uncertainty associated with climate change.

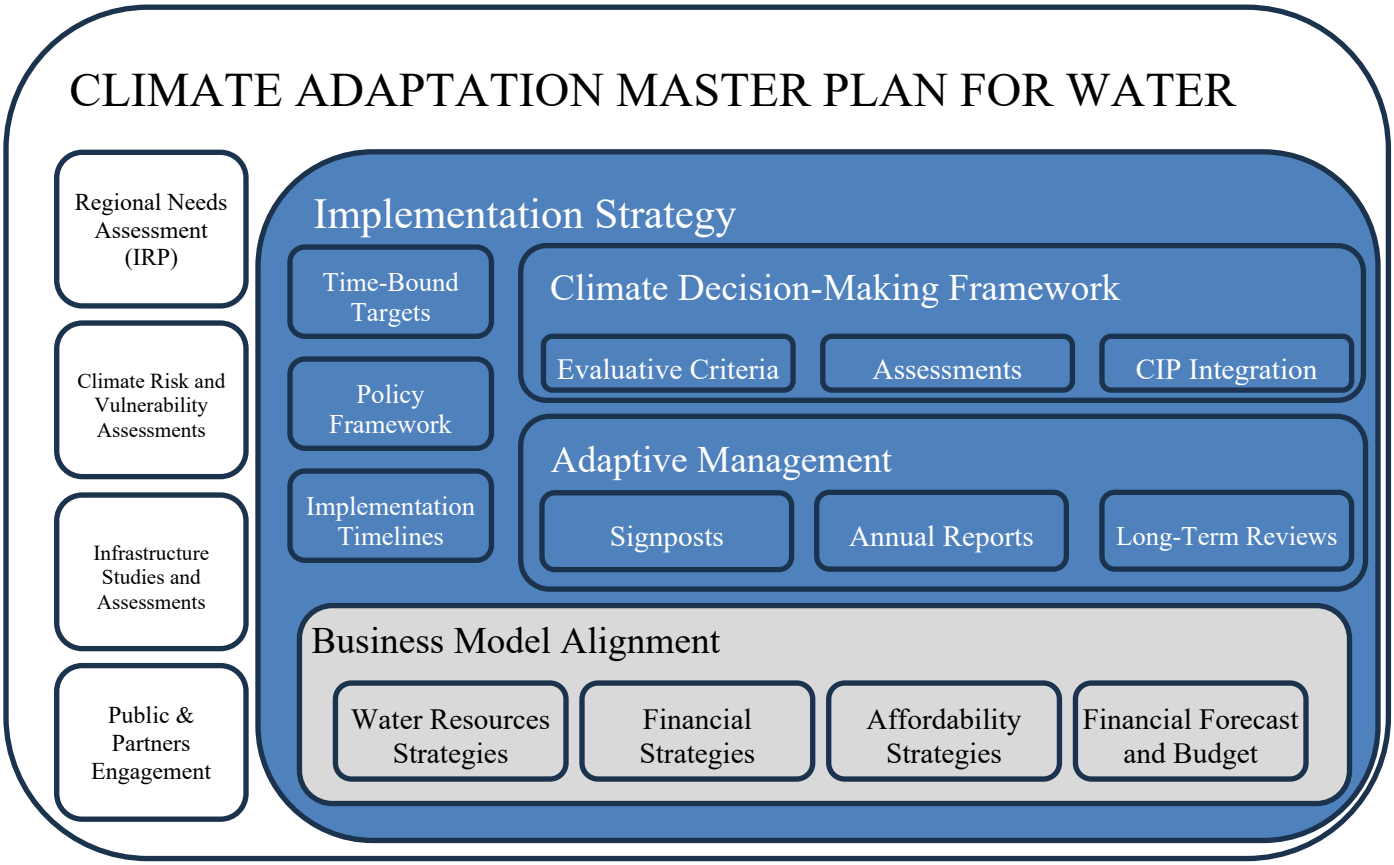


Figure 1: Climate Adaptation Master Plan for Water Components

The components of the CAMP4W Implementation Strategy (**Attachment 1**) include the Background and Purpose, Assessed Vulnerabilities and Needs, Time-Bound Targets, Policy Framework, Climate Decision-Making Framework and a set of Implementation Timelines, which include projected board decision points for water, energy, and infrastructure projects and programs to comprehensively prepare the Board and member agencies for anticipated CAMP4W assessments and decisions. These timelines are iterative and subject to change based on evolving information and adaptation needs, and progress will be reported annually in the CAMP4W Annual Reports. This action is limited to approving the components of the Implementation Strategy, including the Policy Framework and Climate Decision-Making Framework. Specific projects and other investments will be brought to the Board separately, when and as appropriate.

Staff revised the Implementation Strategy based on input received from the CAMP4W Task Force, board leadership and member agencies over the last several months. Specifically, a Water Quality Resilience section was added to the Risks and Vulnerabilities section as were several potential initiatives and climate-induced challenges related to water quality. The Implementation Timelines provide anticipated CAMP4W Assessments for at least four major projects in 2025, including Pure Water Southern California, Sites Reservoir, Delta Conveyance Project and Metropolitan's Water Efficiency Program. The timelines also lay out ongoing

studies and planning processes to identify new and emerging climate adaptation strategies, including efforts related to water resources, infrastructure, power supply, conservation and the business model review. Following board approval of this recommended action, staff intends to use these timelines to guide next steps and will immediately initiate CAMP4W Assessments for a suite of projects/programs, including those listed above, and will prepare for subsequent board review and consideration of the assessments.

4/2/2025

Elizabeth Crosson *Date*
Chief Sustainability, Resilience and Innovation Officer

4/2/2025

Deven N. Upadhyay *Date*
General Manager

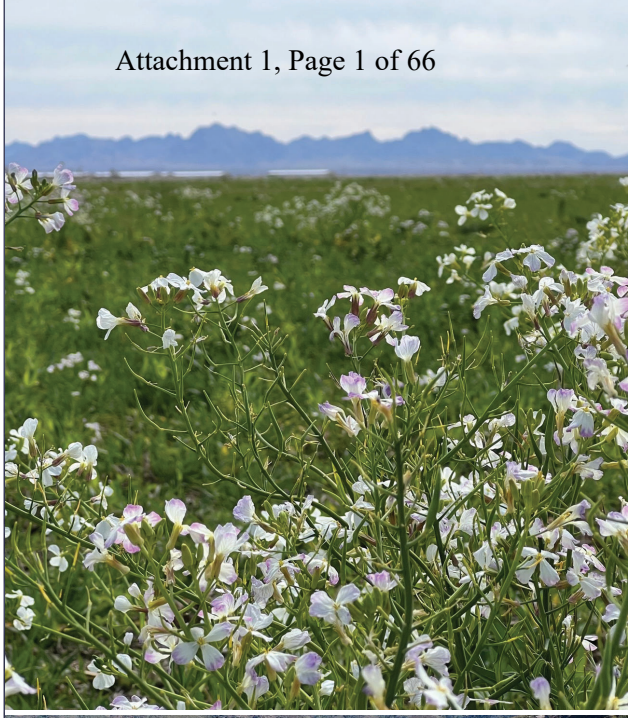
Attachment 1 – Climate Adaptation Master Plan for Water Implementation Strategy

Ref# sri12707391

CAMP4W

Climate Adaptation Master Plan for Water

Implementation Strategy



The Metropolitan Water District of Southern California

APRIL 2025

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A Special Note from the Board Chair

Dear Reader:

On behalf of the Board of Directors of the Metropolitan Water District of Southern California, I am proud to present our Five-Year Implementation Strategy aimed at advancing Metropolitan's climate adaptation efforts. This marks an important milestone in our journey to ensure a sustainable water future for Southern California.

Over the past two years, the Board has undertaken a robust, challenging, and collaborative process with our member agencies to reaffirm our core mission: delivering reliable and high-quality water in the face of the escalating resource, infrastructure, and financial challenges wrought by increasing climate volatility. The Climate Adaptation Master Plan for Water (CAMP4W) is not your typical master plan. Rather than being confined to static binders, it is defined by iterative, adaptive, and innovative decision-making tools and policy directives that institutionalize climate adaptation and adaptive management throughout our agency.

The planning dynamics that have shaped this strategy are critical to understand. Over the last 30 years, we have invested over a billion dollars in water efficiency and demand management, leading to significantly declining water use across Southern California. While this has been an environmental success, it has resulted in reduced water sales and revenue at a time when we face multiple challenges—most notably climate change and the necessity of maintaining our vast, century-old infrastructure that transports water from the Colorado River and Northern California.

Our ongoing transformation from an agency focused solely on importing water to one that actively enhances resilience through local supply diversification demonstrates our commitment to adapting to these challenges. We have already amassed storage of record-setting dry-year supplies made possible by our regional efficiency and conservation achievements, and recent good rain years. Yet, as Metropolitan incentivized the construction of local recycling as well as other forms of demand management, and storage, we drastically reduced the sale of imported water and thus our main source of revenue.

Fortunately, through our local resilience, we gained a head start as the reliability of our imported sources is declining. On the Colorado River, we face increased competition from states like Wyoming, Colorado, Utah, and New Mexico for severely climate-impacted water resources. Since losing half of Southern California's Colorado supplies in 2003, Metropolitan has steadily made innovative investments in farm water conservation, ensuring a more reliable water supply for the Colorado River Aqueduct. A successful resolution to ongoing negotiations among the seven basin states that also include Arizona and Nevada and Mexico, could enable us to replicate these conservation investments across state lines to bolster the overall resilience of not only California, but the entire Southwest. But this will take more innovation and investment to accomplish.

Water resources from Northern California that must pass through the deteriorating Sacramento-San Joaquin Delta and its eroding levees are subject to significant supply risks. Regulatory obstacles and litigation currently exacerbate the difficulty in moving water south, as well as the ability to adapt to climate change. The State of California's potential construction of a $20 billion underground tunnel to protect from the risk of levee failure provides an alternative in a natural disaster and underscores the magnitude of the challenges we face. Metropolitan would bear the major portion of that cost, while continuing to contribute to the cost of maintaining and improving the current levee system benefitting our region as well as other areas of the State.

To withstand threats to our imported supplies building projects such as the $8 billion Pure Water Southern California treatment system in Carson, California, deserve serious consideration. Over time they can enable us to reuse billions of gallons of wastewater currently being discharged into the ocean. When and how to build the types of large projects I have described in these paragraphs without overburdening ratepayers, especially those with lower incomes, is a major objective of CAMP4W.

CAMP4W addresses our need to adapt financially, policy-wise, and politically from where we are today in the state of our infrastructure. The CAMP4W effort has facilitated the development of a new decision-making framework, essential for responding effectively to the multidimensional challenges that we are encountering along with the volatile climate.

On behalf of the Board, I would like to thank General Manager Deven Upadhyay for his disciplined and determined leadership; as well as his team, especially Chief Sustainability Officer Liz Crosson who patiently spearheaded the complex effort and who will guide us through its implementation. The team includes our Finance, Water Resources Planning, External Affairs, Engineering & Operations executives and staff as well as our Board support group. Committee Chair Matt Petersen and Vice Chair Karl Seckel brings vision and understanding to this effort; and Board Vice Chair Gail Goldberg and Finance Chair Tim Smith much necessary guidance. Finally, thank you to our member agency managers whose work is not done. I imagine them bringing the pragmatism of Metropolitan's founders striving to define the common benefits of Metropolitan's mission to a region that has been transformed into the 11th largest economy of the world.

I invite you to explore the Climate Adaptation Master Plan for Water and join us in this crucial endeavor. We also urge you to review our most recent SB60 report submitted to the California legislature outlining achievements in conservation, water recycling and groundwater storage. Our most recent report shows how residents have reduced water use by over 45% since the 1990's. It demonstrates that together, we can continue safeguarding our water future and building resilient communities for generations to come.

Adán Ortega, Jr.
Chair of the Board
Metropolitan Water District of Southern California

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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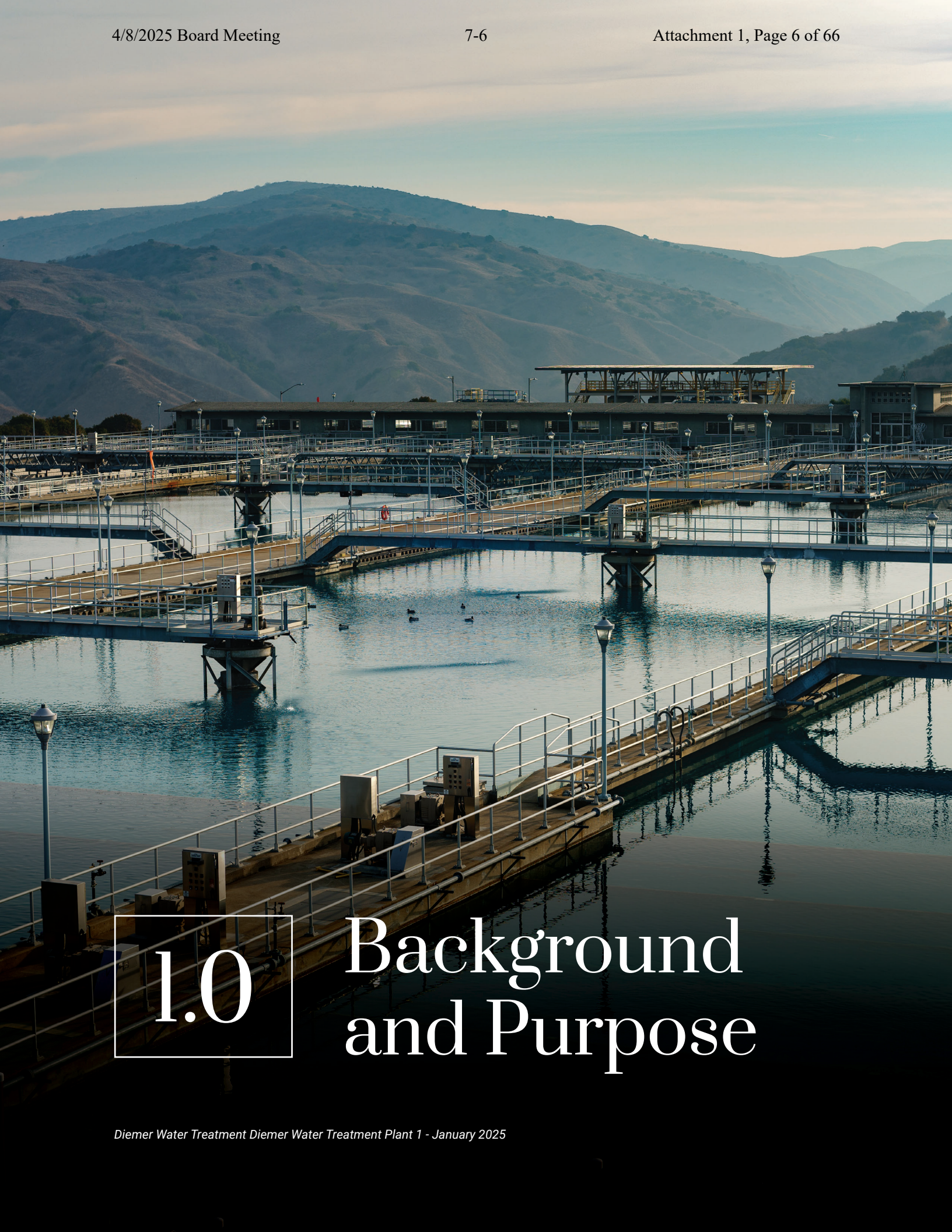


1.0 Background and Purpose

Diemer Water Treatment Diemer Water Treatment Plant 1 - January 2025

1.1 Problem Statement and Purpose of Climate Adaptation Planning and the CAMP4W Process

Climate change poses a significant threat to Metropolitan's ability to fulfill its mission and to the sources of water supply upon which Southern California relies. 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. Hazards from wildfire, extreme heat events, high winds, and sea level rise all pose risk to Metropolitan's critical infrastructure, such as those experienced during the 2025 wildfires, as well as to the ecosystems from which Metropolitan's water supply derives. There is no question that climate change is here and putting mounting pressure on the year-to-year management of our available water resources and infrastructure.

To ensure the continued reliability of water supplies for the communities we serve, Metropolitan embarked on the development of a comprehensive Climate Adaptation Master Plan for Water (CAMP4W), a comprehensive set of policy directives and decision-making tools that ensures the Board of Directors is equipped to consider climate risks to water supplies, water quality, infrastructure, operations, workforce, public health, and financial sustainability to its deliberations and investment decisions. It provides a roadmap to guide future investments and decision-making as we confront our new climate reality in the years and decades ahead.

By adopting the CAMP4W, the Board of Directors has directed staff to analyze planned programs and projects based on specific criteria that ensure consideration of climate change impacts and climate risk vulnerabilities throughout Metropolitan activities and to systematically institutionalize climate adaptation practices and policies to:

- Institute the consideration of climate change impacts and climate risks and vulnerabilities throughout Metropolitan activities;
- Enhance resource planning with the integration of climate and financial information;
- Increase the frequency of updates to resource needs and the factors that drive them;
- Set targets to guide the development of potential projects and programs to increase climate resilience and ensure continued reliability;
- Strengthen decision-making on project and program investments through greater transparency and more holistic and uniform analyses; and
- Establish an adaptive management approach to better manage uncertainty and remain responsive to evolving conditions.

1.2 Role of Implementation Strategy within the CAMP4W Process

The Climate Adaptation Master Plan for Water comprises multiple components which together form a living master planning program (Figure 1-1). Rooted in adaptability, Metropolitan's CAMP4W, through its implementation, will facilitate Metropolitan's continued reliability and resilience in the face of change and uncertainty while responding to real world conditions, course correcting as needed, and reducing the risk of over or under development. CAMP4W will allow the Board to balance the risks associated with either creating stranded assets or the devastating risk of having shortages or disruption in service, which would weaken Metropolitan's ability to achieve its core mission to provide safe, reliable water to its Member Agencies.

