Water Resilience Challenges and Opportunities

May 20, 2025