Through this CAMP4W Implementation Strategy, the Climate Decision-Making Framework, policy directives, partnership goals, and project and program timelines are combined to support near-term climate adaptation decision-making and implementation. Included is a defined set of new and ongoing tasks with an achievable timeline, the progress of which will be reported annually through the CAMP4W Annual Report. Modifications to the strategy will be made as needed to incorporate updated information and lessons learned. This adaptive management approach is depicted in Figure 1-1, presenting the key components in the development and implementation of the CAMP4W process.

Preparing for the future and providing a reliable supply of water to its Member Agencies are not new to Metropolitan. However, the CAMP4W process places adaptation in light of climate change at the forefront of planning, to intentionally look at all aspects of Metropolitan's resources, system and processes through a holistic lens and to transparently inform decision-making.

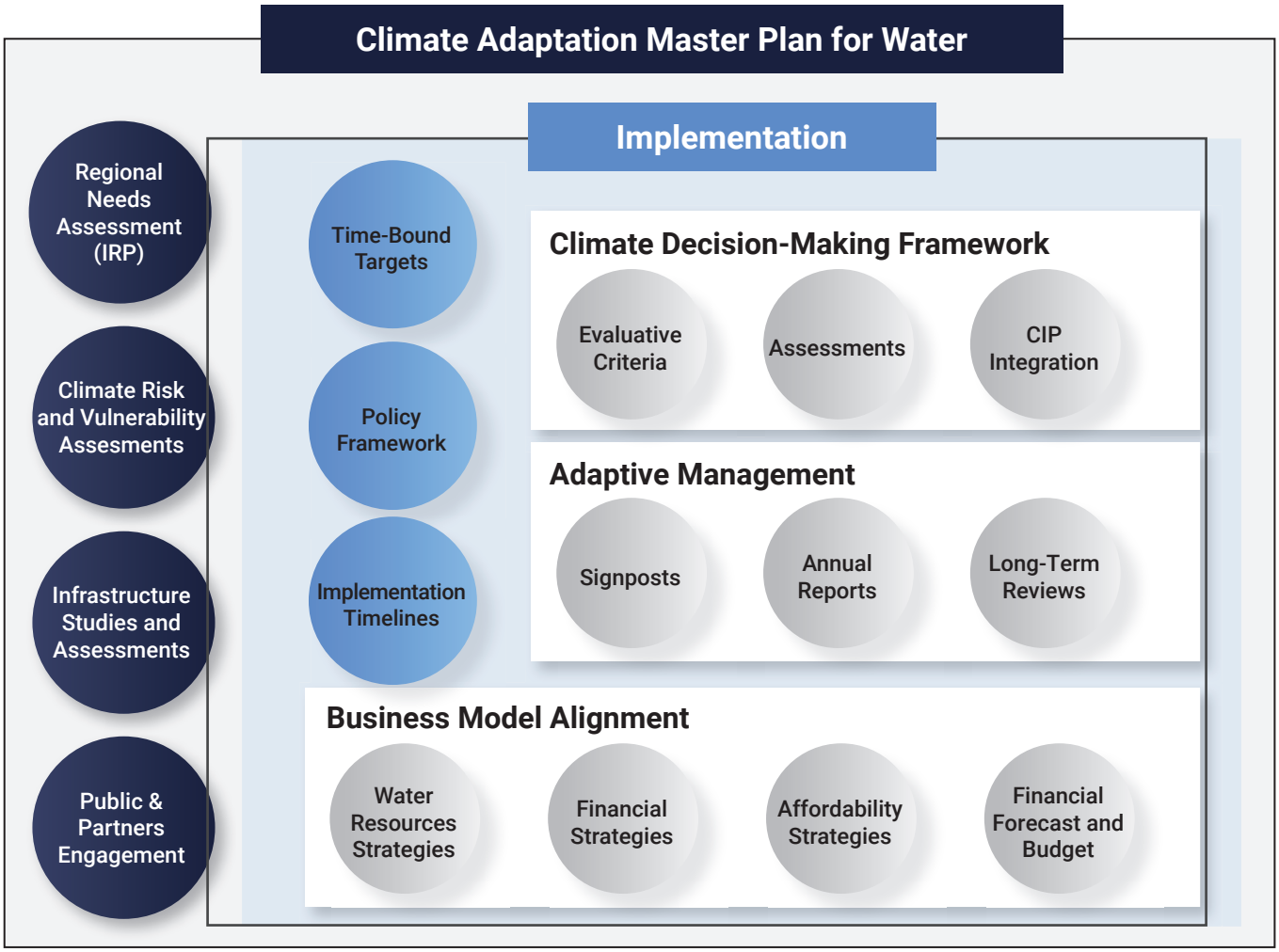


Figure 1-1. Climate Adaptation Planning Components

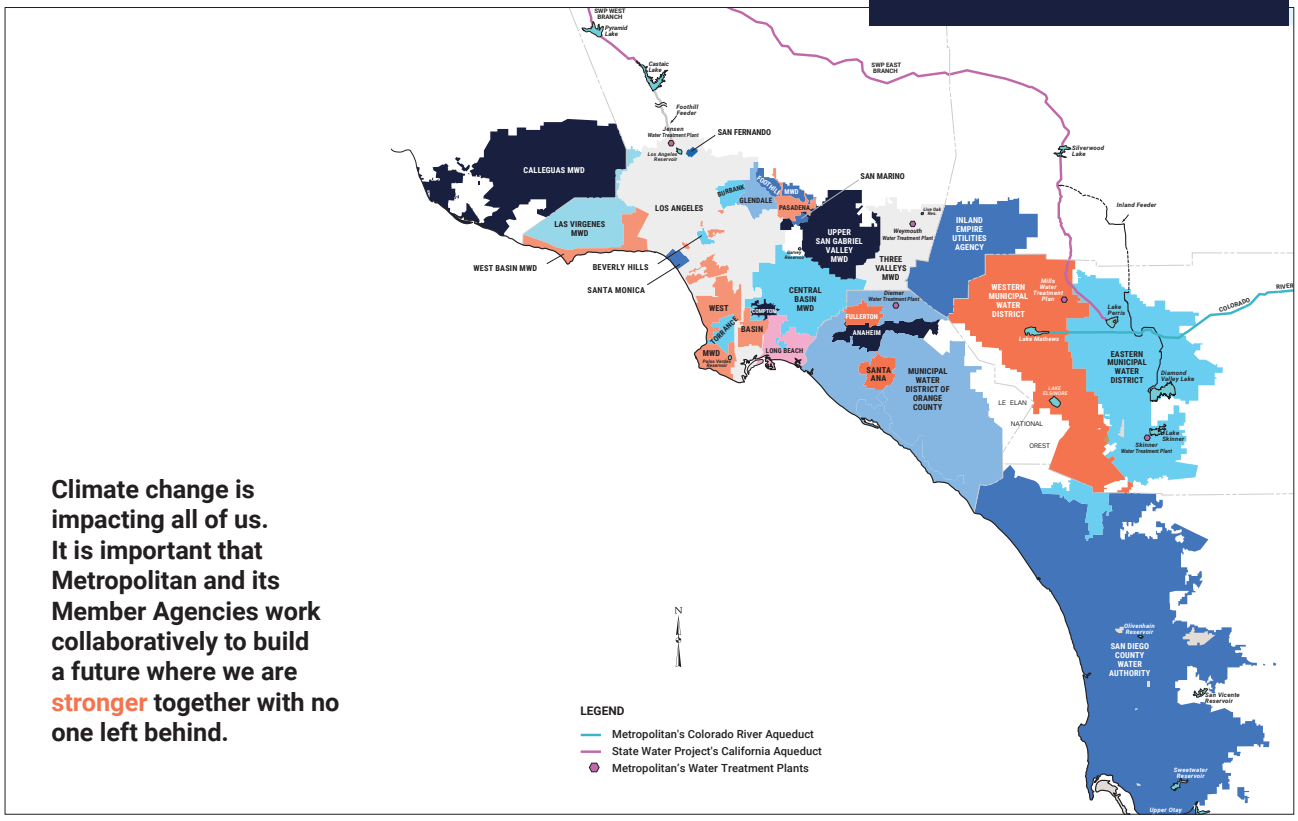
1.3 Metropolitan's Resources, System, Assets, and Member Agencies

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 imports supplies from the California Bay-Delta and the Colorado River, leads regional water use efficiency programs, invests in local water resources, and operates and maintains the Colorado River Aqueduct, 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 delivers approximately 1.5 billion gallons of water daily to its 26 Member Agencies (Figure 1-2), who serve the 19-million person service area across 5,200 square miles. Member Agencies (Figure 1) vary widely in terms of their size, whether they are retailers or wholesalers, their percent dependence on Metropolitan, and the climate they experience. 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 as well (DWR DAC Mapping tool[1]).

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.

Figure 1-2. Map of Metropolitan's Member Agencies and Major Facilities



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 | https://water.ca.gov/Work-Withy-Us/Grants-And-Loans/Mapping-Tools)

1.4 Public and Community Engagement

Ongoing public and community 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. Continuing the outreach efforts practiced throughout the CAMP4W development process and advancing the engagement goals are a core element of implementation. Engagement with interested parties, such as the environmental community and community-based organizations, will continue to ensure Metropolitan is integrating local knowledge and issues deeply understood by local and regional partners. 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.

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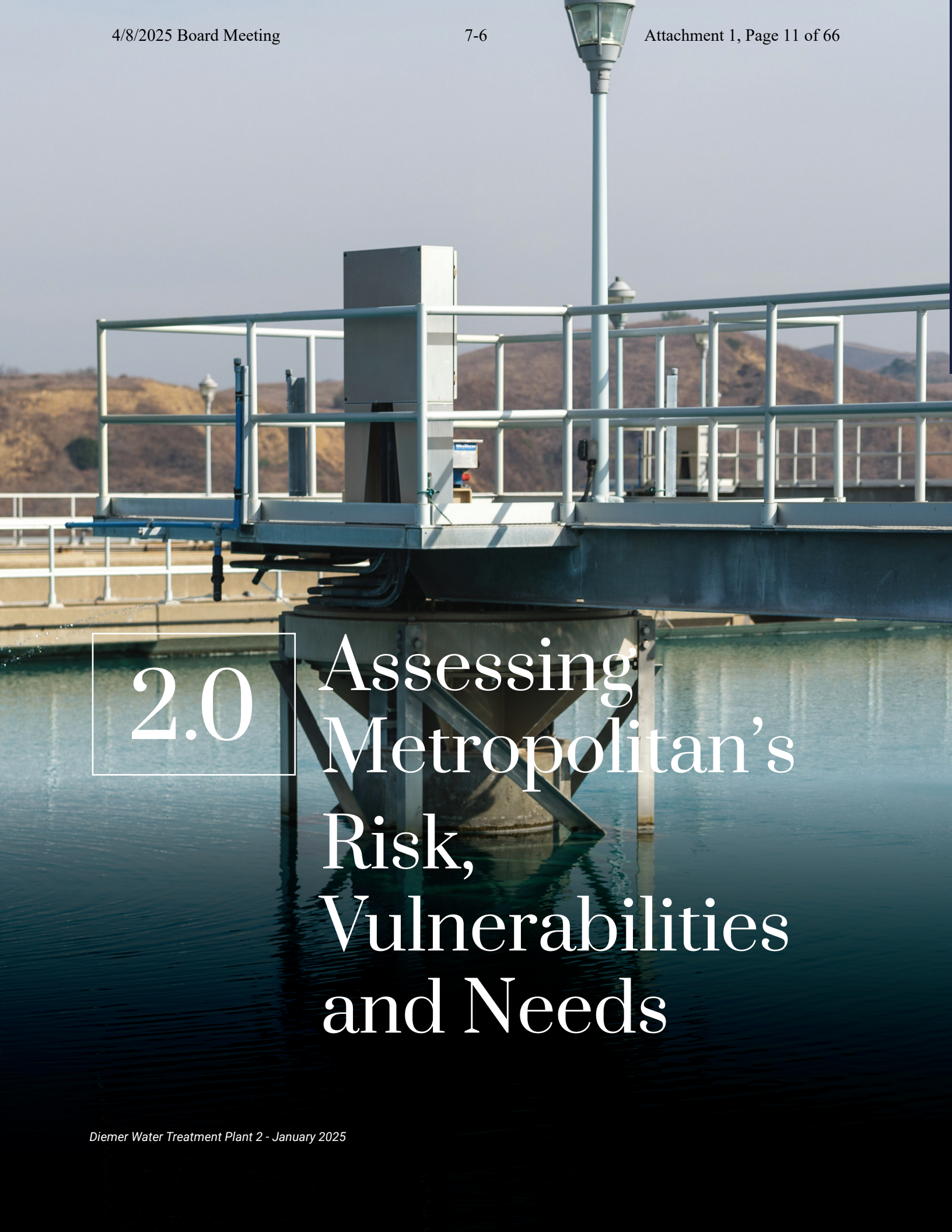


2.0 Assessing Metropolitan's Risk, Vulnerabilities and Needs

Diemer Water Treatment Plant 2 - January 2025

Worldwide, agencies are grappling with the reality that climate change is impacting our lives in a multitude of ways. Climate change is resulting in new and different risks and vulnerabilities for water systems and new and different needs for the people who rely on those systems. Decisions are being driven by extreme weather events such as drought, flooding, wildfires, heat waves, and windstorms, as well as sea level rise and the health of ecosystems, and the compounded impacts of climate change on other hazards such as earthquakes. Understanding risks and Metropolitan's vulnerabilities in the face of a changing climate is critical to establishing the region's needs for water supply reliability and infrastructure resilience. By considering potential risks and vulnerabilities, Metropolitan can best prepare to meet the needs of the region by making informed investment decisions and establishing a timeframe for implementation that is adaptable to changing conditions.

Developing strategies to address risks and vulnerabilities can be considered under two main categories. First, Metropolitan must consider effects on water supply reliability, which is impacted by fluctuating periods of drought and high rainfall as well as extreme heat events. Second, Metropolitan must bolster its infrastructure resilience to ensure operations and Member Agency support are maintained during and after hazard events that threaten or disrupt infrastructure.

The following sections discuss the process for evaluating risks and vulnerabilities, identifying water supply needs, and determining infrastructure resilience needs to ensure our water and power infrastructure remains resilient under anticipated future conditions.

2.1 Climate Risks and Vulnerabilities

Climate change poses significant risk to Metropolitan including the areas of drought, extreme precipitation, wildfires, sea level rise, extreme heat, and extreme wind events. As Metropolitan plans for the future, it must consider how these events will impact supply reliability and infrastructure resilience as well as how it will impact operations during emergencies. Understanding the risks is critical to properly assessing the best way to address them.

Workers in Action on Badlands Tunnel Project 2 - 2025

Multiple Climate Risks Impact Metropolitan from Water Supply to Infrastructure

Extended Droughts: Water Supply[1]

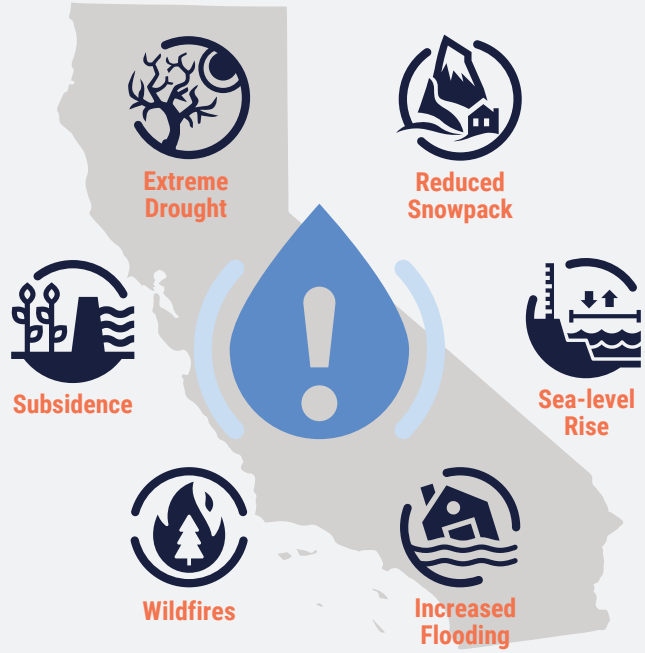
Both of Metropolitan's major imported water sources, the Colorado River and the Northern Sierra, are threatened by extreme and extended droughts

Sea-level Rise: Water Quality[2]

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.

Extended Droughts: 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.



Increased Flooding: Infrastructure Damages[3]

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: Infrastructure Damages[5]

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: Infrastructure Risks[6]

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.

Wildfires: Infrastructure Risks[4]

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.

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

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

3 *Storm damage to CRA turnout infrastructure near Whitewater, February 2019*

4 *Hurst Fire (800 acres) starts near Jensen 1/7 10:29 PM*

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

6 *Hughes Fire (10,000 acres) starts near Castaic Lake 1/22 10:53AM*

2.2 IRP Needs Assessment

For decades, assessing Metropolitan's water supply needs has been accomplished through a robust integrated planning process and evaluation of projected future conditions, beginning 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 process 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 2-1), the range in the water supply gap was determined, as shown in Table 1.

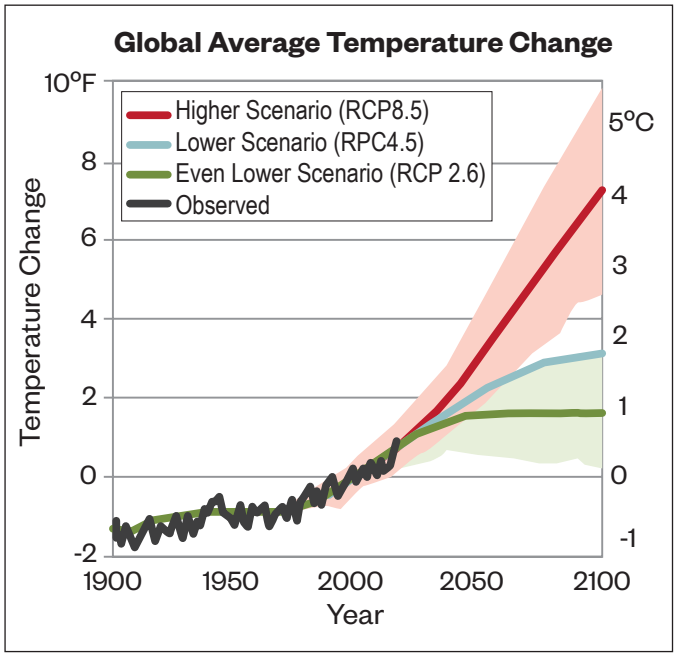
To support an adaptive management process, updates to the IRP Needs Assessment will occur at regular intervals, established based on trends that occur over time rather than reacting to short-term conditions which may reverse on a year-to-year basis. This has resulted in the selection of a five-year IRP Needs Assessment update cycle, as presented in Sections 5 and 6. In addition, there remains the need to keep the Board informed on an annual basis of how certain parameters are tracking over time. This will be accomplished through the Annual Reporting process which is further described in Section 5.3 and presented in the timeline in Section 6.

SCENARIO PLANNING

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

↓

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



IRP NEEDS ASSESSMENT IDENTIFIED THREE CATEGORIES OF SUPPLY

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

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

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

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

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

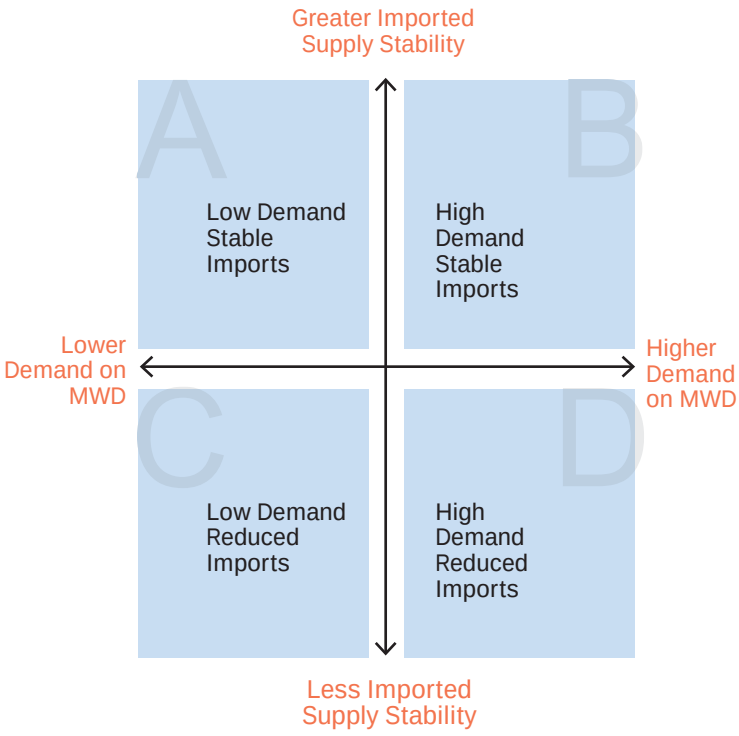
** TAF=thousand acre-feet; 1 acre-foot is the amount of water that would cover an acre of land at 1-foot depth*

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



2.3 Infrastructure Resilience

To maintain a reliable water supply, Metropolitan must ensure that its existing and future infrastructure is resilient in the face of a changing climate and the compounding risk associated with natural disasters, such as earthquakes and wildfires. Infrastructure investments are also critical to advancing power reliability, continued system operation, asset management, infrastructure reliability, and energy sustainability. Infrastructure projects are comprised of both replacement and refurbishment (R&R) projects, which serve to maintain the existing system, and new projects to enhance system capabilities.

Metropolitan has a long history of evaluating risks and vulnerabilities to ensure its system is able to support its core mission. Metropolitan identifies potential projects and programs through several planning processes initiated by various groups within Metropolitan, which can be categorized into the five areas shown in Figure 2-2. The Water Supply Reliability component addresses Metropolitan's ability to supply water to meet Member Agency demands under all foreseeable hydrologic conditions. The System Capacity component addresses Metropolitan's ability to convey, treat, and distribute supplies to meet firm demands under peak conditions. The Infrastructure Reliability component addresses Metropolitan's ability to maintain facilities in readiness to ensure system deliveries. The System Flexibility component addresses Metropolitan's ability to respond to short-term changes in water supply, water demands, and water quality and meet Member Agency water demands during planned or unplanned facility outages. The Emergency Response component addresses Metropolitan's ability to respond quickly to unplanned outages to restore service. By addressing each of the five reliability components, Metropolitan has developed a robust approach to ensure overall system reliability for its service area. While these processes have effectively identified projects and programs to meet Metropolitan's needs, changing climate conditions and increased uncertainty require additional considerations and criteria in project and program development and evaluation.

CAMP4W enhances the five categories of system reliability planning with climate adaptation considerations and addresses the compounding risks and vulnerabilities Metropolitan faces due to climate threats. Enhancements are reflected in the Policy Framework, Climate Decision-Making Framework, and Adaptation Strategies presented in Sections 4, 5 and 6.

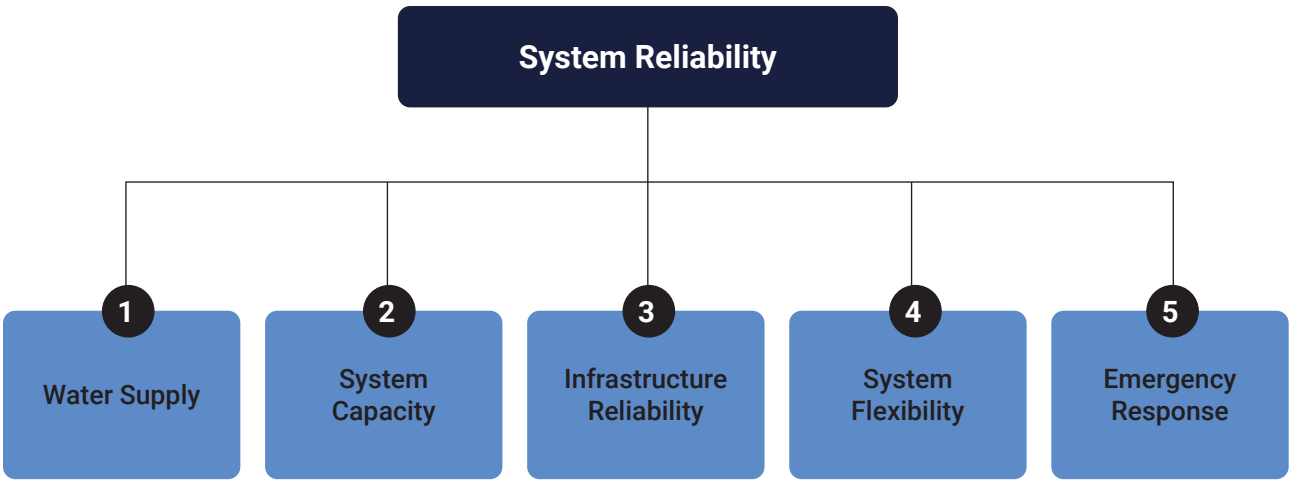


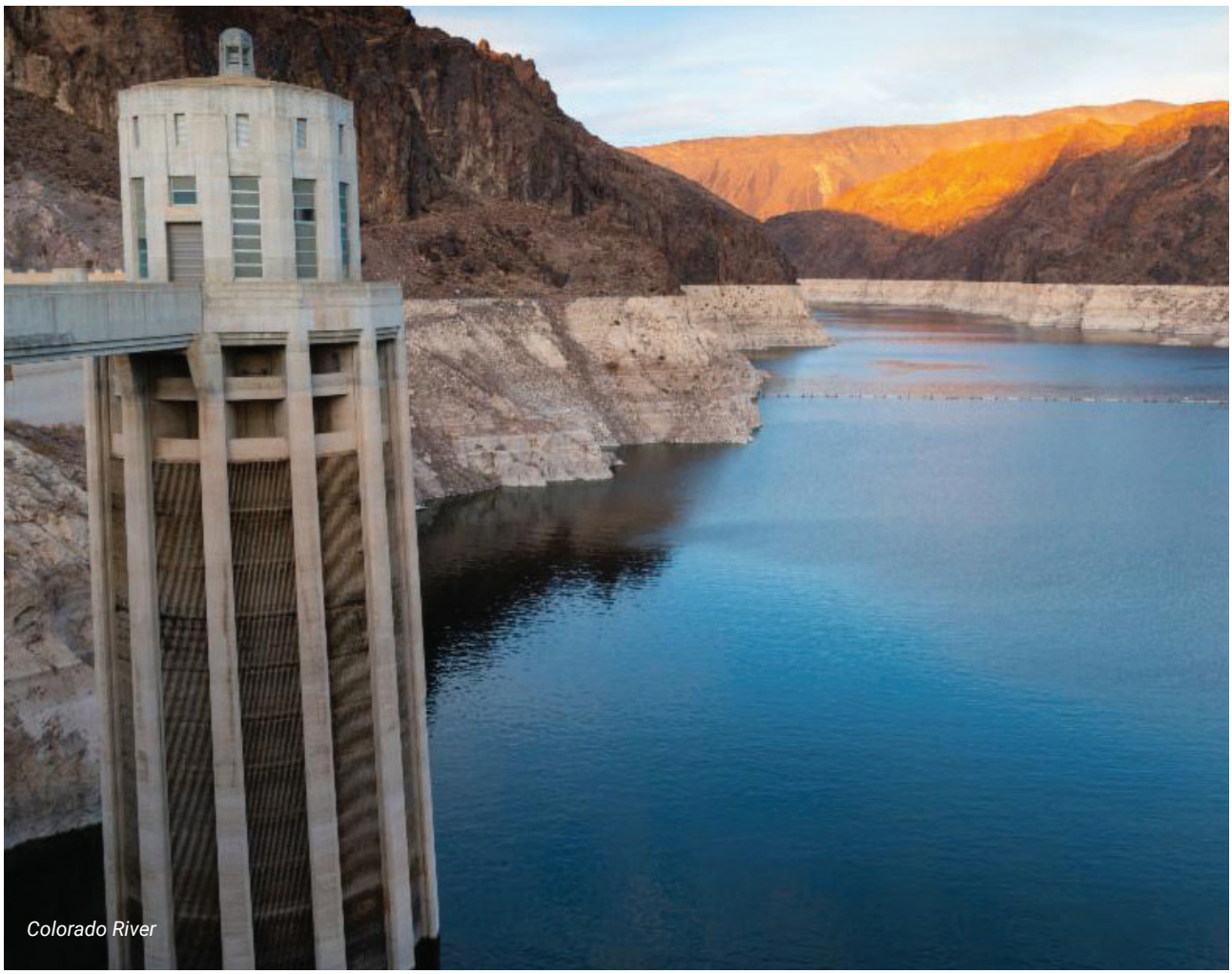
Figure 2-2. System Reliability Strategy

2.4 Water Quality Resilience

Maintaining Metropolitan's high water quality standard is essential to meeting Metropolitan's core mission and imperative to protecting public health. However, the compounding impacts of climate change including wildfires, drought, and extreme weather events, coupled with warming and extreme heat, are introducing new water quality challenges in Metropolitan's water supplies. Some potential climate-induced impacts on water quality include:

- Increased salinity due to saltwater intrusion and higher rates of surface water evaporation.
- Elevated turbidity and pollutant loads caused by high runoff events during extreme wet periods.
- Increased nutrient pollution and associated problems with harmful cyanobacteria blooms (cyanotoxins).
- More frequent reservoir anoxia and associated problems such as elevated manganese and sulfide concentrations.
- Increased chlorine demand and microbial activity such as nitrification in the distribution system.

Adapting to these water quality challenges may require investments in mitigation measures at source waters, more advanced water treatment processes, and improved management of the treated water distribution system. Climate change may push needed investments beyond what is required for general operations and maintenance and instigate a need for strategic infrastructure upgrades to address all water quality vulnerabilities. Additionally, water quality regulatory standards have become more stringent over time and this trend is expected to continue, making it more difficult to balance source water variability with evolving treatment and storage strategies.



Colorado River

For these reasons, water quality-focused adaptation strategies will be critical for long-term water quality resilience. Some actions that Metropolitan may consider through the CAMP4W process include:

- Enhancing research, mitigation, and response planning for high priority climate-induced water quality impacts.
- Expanding field monitoring, including increased use of innovative methods (e.g., automated samplers, remote sensing), to closely track source water quality and improve early detection capabilities at strategic locations.
- Optimizing operational strategies for raw water conveyances and storage reservoirs to mitigate declining water quality trends.
- Investing in infrastructure improvements (e.g., reservoir aeration, hypolimnetic oxygenation systems, chemical treatments to stabilize sediment nutrients) for higher risk parts of the source water system.
- Identifying and advocating for watershed management strategies to reduce point-source and diffuse nutrient and sediment pollution to address emerging water quality issues (e.g., more frequent and severe cyanotoxin-producing blooms, extreme turbidity events).
- Enhancing water treatment operations to address more frequent or extreme water quality challenges through process optimization and technology advancements.
- Upgrading water quality laboratory capabilities to expand sampling capacity, improve detection of new/emerging pollutants, and accelerate sample turnaround.

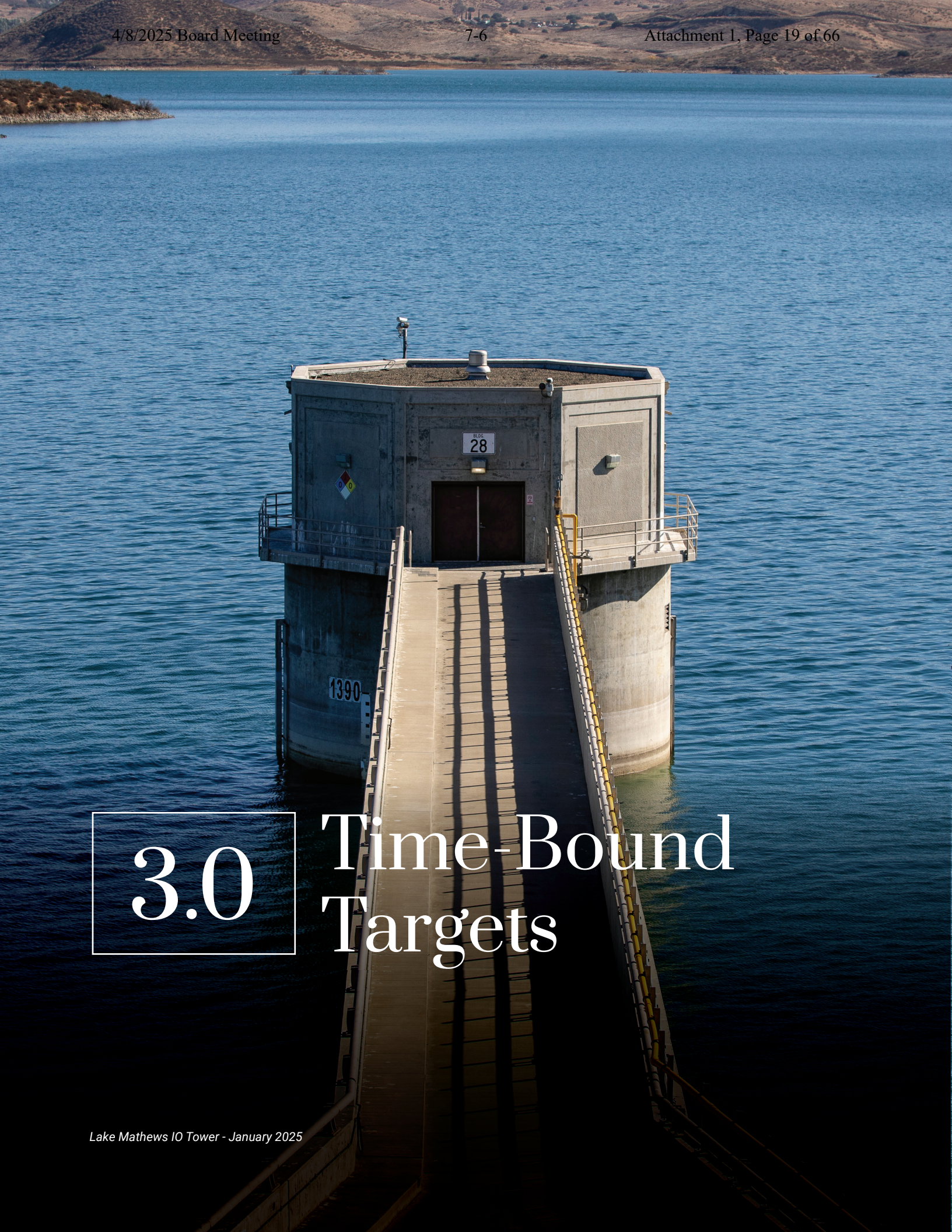
Moving forward, it will be essential to identify impacts and build specific protections around the direct and cascading impacts of climate change. By prioritizing water quality resilience, Metropolitan can safeguard its ability to provide high-quality water to the region even in the face of extreme climate-driven conditions.

Examples of Water Quality Concerns Exacerbated by Climate Change

Treatment facilities and operations have evolved over time to provide Metropolitan with significant flexibility in terms of level of treatment and ability to blend water from different sources. Climate change is likely to place additional stress on the ability of existing systems to accommodate future variability.

For example, more frequent and severe harmful algal blooms could limit access to certain reservoirs for extended periods, reducing source water availability and increasing pressure on treatment operations. Additionally, shifting demand patterns—driven by long-term reductions in treated water demand and short-term fluctuations between wet and dry years—have created operational challenges, requiring systems to adjust to greater variability in both water quantity and quality. Compounding these challenges, increasingly stringent water quality regulations are expected to drive up treatment costs and may require additional treatment processes.

Proactively planning for these and other stressors is imperative for Metropolitan to remain resilient and adapt in the face of a changing climate, while continuing to deliver high-quality water to the region.



3.0 Time-Bound Targets

Lake Mathews IO Tower - January 2025

Rialto Feeder - Inland Feeder Interie Project 1 (Decem 2024)

Time-Bound Targets will help guide the Board in making investment decisions. The targets are based on sound data analysis and the needs of the region. They are categorized as resource-based targets and policy-based targets, both of which are critical to informing the Board decisions. Time-Bound Targets pair with the tracking of Signposts. A key aspect of the adaptive management process is to evaluate if Time-Bound Targets require updating based on changing conditions. The following sections present the Time-Bound Targets and Signposts that will support the Implementation Strategy.

3.1 Resource-Based Time-Bound Targets

Resource-Based Time-Bound Targets are intended to guide investment decisions by defining the water supply needs required to address the gaps identified in the IRP Needs Assessment. These targets are based on the robust modeling and evaluation process completed during the most recent IRP update but are adaptive. They will be reviewed and may be updated when the IRP Needs Assessment is updated based on current trends and other factors that may impact needs at that time.

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		

Notes

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

To remain adaptive to climate change, the Resource-Based Time-Bound Targets are independent of the selection of a specific future scenario, as no single future scenario can be predicted. By identifying actions needed to close the gap in Scenario D, which aligns with the Board's directive to plan towards Representative Concentration Pathway (RCP) 8.5, we ensure planning coverage across all scenarios. The intentional use of the term "identify" in the Time-Bound Targets for core supply and storage should be noted. This target specifically addresses the need to identify opportunities, where as implementation of selected options will be done at the discretion of the Board over time, based on IRP updates, Signpost tracking, and other factors such as risk tolerance. This ensures we plan appropriately by identifying opportunities early enough to be well informed prior to any investment decision on implementation, given the long lead-time required for project development. This methodology supports Metropolitan's core mission and will facilitate the region being adequately prepared and not unprepared for a given future.

3.2 Policy-Based Time-Bound Targets

Policy-based Time-Bound Targets are designed to guide Metropolitan's investment decisions towards projects, programs, initiatives, and partnerships that advance the policy objectives identified through the CAMP4W process. Some policy-based Time-Bound Targets identify measures that will encourage resource-based development goals to be met through preferred alternatives (e.g., conservation measures). Others set and support goals that function in parallel to resource-based development (e.g., greenhouse gas emissions targets). As with resource-based targets, policy-based targets are adaptive and can be revised over time as deemed appropriate.

Policy-Based Targets

CATEGORY	NEAR TERM	MID TERM	LONG TERM
Equitable Supply Reliability	Add 160 CFS capacity to the SWPDA by 2027	Implement additional 130 CFS capacity to SWPDA by 2032	Implement capacity, conveyance, supply, and programs for SWPDA by 2045
Local Agency Supply[1]	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[2]	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[3]		
	GPCD target for 2030[4]	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		
Community Equity*			
Water Quality*			
Imported Water Source Resilience*			

*Time-Bound Targets remain in the development phase and will be refined in 2025.

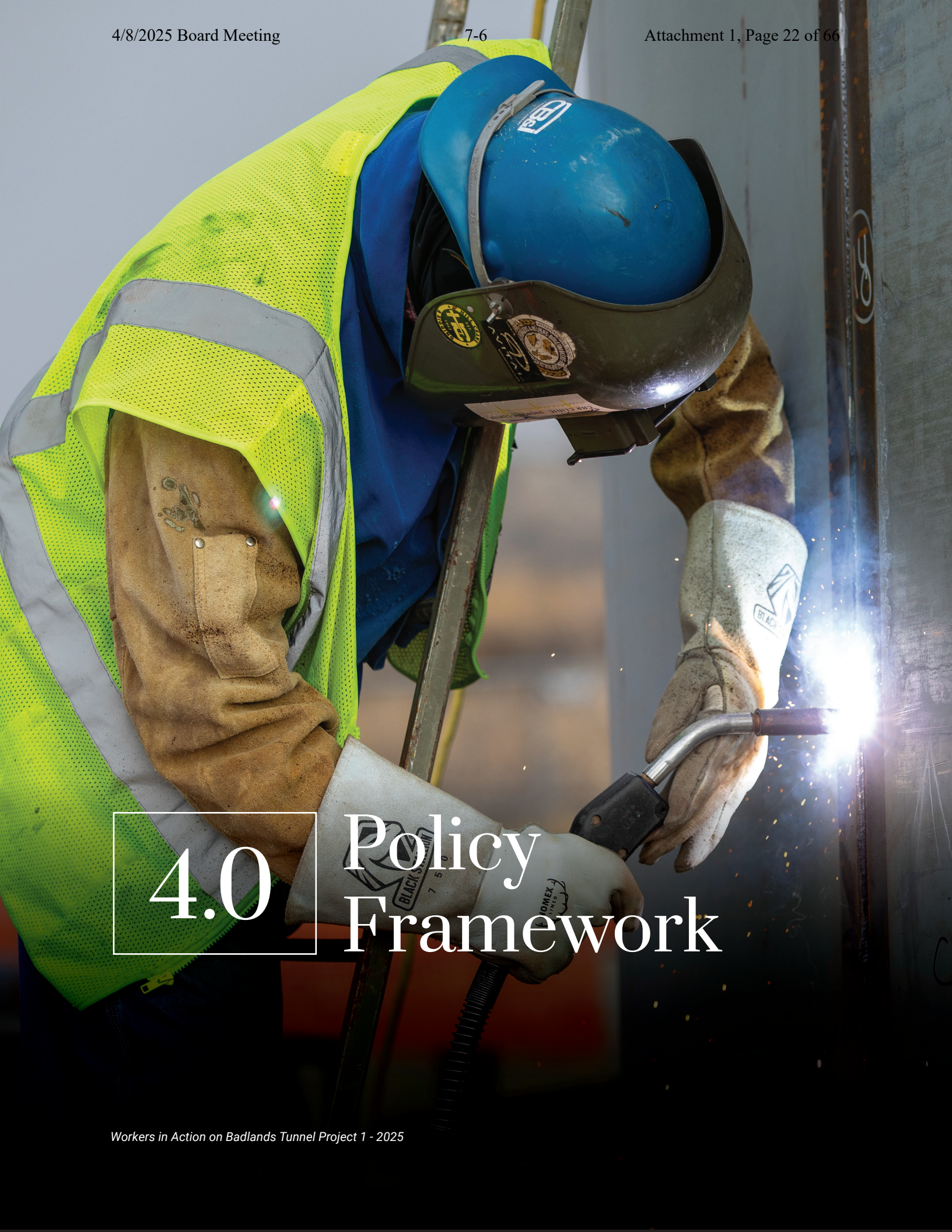
Notes

1 This initial target includes existing (and under construction) local agency supplies and can be augmented to include new local agency supply.

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

3 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.).

4 Specific GPCD Time-Bound Targets will be identified 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.



4.0 Policy Framework

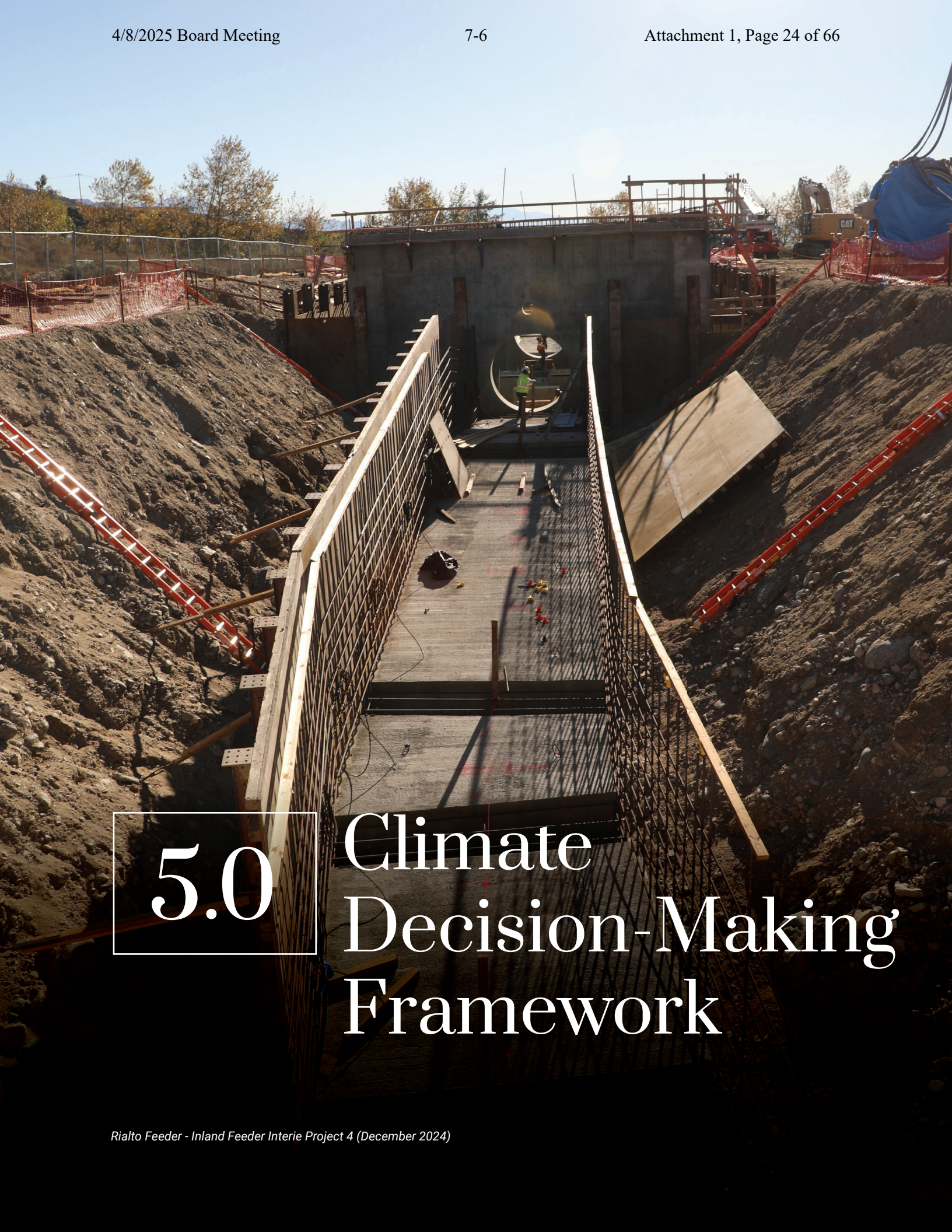
Workers in Action on Badlands Tunnel Project 1 - 2025

4.1 Climate Adaptation Policy Framework

The Climate Adaptation Policy Framework comprises five high-level policy statements, which support each of the Board-identified priority areas of Reliability, Resilience, Financial Sustainability, Affordability and Equity. In general, the Policy Framework will guide the implementation strategy (Section 6) and efforts to:

1. Systemically integrate climate adaptation to increase climate preparedness, deepen internal knowledge and understanding of impacts, and improve climate hazard response
2. Update existing and set new policies to strengthen the role of adaptive management and climate adaptation in Metropolitan's initiatives and decision making
3. Underscore the value of the Metropolitan Member Agency cooperative and other partnerships in achieving regional climate resilience

POLICY FRAMEWORK	IMPLEMENTATION EXAMPLES
Reliability Metropolitan will consider climate risks and integrate climate adaptation and risk reduction strategies into water supply programs, policies, planning, and operations.	✓ Incentives for member agencies to increase regional water resilience ✓ Infrastructure projects to improve access to water supplies ✓ Watershed resilience projects to strengthen imported supplies ✓ Programs to actualize benefits from wet weather year ✓ Expand monitoring and predictive modeling to anticipate water quality challenges at strategic and high risk locations
Resilience Metropolitan will integrate climate risk and vulnerability assessments for climate-related hazards, including drought, extreme heat and precipitation, sea level rise, flooding, and wildfire, using the best available climate science and climate change information into planning, implementation, and operations.	✓ Develop Resilient Infrastructure Guidelines ✓ Develop response indicators and action plans for primary climate threats to water quality ✓ Assess power system vulnerabilities ✓ Review workforce and equipment safety measures for climate risks ✓ Update fire management plans for critical facilities
Financial Sustainability Metropolitan will reduce short-term and long-term climate-related financial risks through periodic reviews and potential refinement of its business model, active monitoring and managing of financial conditions, and by maintaining flexible financing alternatives.	✓ Track financial implications of climate-induced expenses ✓ Consider updates to reserve policy ✓ Consider adjustments to fixed and variable rate structures
Affordability Metropolitan will continue to support retail user affordability efforts that support our mission to provide regional wholesale water service in the most economically responsible way.	✓ Identify new partnerships, grants, and revenue sources for climate adaptation ✓ Work with Member Agencies to identify funds for statewide low-income rate assistance ✓ Enhance water conservation incentives to reduce financial impacts
Equity Metropolitan will engage with the diverse communities we serve to listen, communicate transparently, and co-create solutions for greater equity in climate adaptation planning and implementation.	✓ Develop community engagement standards ✓ Develop environmental justice and community benefits policy



5.0 Climate Decision-Making Framework

Rialto Feeder - Inland Feeder Interie Project 4 (December 2024)

The desire to develop a standardized methodology to evaluate climate adaptation investments and inform decision-making was a primary driver for initiating the CAMP4W process. One of the goals from the beginning of the process was to ensure common data and analyses are applied consistently and transparently, and in consideration of a changing climate and deep uncertainty.

The Climate Decision-Making Framework therefore defines a consistent, stepwise process of making project and program investment decisions (Figure 5-1). 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 5.1 illustrates the high-level Climate Decision-Making Framework.

The following sections provide a more detailed discussion on key components, including the evaluative criteria and the project and program assessment tools and the integration process for how these elements will be infused into Metropolitan's processes. Also presented is the framework for monitoring and reporting as part of the adaptive management process, and the process for continuing to engage the public and interested parties to ensure transparency and input.

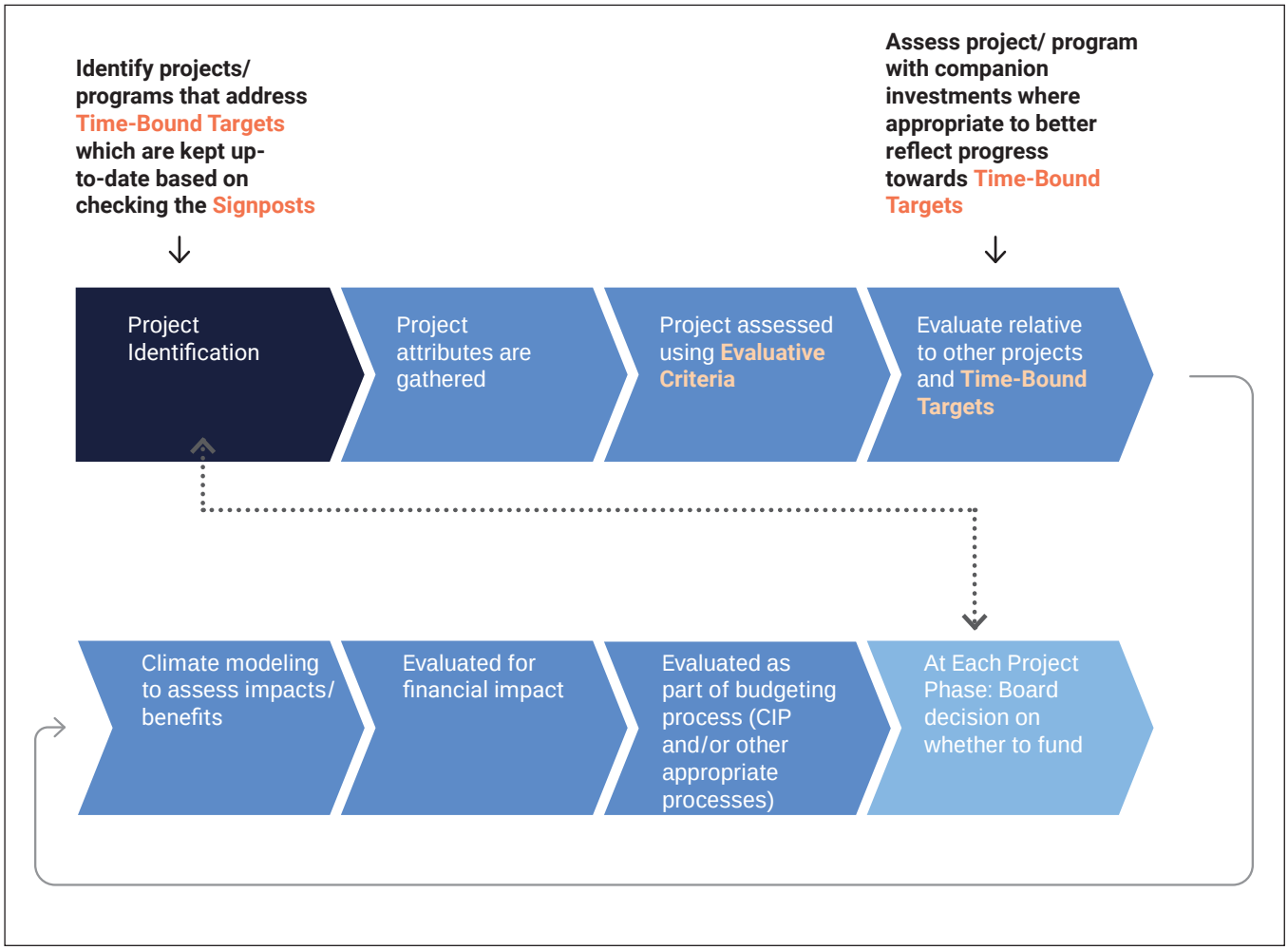


Figure 5-1. Climate Decision-Making Framework

5.1 Evaluative Criteria and Assessment Tools

Evaluative Criteria represents a defined set of metrics used to assess projects and programs and support the Board's decision-making process. Evaluative Criteria are used in collaboration with the Time-Bound Targets and Signposts to support decisions: Time-Bound Targets set the goals, Signposts assess real-world conditions to ensure the targets are appropriate, and Evaluative Criteria facilitates decisions for projects and programs to help Metropolitan move closer to the targets.

Figure 5-2 presents the Evaluative Criteria. Through the CAMP4W process, the Board expressed its preference to select an evaluation process that combines both quantitative and qualitative elements into the comprehensive assessment, supported by a series of questions. The Comprehensive Assessment Form is presented in Appendix A and will be used for all projects and programs evaluated under CAMP4W. This form, once completed, will be presented to the Board along with additional project and program supporting documentation to assist the Board in its deliberations.

The next section illustrates how this assessment approach integrates into the Board's overall decision-making process. Ultimately, decisions will be made by the Board at its discretion, and these tools will help facilitate a uniform, methodical, and transparent assessment process.

RELIABILITY	RESILIENCE	FINANCIAL SUSTAINABILITY & AFFORDABILITY
Supply Performance Equitable Reliability	Addresses known risks and vulnerabilities Project, Program or Portfolio's ability to perform under climate impacts	Total Cost, Unit Cost, Lifecycle 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 risks and vulnerabilities and how it performs under climate impacts.	Assess a project's financial sustainability and affordability based on its unit cost Total Cost, Unit Cost, Lifecycle Cost and other factors.
ADAPTABILITY & FLEXIBILITY	**EQUITY**	**ENVIRONMENTAL CO-BENEFITS**
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.

Figure 5-2. Evaluative Criteria

5.2 Integrated Implementation Processes

CAMP4W integrates climate adaptation into Metropolitan's existing processes to ensure a holistic approach and the efficient and effective delivery of projects and programs. Figure 5-3 presents the overall process. As shown, projects and programs meeting the threshold for CAMP4W evaluation receive additional analysis consistent with the rest of the existing processes.

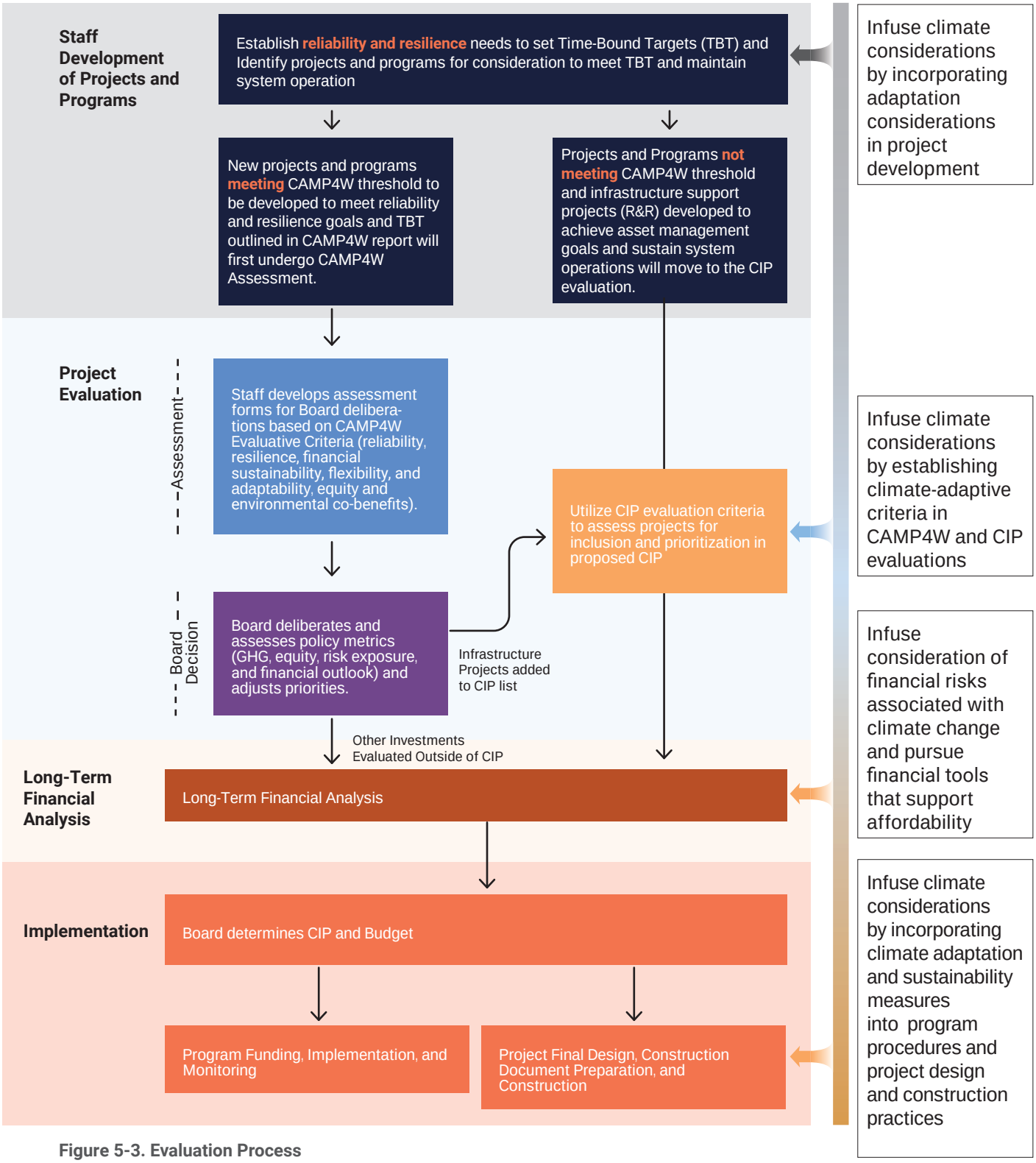


Figure 5-3. Evaluation Process

5.3 Adaptive Management, Monitoring and Reporting, and Signposts

Adaptive management is a cornerstone of the CAMP4W process. By embracing the need to be nimble and open to revision and adjustments over time, Metropolitan can manage uncertainty about the future and remain responsive to evolving conditions.

The CAMP4W Annual Report provides the structure for adaptive management by presenting key information on an annual basis to track trends and adjust Time-Bound Targets as needed. It provides a means for informing the Board on progress toward climate resilience and resource reliability.

The Annual Report will be used to support Board deliberations on investment decisions, understand if updates are required to the Time-Bound Targets, and identify any other area that requires an update. Content presented in the CAMP4W Annual Report includes the following:

- The status of each Signpost, which includes Water Supply Reliability Signposts, Infrastructure Signposts, and Financial Signposts, as presented in Section 5.3.1
- Updates on progress towards achieving the Time-Bound-Targets;
- Implementation highlights, which include projects, programs, policies, partnerships, initiatives, and public outreach.

Figure 6-1 presents a high-level overview of the schedule for CAMP4W reporting and updates.

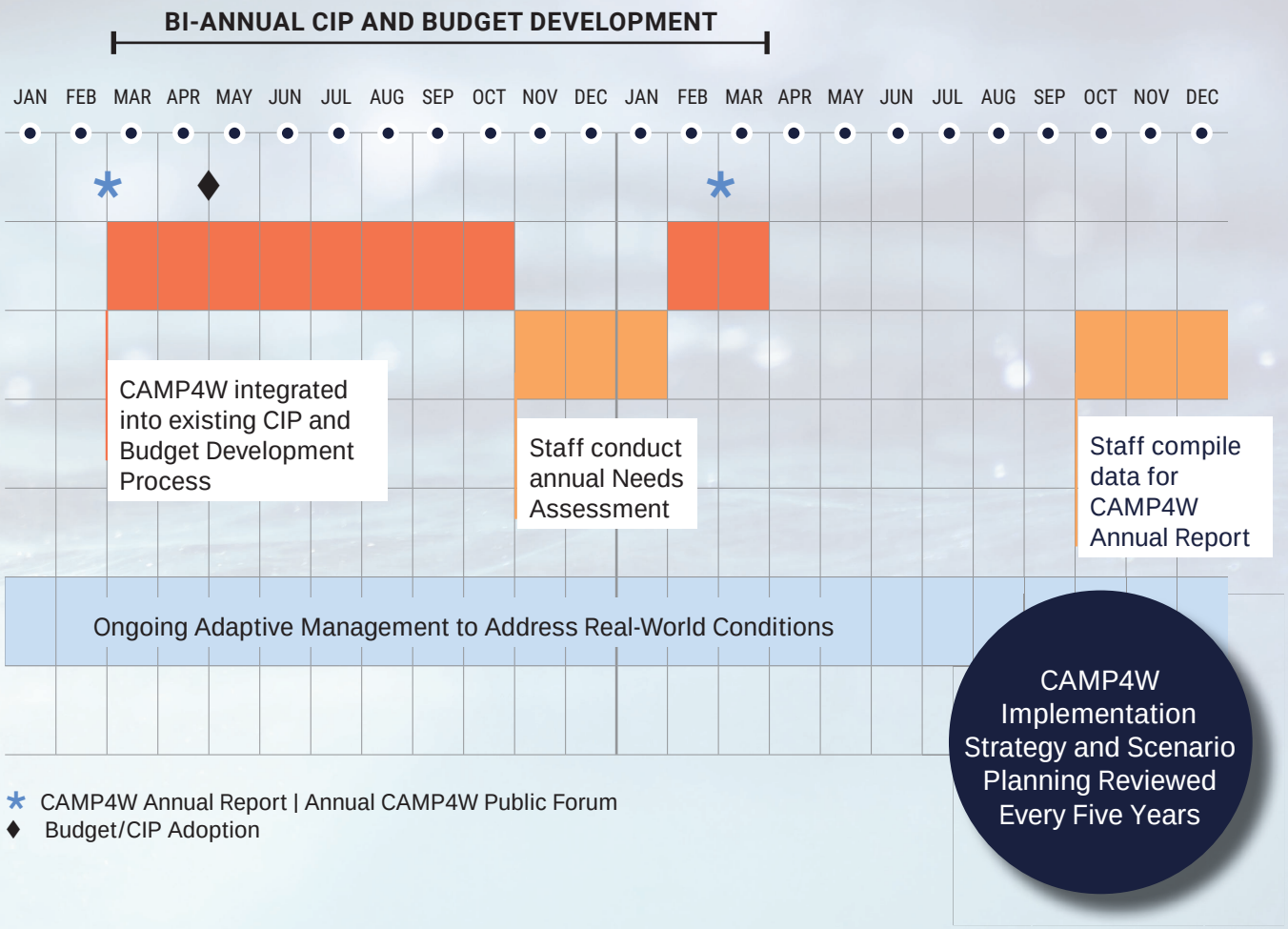


Figure 5-4. Schedule of CAMP4W Reports and Updates

Tracking Signposts will allow the Board to make investment decisions based on the most updated review of trends.

5.3.1 Signposts

As the scenario planning approach helps account for a range of potential supply gaps, tracking Signposts will facilitate regular updates to support Board deliberations by providing the most recently available data on an annual basis (see Section 5.3 for a discussion on annual reporting). Signposts serve as measurable indicators of the direction and trends of factors that can significantly impact decisions. Although Signposts do not eliminate uncertainty, they offer a data-driven understanding of patterns, helping to contextualize trends over time and enhance decision-making. The Signposts will serve as an important tool for adaptive management and to support decisions on project and program investments, strategy development, and initiatives. The CAMP4W Annual Report includes ongoing tracking of Signposts for water supply and demand as well as infrastructure and financial Signposts. The Signposts are presented below.

WATER SUPPLY RELIABILITY SIGNPOSTS

- Demographics
- Climate change
- Local agency supply
- Imported supply
- Storage

INFRASTRUCTURE AND FINANCIAL SIGNPOSTS

- Frequency of infrastructure R&R from climate related conditions
- Cost of infrastructure R&R from climate related conditions
- Emergency response frequency due to climate related impacts
- Emergency response costs due to climate related impacts

6.0 Adaptation Strategies and Five-Year Implementation Timelines

Rialto Feeder - Inland Feeder Interie Project 3 (December 2024)

6.1 Overview

The CAMP4W Time-Bound Targets and Policy Framework drive the development of adaptation strategies (projects, programs, initiatives, etc.) to ensure Metropolitan's reliability and resilience in a climate-impacted future. The Climate Decision-Making Framework focuses the assessment of projects and programs on the Board-identified priorities of Reliability, Resilience, Financial Sustainability and Affordability, Adaptability and Flexibility, Equity and Environmental Co-Benefits. Signposts help guide investment decisions by tracking real-world trends and informing the modification of targets as needed. Those elements define the process for the Board to make decisions over time.

This section presents the five-year timelines for climate adaptation and risk reduction strategies identified to date in the categories of projects, studies, programs, policies, and initiatives (Figures 6-1 and 6-2). While the development of most of the projects listed predated the CAMP4W process, those projects will be assessed using the CAMP4W decision-making framework to ensure consistency with the Board's priorities. Ongoing and newly initiated studies, programs and initiatives are also included as potential sources of new climate adaptation and risk reduction strategies for future Board deliberation.

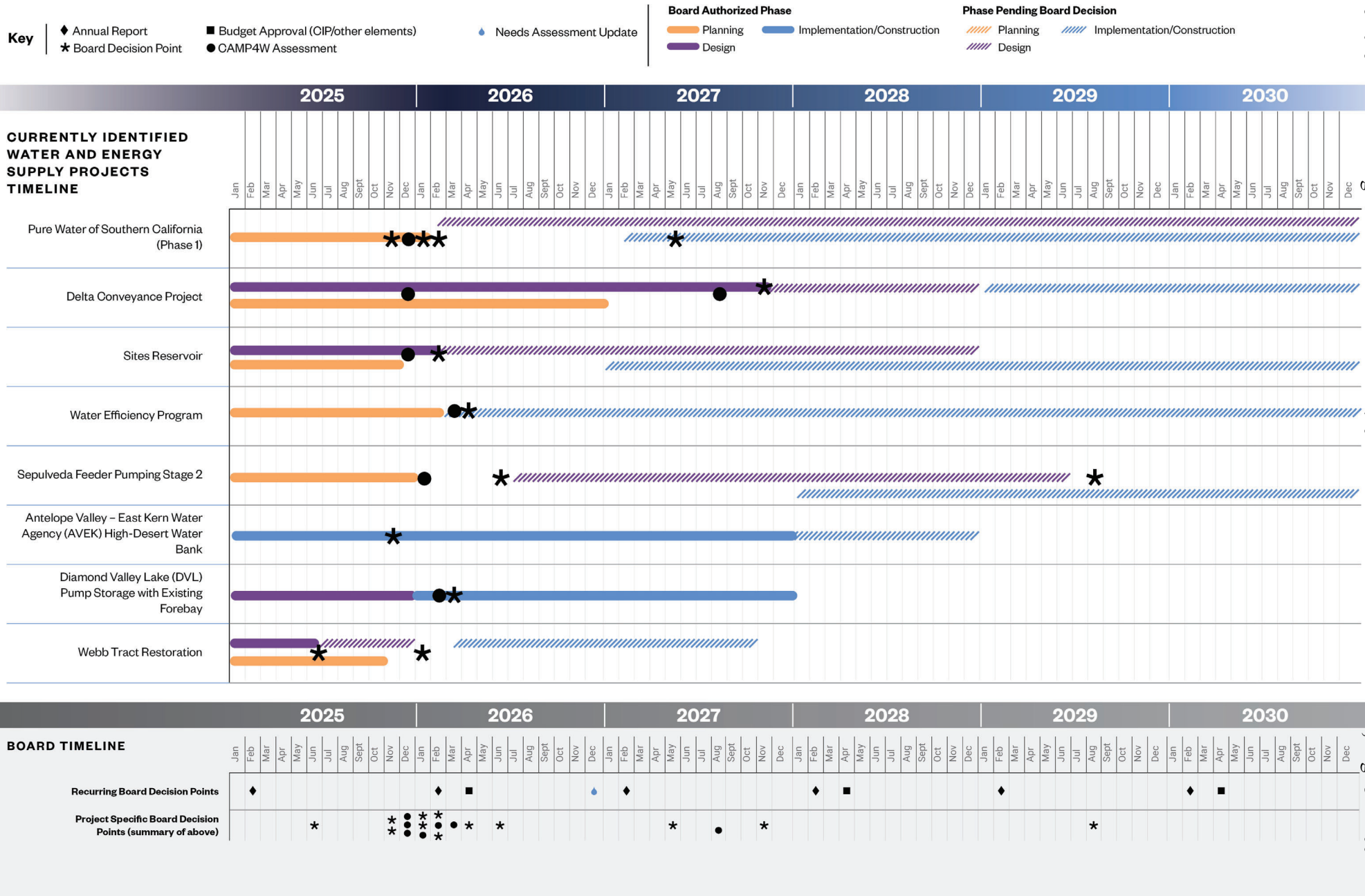
The timelines presented in Figures 6-1 and 6-2 include anticipated Board decision points as well as key milestones based on currently available information. The timelines provide the Board an overall understanding of the wide range of alternatives available to achieve the region's needs so that the most effective strategies are implemented based on a comprehensive assessment of each option. There is also a brief overview of identified climate adaptation strategies in Sections 6.3 and 6.4. Because this information is based on currently available information and data and each strategy is in a different phase of development, dates and processes are subject to change and will be updated as needed.

6.2 Implementation Timelines

The following Figures 6-1 and 6-2 present the implementation timelines for projects, programs, policies, and initiatives. The sections that follow provide a brief overview of each strategy identified. As this is an adaptive plan, the dates and list of strategies will be subject to change over time.

Adaptation Strategies: Water and Energy Projects Planned for CAMP4W Assessment

Timelines are subject to change based on new and evolving information



Adaptation Strategies: Studies, Programs, Policies and Initiatives

Timelines are subject to change based on new and evolving information

Key

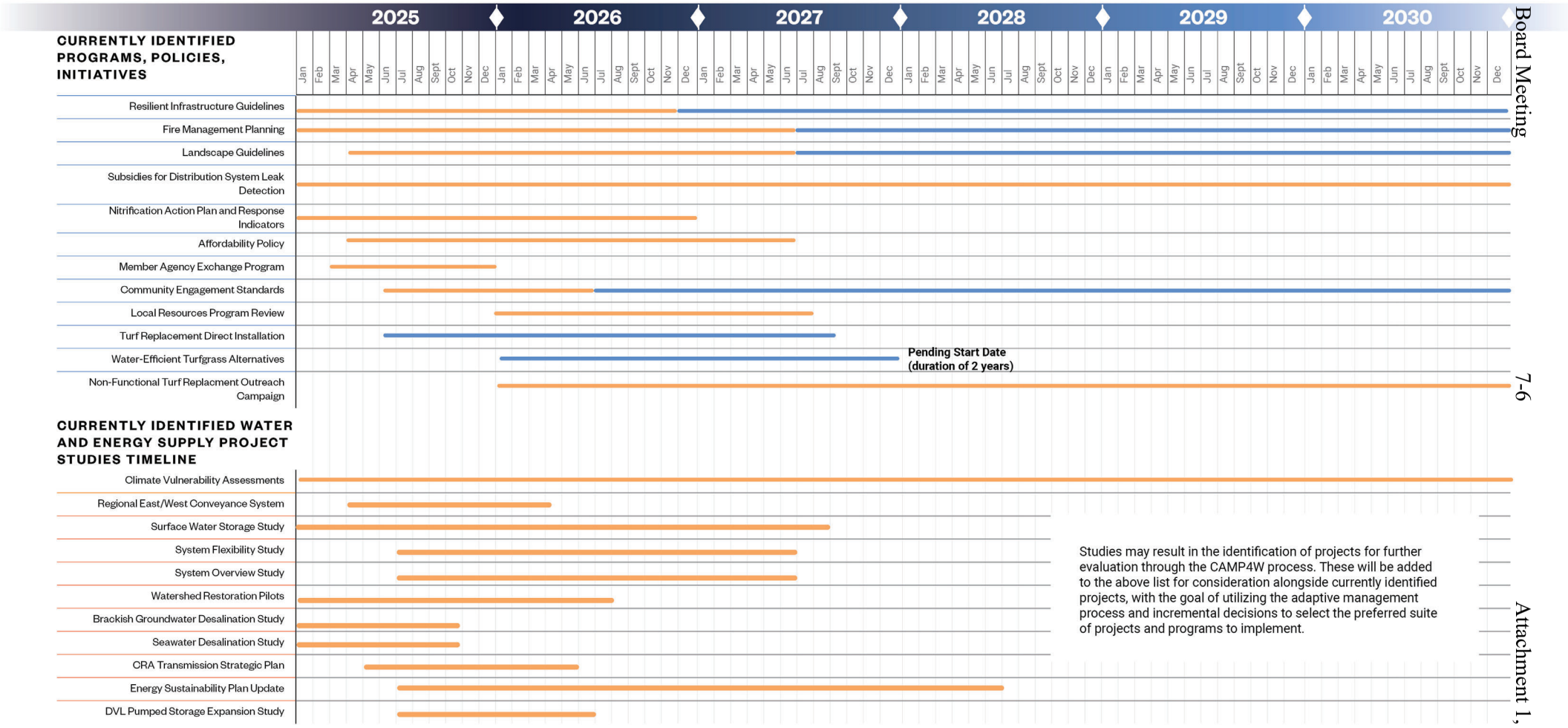
- ♦ Annual Report
- ★ Board Decision Point
- ■ Budget Approval Process (CIP/other elements)
- ● CAMP4W Assesment
- 💧 Needs Assessment Update

Board Authorized Phase

- Planning
- Implementation
- Design

Phase Pending Board Decision

- Planning
- Implementation
- Design



6.3 Projects

The adaptive management process will facilitate the selection and implementation of projects following CAMP4W Comprehensive Assessments and Board deliberation. This involves making investment decisions incrementally over time, at various stages (planning, design, implementation, etc).

Below is the initial list of projects that will be assessed under the Climate Decision-Making Framework that are either underway or will be underway in the next five years.

6.3.1 Pure Water Southern California Phase I and II

The Pure Water Southern California program is a partnership between the Metropolitan Water District of Southern California and the Los Angeles County Sanitation Districts. The program uses advanced water purification to recycle cleaned wastewater for indirect and direct potable use. It could produce up to 150 million gallons of water daily, enough for 1.5 million people.

6.3.2 Delta Conveyance Project

The Delta Conveyance Project is a conveyance project proposed by the California Department of Water Resources. It includes the construction of two new intakes on the Sacramento River in the north Delta, an underground tunnel 45 miles in length and 36 feet in diameter, and a pumping plant to lift water from the terminus of the pipeline into the Bethany Reservoir at the beginning of the California Aqueduct.

6.3.3 Sites Reservoir

The Sites Reservoir Project is led by the Sites Project Authority, a joint powers authority made up of irrigation agencies, water districts, cities, and counties in the Sacramento Valley. It is a proposed 1.5-million-acre foot off-stream reservoir designed to capture rainwater that would be integrated with the State Water Project and Central Valley Project.

Diamond Valley Lake IO Tower

6.3.4 Water Efficiency Program

Metropolitan's Water Efficiency Team offers a suite of programs and incentives including conservation rebates for indoor and outdoor water-saving measures, investments in innovative efficiency strategies, public outreach and marketing, sponsorships for community-based organizations, and education programs.

6.3.5 Sepulveda Feeder Pumping Stage 2

On the western side of the service area, Metropolitan is designing and will construct the first stage of two new pump stations (30 cfs) along its Sepulveda Feeder to allow delivery of up to 22,000 acre-feet of additional water annually from the Diemer and Weymouth Water Treatment Plants during SWP shortages. A potential second stage (160 cfs) is in the planning process and will be evaluated through the CAMP4W process.

6.3.6 Antelope Valley-East Kern Water Agency (AVEK) High Desert Water Bank Partnership

The High Desert Water Bank is a partnership with the Antelope Valley-East Kern Water Agency (AVEK) allowing Metropolitan to store and access State Water Project supplies in the Antelope Valley groundwater basin. The project includes recharge basins, recovery and monitoring wells, and a connection to the California Aqueduct. Additional treatment facilities are underway.

6.3.7 Diamond Valley Lake (DVL) Pumped Storage with Existing Forebay

Diamond Valley Lake, completed in the 1990s, was built to store up to 810,000 acre-feet of water. The existing adjacent forebay has the potential to provide pumped storage hydropower. Pumped storage hydropower is an energy storage solution where energy is stored and generated by moving water between two reservoirs located at different elevations. At times of low electricity demand, when energy is inexpensive or renewable supplies exceed demand, the excess energy is used to pump water to an upper reservoir; during periods of high electricity demand or cost, the stored water is released through turbines from the upper reservoir into the lower one generating clean energy.

6.3.8 Battery Energy Storage Systems

Metropolitan is adding battery energy storage systems (BESS) to existing solar facilities at the Jensen, Skinner, and Weymouth Water Treatment Plants to manage daily power use and costs as well as resilience during emergency events. The projects are partially funded by the California Public Utilities Commission's enhanced incentives for microgrid-capable BESS at critical facilities.

6.3.9 Webb Track Restoration

Webb Tract, located in the Sacramento-San Joaquin Delta region, is one of four islands owned by Metropolitan. Funded by the Sacramento-San Joaquin Delta Conservancy's Nature Based Solutions grant program, the Webb Tract Wetland Project is a multi-benefit approach to ecosystem restoration and sustainable farming.

6.4 Studies, Programs, Policies, and Initiatives

In addition to an anticipated timeline for evaluating projects (Figure 6-1), the Implementation Strategy includes proactive measures to assess and address climate risks. These strategies include programs, studies, policies, and initiatives (Figure 6-2). Below is an initial set of brief descriptions.

6.4.1 Resilient Infrastructure Guidelines

To ensure climate adaptation planning and implementation is integrated across Metropolitan, inclusive of all infrastructure projects including R&R projects and new infrastructure projects, Metropolitan will develop design guidelines based on engineering standards and climate adaptation and risk-reduction considerations.

6.4.2 Fire Management Planning

Metropolitan is assessing the fire-related risks and vulnerabilities at all its facilities. Critical facilities will undergo a more thorough assessment and fire management strategies will be developed and considered for implementation.

6.4.3 Landscape Guidelines

Metropolitan will develop landscape guidelines for consistent implementation at all Metropolitan facilities to address water efficiency and fire risks.

6.4.4 Subsidies for Distribution System Leak Detection

Reducing leaks in the distribution system directly benefits the region by reducing demands on Metropolitan. This program will evaluate alternatives to provide subsidies that will detect system leaks and establish how those subsidies will be developed, funded, and implemented.

6.4.5 Nitrification Action Plan and Response Indicators

Nitrification can at times be an issue in chloraminated drinking water systems and is caused by factors such as warm water temperatures and extended water age, due to long detention times during low demand periods. Given anticipated temperature increases and reduced demands, Metropolitan will develop response indicators and an action plan for addressing this water quality related climate threat.

6.4.6 Affordability Policy

Metropolitan will develop a policy for considering and integrating affordability considerations, including efforts to support retail agencies' affordability efforts. This will work towards continuing to support Metropolitan's mission to provide regional wholesale water service in the most economically responsible way.

Diamond Valley Lake

6.4.7 Member Agency Exchange Program

As Metropolitan reviews its current business model, facilitating exchanges among Member Agencies is under consideration. Establishing potential guidelines and conditions will provide options that incorporate Member Agency needs.

6.4.8 Community Engagement Standards

Metropolitan will develop community engagement standards to guide engagement activities and programs and inform project and program assessments under the Climate Decision-Making Framework.

6.4.9 Local Resources Program Review

Metropolitan has successfully implemented its Local Resources Program for decades, assisting Member Agencies with funding for critical projects that have increased regional reliability. Metropolitan will review the program and refine if needed.

6.4.10 Turf Replacement Direct Installation

The turf replacement program may benefit from direct installation, particularly for users with limited means to self-fund the turf replacement. Metropolitan will explore options and evaluate how a program of this type may provide the most benefits, both to increase the number of users and from a cost-effectiveness standpoint.

6.4.11 Water-Efficient Turfgrass Alternatives

New technologies and research studies are emerging, and Metropolitan will evaluate how those may benefit the region and how programs may be implemented.

6.4.12 Non-Functional Turf Replacement Outreach Campaign

The non-functional turf program provides resources to remove and replace non-functional turf (e.g., turf that serves limited use) with climate appropriate alternatives to reduce demands on Metropolitan. An outreach campaign provides consistent messaging and information for all potential users.

6.4.13 Climate Vulnerability and Risk Assessments

Metropolitan developed the initial Climate Vulnerability and Risk Assessment document to help plan towards a future impacted by climate change. To implement the findings of this and planned future efforts, Metropolitan must establish a uniform methodology for performing assessments across its service area.

6.4.14 Regional East/West Conveyance System Study

The Regional East/West Conveyance System Study would look at multiple scenarios for conveying untreated Colorado River water; stored water from DVL, AVEK, or Lake Mathews; and future Pure Water Southern California (PWSC) supplies to assess all alternatives.

6.4.15 Surface Water Storage Study

An initial study identifying potential locations for new surface storage has been completed. The study identified locations that are in-region and can provide a direct benefit to the western SWP-dependent area, as well as locations within the west San Joaquin Valley that can provide a benefit to the whole service area. The next phase of the analysis will refine the evaluation criteria and create a short list of sites for a more detailed evaluation.

6.4.16 System Flexibility Study

The System Flexibility Study considers Metropolitan's ability to respond to short-term changes in water supply, water demands, and water quality and the ability to meet Member Agency needs during planned or unplanned outages. Metropolitan frequently meets with Member Agencies to discuss the findings and evaluate potential solutions in the event that the modeled conditions were to occur.

6.4.17 System Overview Study

The System Overview Study is used to understand how the system can address supply gaps, evaluate facilities required to deliver imported water supply and evaluate policies and guidelines for infrastructure improvements.

6.4.18 Watershed Restoration Pilots

Watershed Restoration Pilots support Metropolitan's One Water approach and Bay-Delta Policies to improve water supply resilience in the face of climate change. Investigations will create opportunities for additional science, foster collaborative relationships in the upper watersheds, and establish a methodology for valuing ecosystem services.

6.4.19 Brackish Groundwater Desalination Study

The Brackish Groundwater Desalination Study will identify the potential for the development of additional potable water supplies through brackish groundwater desalination. The study will also assess the opportunity for integration in adjacent water distribution systems and regional water systems.

6.4.20 Seawater Desalination Study

The Seawater Desalination Study will identify the potential for the development of additional potable water supplies through seawater desalination. The study will also assess the opportunity for integration in adjacent water distribution systems and regional water systems.

6.4.21 Colorado River Aqueduct (CRA) Transmission Strategic Plan

Metropolitan's ownership and operation of the CRA and its power transmission system, including five pumping plant facilities along the CRA, is vital to Metropolitan's mission. The CRA Transmission Strategic Plan will provide recommendations for sustainably managing and improving the system for long-term reliability, affordability and resilience.

6.4.22 Energy Sustainability Plan Update

Metropolitan will update its 2020 Energy Sustainability Plan (ESP). The ESP's purpose is to facilitate informed energy management and investment decisions through consideration of energy cost containment, system reliability, affordability, environmental co-benefits and climate adaptation.

6.4.23 Diamond Valley Lake (DVL) Pumped Storage Expansion Study

Metropolitan will evaluate the potential expansion of the pumped storage program at Diamond Valley Lake to provide additional carbon-free energy to the system.

Appendix

Metropolitan Water District of Southern California CAMP4W Comprehensive Assessment

Metropolitan is committed to meeting its mission in the face of a changing climate by developing projects and programs that advance Time-Bound Targets, consistent with the Board's priorities. This comprehensive assessment is a key part of the Climate Decision-Making Framework and will be used to support Board deliberations on which projects and programs Metropolitan should pursue.

Project/Program/Portfolio at a Glance

Title of Project/Program/Portfolio

Status (planning/design/implementation) and Date

Capacity (if applicable)

Capital Cost Operation/Maintenance or Ongoing Cost

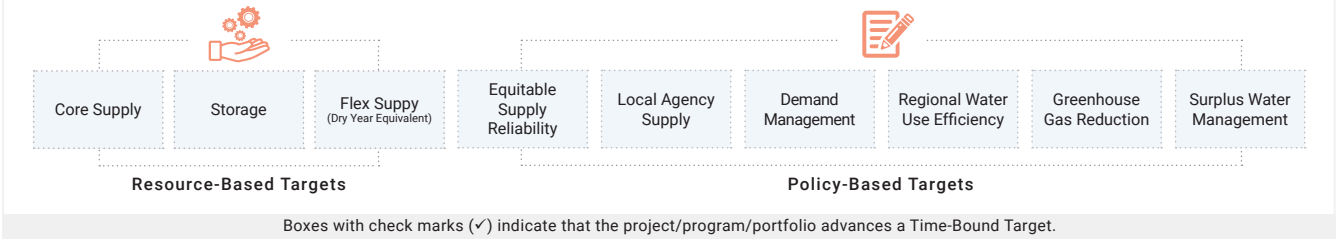
Description and how the project/program/portfolio supports water supplies, reliability and/or delivery

Portfolio view and additional potential companion projects/ programs/portfolios

Summary of Assessment and Staff Recommendation

Each criteria and attribute presented on the following pages includes a description of the quantitative and qualitative measures relevant to the proposed project or programs, as well as, Metropolitan staff's recommendation.

What Time-Bound Targets Does the Project/Program/Portfolio Address?



Boxes with check marks (✓) indicate that the project/program/portfolio advances a Time-Bound Target.

Summary of Assessment and Staff Recommendation *(see footnote on Page 2 for ranking guidelines)*

Reliability	Resilience	Financial Sustainability and Affordability	Adaptability and Flexibility	Equity	Environmental Co-Benefits

See the following pages for a detailed assessment across each Evaluative Criteria category.

Map or Location Information Related to the Project, Program or Portfolio

Project, Program or Portfolio Location Information

Footnote: Ranking Guidelines Overall

These **rankings** define which level a project, program or portfolio will deliver CAMP4W objectives overall.

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Reliability Supply Performance Equitable Reliability	1. To what extent does it help meet regional supply reliability objectives under changing climate conditions?		
	2. To what extent does it advance equitable supply reliability?		
	3. When will it be operational? What is the useful life of the project/program/portfolio? How will benefits continue beyond the 2045 planning horizon under changing climate conditions?		
	4. Are there additional projects/programs/ portfolios that could be added to improve this project/program/portfolio's effectiveness for water supply reliability?		
	5. How does this project/program/portfolio improve the water supply reliability of existing projects/programs/systems?		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

Ranking Guidelines at the Attribute Level

Defining to which level a project, program or portfolio will deliver CAMP4W objectives for each attribute category.

Exceptional	The project/program/portfolio directly and completely addresses the benefits being assessed by the question/statement.
Significant	The project/program/portfolio directly addresses most elements of the benefits being assessed by the question/statement.
Moderate	The project/program/portfolio only addresses some elements of the benefits being assessed by the question/statement or addresses them indirectly.
Limited	The project/program/portfolio only addresses few or minor elements of the benefits being assessed by the question/statement or provides minor indirect benefits.
Very Limited	The project/program/portfolio does not provide any or very limited benefits to those being assessed by the question/statement.
Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Overall Assessment

Overall Assessment Value

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Resilience Addresses known risks and vulnerabilities Project, Program or Portfolio's ability to perform under climate impacts	1. How does it perform under identified climate vulnerabilities and hazards (e.g., extreme heat, wildfire, sea level rise, flooding)? **Drought is addressed in Reliability*		
	2. How does it maintain system reliability, including delivery and water quality, under identified climate vulnerabilities and hazards (e.g., extreme heat, wildfire, sea level rise, flooding)? **Drought is addressed in Reliability*		
	3. Describe any resilience co-benefits (e.g., seismic) achieved through this project, program, or portfolio.		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

Overall Assessment

Overall Assessment Value

Ranking Guidelines at the Attribute Level

Defining to which level a project, program or portfolio will deliver CAMP4W objectives for each attribute category.

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Very Limited	The project/program/portfolio does not provide any or very limited benefits to those being assessed by the question/statement.
Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Financial Sustainability and Affordability Unit cost	1. What is the cost of the project?		
	2. What are the projected impacts to rates and budget?		
	3. If applicable, what is the unit cost/acre foot in current year dollars? For storage projects, what is the cost/capacity?		
	4. Does considering life cycle cost change the Financial Sustainability and Affordability?		
	5. Is it eligible for federal and/or state grants? If so, what are the estimated target amount(s)? Is there a local match requirement? If so, how much?		
	6. Does it have a revenue generation component that helps offset costs?		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

Overall Assessment

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Ranking Guidelines at the Attribute Level

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Very Limited	The project/program/portfolio does not provide any or very limited benefits to those being assessed by the question/statement.
Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Adaptability and Flexibility Flexibility of existing assets Ease / Complexity Scalability	1. Describe how it works with and/or improves the flexibility of existing assets, plans, policies or programs and how it improves the ability to adjust to systemwide changes (water quality, source water, distribution interruption).		
	2. Explain how complex the day-to-day operations might be (example: staffing, maintenance, preparation).		
	3. How can it be phased (i.e., near-term value of an initial phase; using phasing to manage existing uncertainty; using phasing to allow for adjustments in the project/program/ portfolio as new information is developed)?		
	4. What is the implementation risk and/or complexity of implementation?		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

Ranking Guidelines at the Attribute Level

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Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Overall Assessment

Overall Assessment Value

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Equity Programs for underserved communities Scale of community engagement Public health benefits Workforce development	1. What percentage of the area served by the project, program, or portfolio includes underserved communities and what percentage of the project/program/portfolio area is in underserved communities?		
	2. What specific community benefits are included in the project, program, or portfolio?		
	3. What level of community, tribal, and partner engagement is included in the project, program, or portfolio?		
	4. Describe the extent and reasons why there is broad community support/opposition or potential for support/opposition.		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

Ranking Guidelines at the Attribute Level

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Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Overall Assessment

Overall Assessment Value

Comprehensive Assessment by Evaluative Criteria

Assessment

Evaluative Criteria	Attributes	Assessment	Value
Environmental Co-Benefits Greenhouse gas emissions Benefits Ecosystem services Habitat/wildlife benefits	1. What are the estimated greenhouse gas emissions or enhanced carbon sequestration, and how does it impact the carbon budget, as defined by the Climate Action Plan?		
	2. In what way and to what degree does it provide additional ecosystem services?		
	3. To what extent does it protect, improve, or expand wildlife and fish habitat and/or affect flows in ways that improve ecological functions for native species?		

Additional Information

Please describe how the proposed project, program, or portfolio advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.	

Key: Exceptional | Significant | Moderate | Limited | Very Limited | Undetermined or Not Applicable

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Very Limited	The project/program/portfolio does not provide any or very limited benefits to those being assessed by the question/statement.
Undetermined or Not Applicable	The ranking for this project/program/portfolio is not determined at this time or the attribute is not applicable.

Overall Assessment

Overall Assessment Value

Supplemental Information

Description

CAMP4W Comprehensive Assessment Guidance Document

1. Objective and Use

The objective of this Guidance Document is to provide instructional support to Metropolitan staff completing CAMP4W Comprehensive Assessments for projects, programs, and portfolios that meet the threshold for evaluation within the CAMP4W Climate Decision-Making Framework. The assessments are based on the Evaluative Criteria developed by the CAMP4W Task Force and reflect the themes and priorities for Metropolitan moving forward to integrate climate adaptation priorities into investment decisions.

The **Evaluative Criteria** represent a defined set of criteria used to establish a value assessed for projects, programs, or portfolios to support the Board's decision-making process. The Evaluative Criteria are broken out into six components: reliability, resilience, financial sustainability and affordability, adaptability and flexibility, equity, and environmental co-benefits.

Each of the Evaluative Criteria include a series of questions to generate both quantitative and qualitative information from which the project, program, or portfolio can be assessed. Each question will receive a value (**Section 2**), which will assist the Board in deliberations. This process will facilitate understanding to which level a project, program, or portfolio advances Metropolitan's long-term reliability, measured by both the Evaluative Criteria and Time-Bound Targets.

An Evaluation Committee comprised of subject matter experts from various groups within Metropolitan will conduct the Comprehensive Assessments and provide the Board with the information described below to inform decision-making. Each Criteria has an assigned subject matter lead who is responsible for gathering relevant information to make their recommendations. Assignments may be adjusted on a case-by-case basis per the discretion of the Evaluation Committee. The Committee works together to complete the Summary Page, produce supporting materials, and refine the final Assessment. Additional staff subject matter experts can be included in deliberations when necessary, and staff will engage Member Agencies during the assessment process. Staff group leads are defined below:

- Reliability: Water Resources Management
- Resilience: Engineering Services
- Financial Sustainability & Affordability: Finance
- Adaptability & Flexibility: Water Supply Operations
- Equity: Diversity, Equity, and Inclusion & External Affairs
- Environmental Co-Benefits: Sustainability, Resilience, and Innovation

The Comprehensive Assessment is broken into seven sections. The first section, Project/ Program/ Portfolio at a Glance provides an overall assessment and staff recommendations. The following sections discuss how it directly relates to Metropolitan's Evaluative Criteria. **Table 8** presents the glossary of terms used in the assessment.

2. Ranking Guide

Key attributes of each of the evaluative criteria are given a value based on the criteria shown in Figures 1 and 2. The rankings define to which level a project, program or portfolio will deliver CAMP4W objectives. A score of **Exceptional** is attributed to a project, program, or portfolio that directly and completely addresses the benefits being assessed by the question or statement. Meanwhile, a score of **Very Limited** is attributed to a project, program, or portfolio that does not provide any or has very limited benefits to those being assessed by the question or statement. Where **Not Yet Determined/Not Applicable** is selected, this indicates that the project, program, or portfolio is still in development and the questions cannot be adequately addressed, or the criteria or attribute is not applicable.

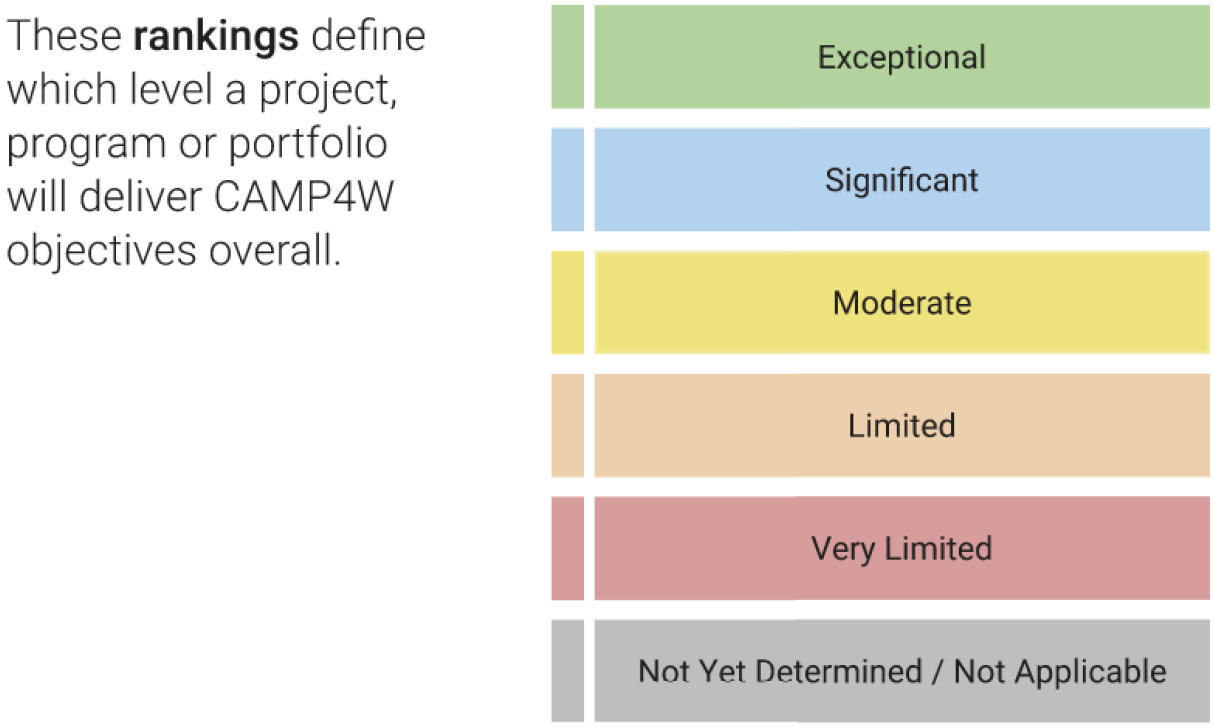


Figure 1: Ranking Guidelines at the Overall Level

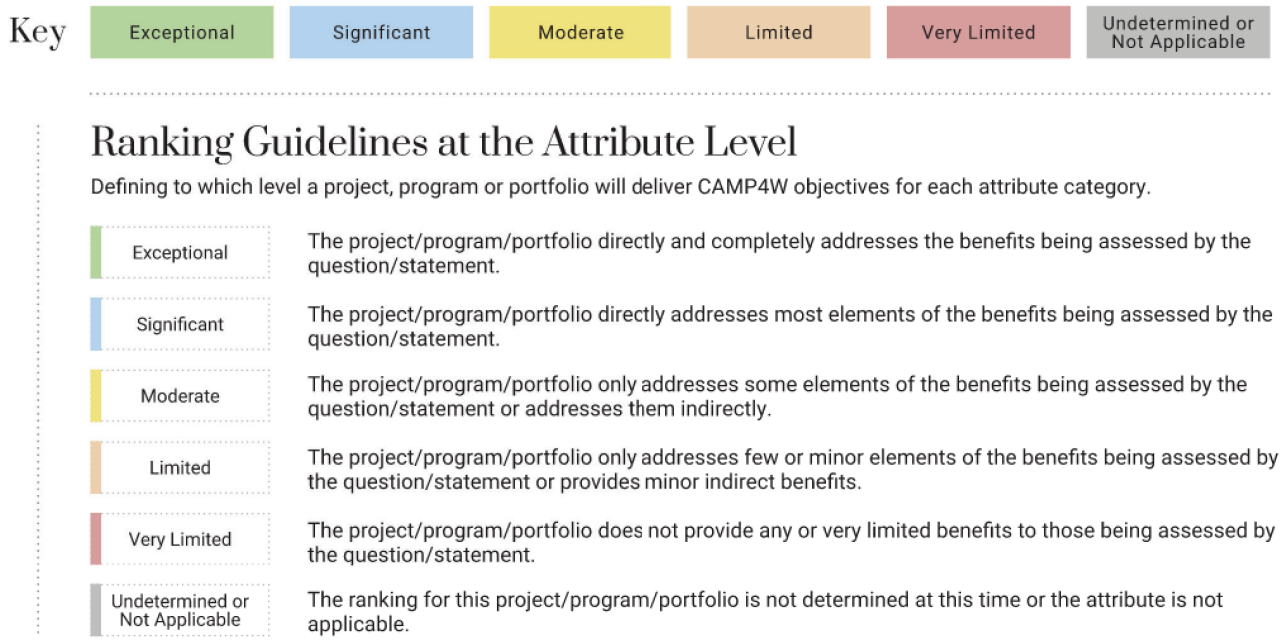


Figure 2: Ranking Guidelines at the Attribute Level

3. Project, Program, or Portfolio Location Map

A map of the project, program, or portfolio location should be included showing enough detail to illustrate the extent of the project, program, or portfolio, and show all relevant components to support Board discussions.

4. Guidance for each Evaluative Criteria

The following tables provide guidance for staff on how to complete the CAMP4W Comprehensive Assessment by providing further explanation of the intent of each question and recommendations on where to access supportive data and information.

4.1 Project/ Program/ Portfolio at a Glance

Table 1. At a Glance

Question or Title of Data Entry	Guidance
Title of Project/Program/Portfolio	Enter project/program/portfolio title.
Status and Date (planning/design/implementation)	Enter planning, design, or implementation based on status at the time the form is being prepared and provide date of assessment completion.
Capacity (if applicable)	Enter values such as acre-feet per year of core supply, acre-feet of storage, additional flex supply, cubic feet per second of conveyance capacity, megawatts and/or kilowatt hours provided.

Capital Cost	Enter the capital cost in current year dollars.
Operation/Maintenance or Ongoing Cost	Enter the operation and maintenance cost in current year dollars.
Description and how the project/program/portfolio supports water supplies, reliability and/or delivery	Explain the benefits of the project/program/portfolio as it relates to providing additional core/flex supply or storage, how it improves reliability within the system, or how it improves delivery. Include information on how it performs during wet and dry years and any restrictions (e.g., requires a new core supply to be effective in dry years, etc.). This description should be written for a general audience and without acronyms or terminology not widely understood. (i.e. instead of referencing specific IRP scenarios, describe as more severe climate conditions or stable or increased demands).
Portfolio view and additional potential companion projects/programs/portfolios	Explain how it functions when combined with other projects/programs/portfolios. May require modeling to assess how projects work together to provide benefits, or how benefits are lessened if other projects were to be implemented.
Summary of Assessment and Staff Recommendation	Summarize the comprehensive evaluation of the project/program/portfolio as it relates to the Evaluative Criteria and Time-Bound Targets. This description should focus on the most important benefits of the proposal, as well as significant limitations that need to be communicated. Avoid acronyms or terminology not widely understood and focus on how this proposal ensures the delivery of Metropolitan's core mission.

In addition to the questions posed above, the CAMP4W Comprehensive Assessment includes selection of which Time-Bound Targets the project, program, or portfolio addresses. The user will select all that apply.

The user will also select the assessment value assigned to each Evaluative Criteria. The assessment value presented as part of the summary will align with the value provided on each individual Evaluative Criteria page, as discussed in the following sections.

4.2 Reliability Attributes

Table 2 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Reliability Evaluative Criteria. This section is only relevant to water supply reliability projects, programs and/or portfolios. Energy projects, for example, will only be evaluated using the other five criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- Integrated Resources Plan Simulation Model (IRPSIM)
- Historical drought sequence data
- Qualitative description of reliability attributes and/or limitations

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in **Section 2**.

Table 2. Reliability Attributes

Question or Title of Data Entry	Guidance
1. To what extent does it help meet regional supply reliability objectives under changing climate conditions?	If applicable, summarize how it performs using IRPSIM and historical drought sequencing data. Indicate how it performs under multiple scenarios, including Scenarios C and D; include A and B analysis if relevant. This should be described quantitatively based on the projected reduction in future water supply shortages.
2. To what extent does it advance equitable supply reliability?	Indicate how it supports areas within the service area experiencing supply inequity, namely the State Water Project Dependent Areas. Utilize IRPSIM and historical drought sequencing to support the analysis and indicate how it performs under multiple scenarios, including Scenarios C and D; include A and B analysis if relevant.
3. When will it be operational? What is the useful life of the project/program? How will benefits continue beyond the 2045 planning horizon under changing climate conditions?	Based on the most recent estimate at the time, indicate when it will be online and how that relates to the current planning horizon. Indicate how it will continue to perform beyond the current planning horizon (e.g., benefits beyond 2045).
4. Are there additional projects/programs/portfolios that could be	Where companion projects or programs will improve its performance and benefits, list either

added to improve this project/program/portfolio's effectiveness for water supply reliability?	specific projects, programs, or portfolios or categories of projects, programs, or portfolios that would be beneficial. Indicate if a companion project or program would be required or optional.
5. How does this project/program/portfolio improve the water supply reliability of existing projects/programs/systems?	Indicate how existing supply sources and facilities integrate with the project, program, or portfolio and how it will improve their utilization (e.g., perhaps a reservoir will utilize an existing pipeline that would otherwise be underutilized, or perhaps a new conveyance line would better distribute an existing supply).
Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies, and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

4.3 Resilience Attributes

Table 3 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Resilience Evaluative Criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- Consider link to existing planning processes including system reliability, vulnerability, and flexibility assessments
- Consider industry infrastructure standards for climate resilience and water quality
- Consider Federal and State drinking water standards and total dissolved solids reductions
- Qualitative description of resilience attributes and/or limitations

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in **Section 2**.

Table 3. Resilience Attributes

Question or Title of Data Entry	Guidance
1. How does it perform under identified climate vulnerabilities and hazards (e.g., extreme heat, wildfire, sea level rise, flooding)? *Drought is addressed in Reliability	This question is focused on the individual project, program, or portfolio level. Discuss how the project, program, or portfolio itself can withstand climate impacts (e.g., how resilient it is in the face of climate extremes). Reference here any existing vulnerability assessment that may be relevant. This should focus on climate impacts beyond drought to understand how durable the project, program, or portfolio is and what threats it may face.
2. How does it maintain system reliability, including delivery and water quality, under identified climate vulnerabilities and hazards (e.g., extreme heat, wildfire, sea level rise, flooding)? *Drought is addressed in Reliability	This question is focused on the system level. Discuss how the project, program, or portfolio will help Metropolitan's system as a whole to be more resilient to climate impacts beyond drought (e.g., how will it help Metropolitan face climate extremes).
3. Describe any resilience co-benefits (e.g., seismic) achieved through this project, program, or portfolio.	Explain how it can also strengthen Metropolitan's system in the face of other risks such as seismic risks. Also indicate if the project, program, or portfolio is itself resilient to those risks.
Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies, and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

4.4 Financial Sustainability and Affordability Attributes

Table 4 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Financial Sustainability and Affordability Evaluative Criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- Project Costs (capital, O&M, life cycle, net present value)
- Qualitative description of potential funding opportunities and/or project partners

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in **Section 2**.

Table 4. Financial Sustainability and Affordability Attributes

Question or Title of Data Entry	Guidance
1. What is the cost impact?	Provide overall cost in current year dollars and anticipated financing plan, if applicable.
2. What are the projected impacts to rate and budget?	Provide the overall cost impact (%) and the average annual cost increase (% over X years).
3. If applicable, what is the unit cost/acre foot in current year dollars? For storage projects, what is the cost/capacity?	For supply projects, provide the cost/acre foot to bring water to Metropolitan's service area. Point-in-time unit cost: Assumes all debt issued in year one and full operation in year one. Lifecycle unit cost: Average unit cost over project life. Includes replacements and refurbishments costs. For storage projects, provide the cost/capacity. For other projects, programs, or portfolios, provide any relevant unit costs.
4. Does considering life cycle cost change the Financial Sustainability and Affordability?	Explain potential life cycle costs of the project, program, or portfolio and how its value changes over time and what impact that may have to rates or other metrics.
4. Is it eligible for federal and/or state grants or other funding sources? If so, what are the estimated target amount(s)? Is there a local match requirement? If so, how much?	Provide an explanation of any federal and/or state grants to Metropolitan including details about any matching requirements. Be clear about which are certain/expected, and which are potential/speculative.
5. Does it have a revenue generation component that helps offset costs?	Provide details of any opportunities for the project, program, or portfolio to have a revenue generation component. Be clear about which are certain/expected, and which are potential/speculative.

Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies, and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

4.5 Adaptability and Flexibility Attributes

Table 5 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Adaptability and Flexibility Evaluative Criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- Quantitative and qualitative description of potential added system operational flexibility (redundancy, water quality, etc.) and implementation complexity and risks (ROW, timing, partners, etc.)
- Quantitative and qualitative description of scalability (cost, benefits, impacts)
- Qualitative description of impact on day-to-day operations
- Ability to adapt to uncertainties and sustain a specified performance across changing conditions (e.g., demand, legislation, energy costs)

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in **Section 2**.

Table 5. Adaptability and Flexibility Attributes

Question or Title of Data Entry	Guidance
1. Describe how it works with and/or improves the flexibility of existing assets, plans, policies or programs and how it improves the ability to adjust to systemwide changes (water quality, source water, distribution interruption).	Describe how it works with and/or improves the flexibility of existing assets, plans, policies or programs and how it improves the ability to adjust to systemwide changes (water quality, source water, distribution interruption). Include any areas where it reduces the flexibility of existing assets, plans, policies, or programs.

	This should be focused on operational considerations.
2. Explain how complex the day-to-day operations might be (example: staffing, maintenance, preparation).	Describe how it works and how it will be staffed by Metropolitan. Will there be a need for additional staff or training of existing staff? What is the long-term maintenance need of the project or program/?
3. How can it be phased (i.e., near-term value of an initial phase; using phasing to manage existing uncertainty; using phasing to allow for adjustments in the project/program/portfolio as new information is developed)?	Describe if it can be phased to either reduce the initial cost or to allow for flexibility in timing? Is there a benefit of implementing it all at once, or does approaching it in a modular way allow for future adjustments based on changing conditions and/or needs?
4. What is the implementation risk and/or complexity of implementation?	Describe any risks or challenges associated with implementing the project, program, or portfolio, specifically those that could prevent or significantly delay implementation. Are there permits required, if so, are they complicated or difficult to obtain? Are there risks/complications associated with construction? Are there risks if the project, program, or portfolio is delayed?
Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

4.6 Equity Attributes

Table 6 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Equity Evaluative Criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- The latest CalEnviroScreen scores and percentiles in project area
- Percent of project, program, or portfolio area considered a Disadvantaged Community (CA Water Code 79505.5)
- Qualitative description of level of community, tribal and partner engagement
- Qualitative description of direct community benefits associated with project/program
- Consider using tool to measure/monetize co-benefits, where appropriate
- Scope of Community Benefits Program proposed

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in **Section 2**. Projects in underserved communities are not inherently positive or negative but depend on how they are executed. Moderate values indicate that the project, program, or portfolio does not exacerbate existing community inequities. Projects addressing the needs of underserved communities score higher under these metrics.

Table 6. Equity Attributes

Question or Title of Data Entry	Guidance
1. What percentage of the area served by the project, program or portfolio includes underserved communities and what percentage of the project/program/portfolio area is in underserved communities?	This is a quantitative assessment. Provide specific CalEnviroScreen and Water Code §79505.5 references. Include information related to area served by the project, program, or portfolio. Assigned values for this attribute should be measured relative and proportional to the total percentage of underserved communities in Metropolitan's service area (~40% in 2024).
2. What specific community benefits are included in the project, program, or portfolio?	Explain the benefits of the project/program/portfolio as it relates to local communities that are impacted by it. Benefits may include workforce opportunities, water quality improvements, urban greening, localized resilience, public health, opportunities for small businesses/disadvantaged business enterprises (DBEs), etc. Provide details of the Community Benefits Program proposed, where applicable. Discuss benefits other than water supply; water supply benefits should be covered in the Reliability section. Also describe any anticipated disruption or harm to underserved communities.

3. What level of community, tribal, and partner engagement is included in the project, program, or portfolio?	Explain the level of community, tribal, and partner engagement that is included in the project, program, or portfolio. Be clear about the difference between past or ongoing engagement and planned or intended engagement.
4. Describe the extent and reasons why there is broad community support/opposition or potential for support/opposition.	Provide additional information on the extent of support or opposition and any reasons why those factors exist, and if there are any ways to mitigate opposition and/or increase support.
Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies, and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

4.7 Environmental Co-Benefits Attributes

Table 7 provides an overall summary of the project, program, or portfolio information and staff assessment results related to the Environmental Co-Benefits Evaluative Criteria.

It is important that assessment information is consistent to the extent possible across the various projects/programs/portfolios being assessed as part of the CAMP4W Climate Decision-Making Framework. The following sources of information should be used to support this Evaluative Criteria to ensure the assessment is comprehensive.

- GHG and pollutant load estimates
- Qualitative description of ecosystem services and functions provided
- Consider using tool to measure/monetize co-benefits, where appropriate
- Acreage of land impacted; Acre-feet of water provided to ecosystem benefits; or other such metrics

In addition to responding to each question, the user will select a value to assign to each question as well as an overall value for this Evaluative Criteria based on the key provided in S**ection 2**.

Table 7. Environmental Co-Benefits Attributes

Question or Title of Data Entry	Guidance
1. What are the estimated greenhouse gas emissions or enhanced carbon sequestration, and how does it impact the carbon budget, as defined by the Climate Action Plan?	Provide quantitative information related to the estimated greenhouse gas emissions for the project, program, or portfolio. If applicable, compare to existing project/program/portfolio emissions and describe how it is or is not consistent with assumptions in the 2045 carbon budget. Include any proposed mitigation to reduce or offset estimated emissions, including the potential for carbon sequestration.
2. In what way and to what degree does it provide additional ecosystem services?	Detail any way and to what degree it provides additional ecosystem services, such as benefits to watershed health, forest or natural land management, pollution reduction, or agricultural sustainability (species and habitat benefits are discussed in question #3 below). Where appropriate, describe how those improvements may support water supply, water quality or other functions important to the Metropolitan mission. Are there negative impacts that may be challenging to mitigate?
3. To what extent does it protect, improve, or expand wildlife and fish habitat and/or affect flows in ways that improve ecological functions for native species?	Provide information related to potential benefits to species, habitat, or ecological functions. Does the project, program, or portfolio contain any elements that improve ecological functions for native species? Where appropriate, describe how those improvements may support water supply, water quality or other functions important to the Metropolitan mission. Are there negative impacts that may be challenging to mitigate?
Additional Information	Utilize this space to further expand on the analysis with any important considerations not covered above and to discuss how it advances the CAMP4W Time-Bound Targets, develops new or improves existing partnerships or collaborations, and builds on existing plans, policies and initiatives at Metropolitan.
Overall Assessment	Provide a summary of the overall assessment for this Evaluative Criteria based on the previous questions. Explain if certain attributes were considered more significant than others in the recommended overall value determination.

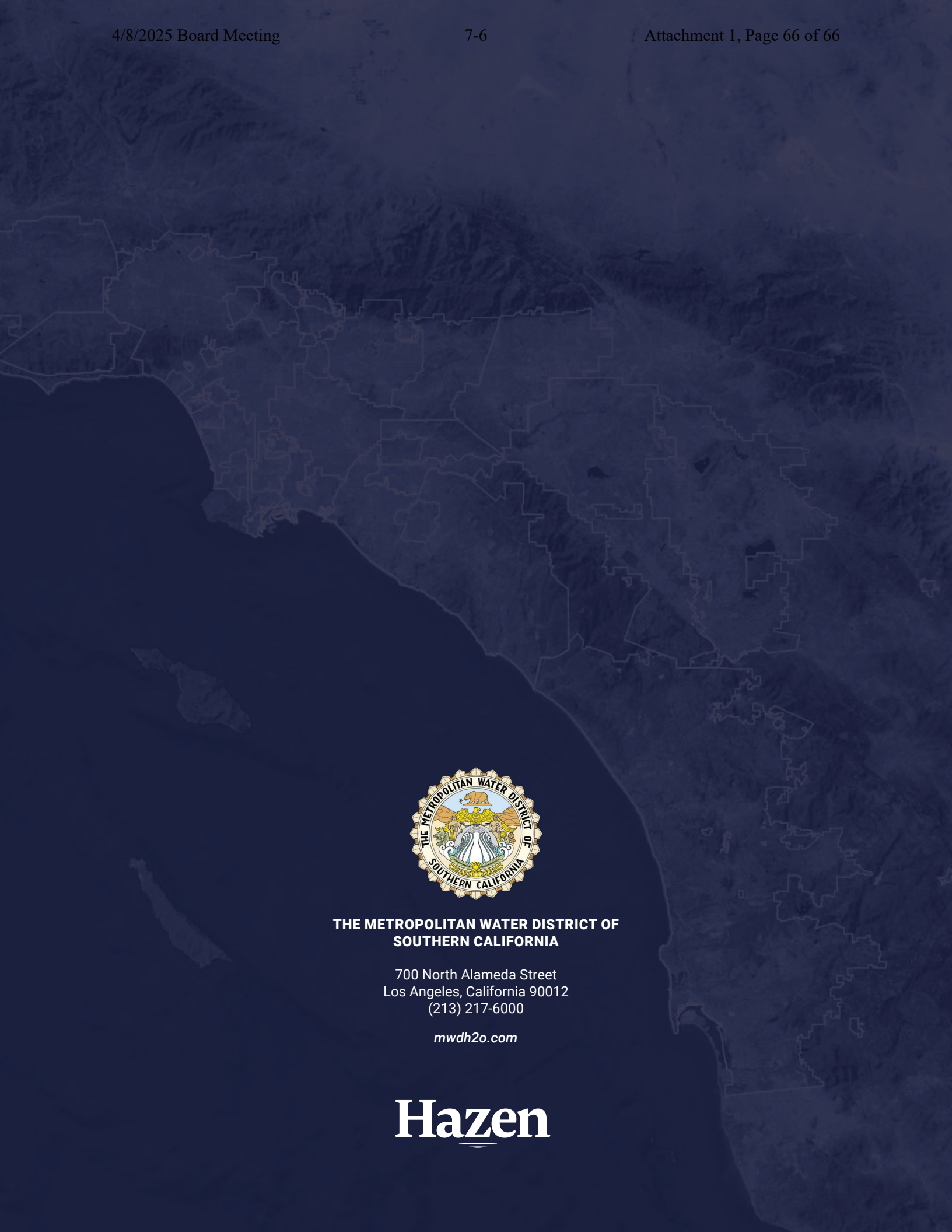
Table 8. CAMP4W Glossary of Terms

Term	Definition
Adaptability and Flexibility	Considers how a project, program, or portfolio 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.
Adaptive Management	A process that encourages the use of new information to respond to changing conditions. Allows Metropolitan to plan for rapid change and adjust based on current real-world conditions
Affordability	Relative cost burden and elastic ability to access (pay for) service and support member agency efforts to provide affordable supply to their customers
AFY	Acre-Feet per Year
CalEnviro Screen	CalEnviroScreen 4.0 is a methodology to identify communities disproportionately burdened by pollution provided by the California Office of Environmental Health Hazard Assessment (OEHHA)
CAMP4W	Climate Adaptation Master Plan for Water
CAP	Climate Action Plan
Capacity	Refers to the project/program/portfolio design parameters, which may include the acre-feet per year, cubic feet per second, megawatts, or other metric depending on the type of project.
CFS	Cubic Feet per Second
Climate Decision-Making Framework	The process by which Metropolitan assesses investment decisions through a methodical, data driven manner while accounting for climate risks and vulnerabilities, Board preferences and financial implications. Builds in the process for adaptively making decisions over time based on evolving conditions
Climate Vulnerability Assessments	Assessments developed to identify infrastructure that is most vulnerable to climate change
Co-Benefits	Benefits the extend beyond the primary purpose of the project/program/portfolio.
Community Benefits Program	Program to identify, fund, and implement local projects that can provide tangible, lasting, and valuable economic and social benefits to the residents, businesses, and organizations impacted by construction and operation of the project.

Companion Projects	Projects that support the project/program/portfolio being assessed, which without the companion project would not be able to function within Metropolitan's system due to connectivity, supply source, power supply, or other, but which have not been combined to form a portfolio for assessment purposes (for example, if a project has multiple potential companion projects to consider).
Core Supply	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.
CRA	Colorado River Aqueduct
Demand Management	Managing long-term demands through the efficient use of water
Disadvantaged Community	Defined in California in Water Code 79505.5 as a community with an annual mean household income (MHI) that is less than 80 percent of the statewide MHI, and a severely disadvantaged community is defined by an MHI below 60 percent of the statewide MHI.
Drought Mitigation Projects	Projects identified to improve Metropolitan's response to drought in response to the vulnerability experienced in the State Water Project Dependent Areas during the 2020-2022 drought.
Ecosystem Services	Direct and indirect benefits that ecosystems provide humans including, but limited to, drinking water, air quality, flood protection, food, recreation, tourism, and carbon sequestration.
Ecological Functions	Natural processes and interactions within an ecosystem, supporting life and maintaining environmental balance. This includes processes like nutrient cycling, pollination, and habitat formation, which are critical for sustaining biodiversity and ecosystem health.
Environmental Co-Benefits	Measures greenhouse gas emissions, ecosystem services, and benefits to habitat and wildlife
Equitable Supply Reliability	All member agencies receive equivalent water supply reliability through an interconnected and robust system of supplies, storage, and programs.
Equity	Fair, just, and inclusive
Evaluative Criteria	Metrics used to assess and rank projects/programs/portfolios; a defined set of criteria used to establish a value for projects, programs, and portfolios 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.
Financial Plan	Metropolitan's current financial circumstances and its long-term and short-term goals

Flex 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.
Financial Sustainability	Revenues sufficient to cover expenses over the short- and long-term.
GHG	Greenhouse Gas Emissions
IRP	Integrated Water Resources Plan
IRPSIM	IRPSIM is a water supply and demand mass balance simulation model, which analyzes the supply-demand gaps.
Life cycle cost	Cost over the expected life of the project/program/portfolio inclusive of capital and operations and maintenance costs and escalation factors.
Local Agency Supply	Member Agency supplies
LRFP	Long-Range Financial Plan
Member Agency Projects	Projects led by Member Agencies that are brought to the Metropolitan Board for funding consideration
MW	Megawatt
O&M	Operation and Maintenance
Operational	Refers to the time period when the project/program/portfolio will be online and fully functioning as intended.
Phased	Refers to a project/program/portfolio's ability to be implemented in phases, which may indicate increased flexibility during the adaptive management process.
Planning Horizon	Refers to the year in which Metropolitan is currently planning towards (e.g., 2045 based on the 2020 IRP Needs Assessment).
Portfolio	A subset of projects/programs that would be implemented together.
Project Lists	A compilation of projects that will be analyzed through the CAMP4W process
R & R	Refurbishment and replacement. Refers to projects that are required to maintain Metropolitan's existing infrastructure but does not refer to additional capital projects needed to address a specific vulnerability (climate or earthquake) beyond typical system maintenance
Regional Water Use Efficiency	Refers to Metropolitan’s efforts to assist Retail Agencies with achieving, or exceeding, compliance with the State Water Resources Control Board Water Use Efficiency Standards
Reliability	Ability to always meet water demands.

Resilience projects	Capital projects that increase resilience of existing infrastructure beyond what would be included in a typical R&R project
Resilience	Ability to withstand and recover from disruptions
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.
Source Information	Refers to the source of data or analysis process that should be used to support the assessment to provide a uniform evaluation process across projects and programs.
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.
Surplus Water Management	Management of excess water available beyond current demands that is stored for future and anticipated periods of need.
SWP	State Water Project
SWPDA	State Water Project Dependent Area
System Assessment	Documentation of Metropolitan's current system and policies
TAF	Thousand-Acre-Feet
Task Force for CAMP4W	A group made up of a select list of Metropolitan Board Members, Member Agency Managers, and Metropolitan staff tasked with guiding the CAMP4W process
Themes	A series of Board identified priorities developed during the early phases to represent the values of the CAMP4W planning process. The Themes inform the development of the Evaluative Criteria so that the assessment of projects/programs/portfolios reflects these Themes and therefore the Board preferences.
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.
Vulnerability Assessment Recommendations	Recommendations for infrastructure needed to harden the existing system in the face of climate change and other hazards the region face
Working Memoranda	Documentation of the CAMP4W process that will form the basis for the Master Plan.



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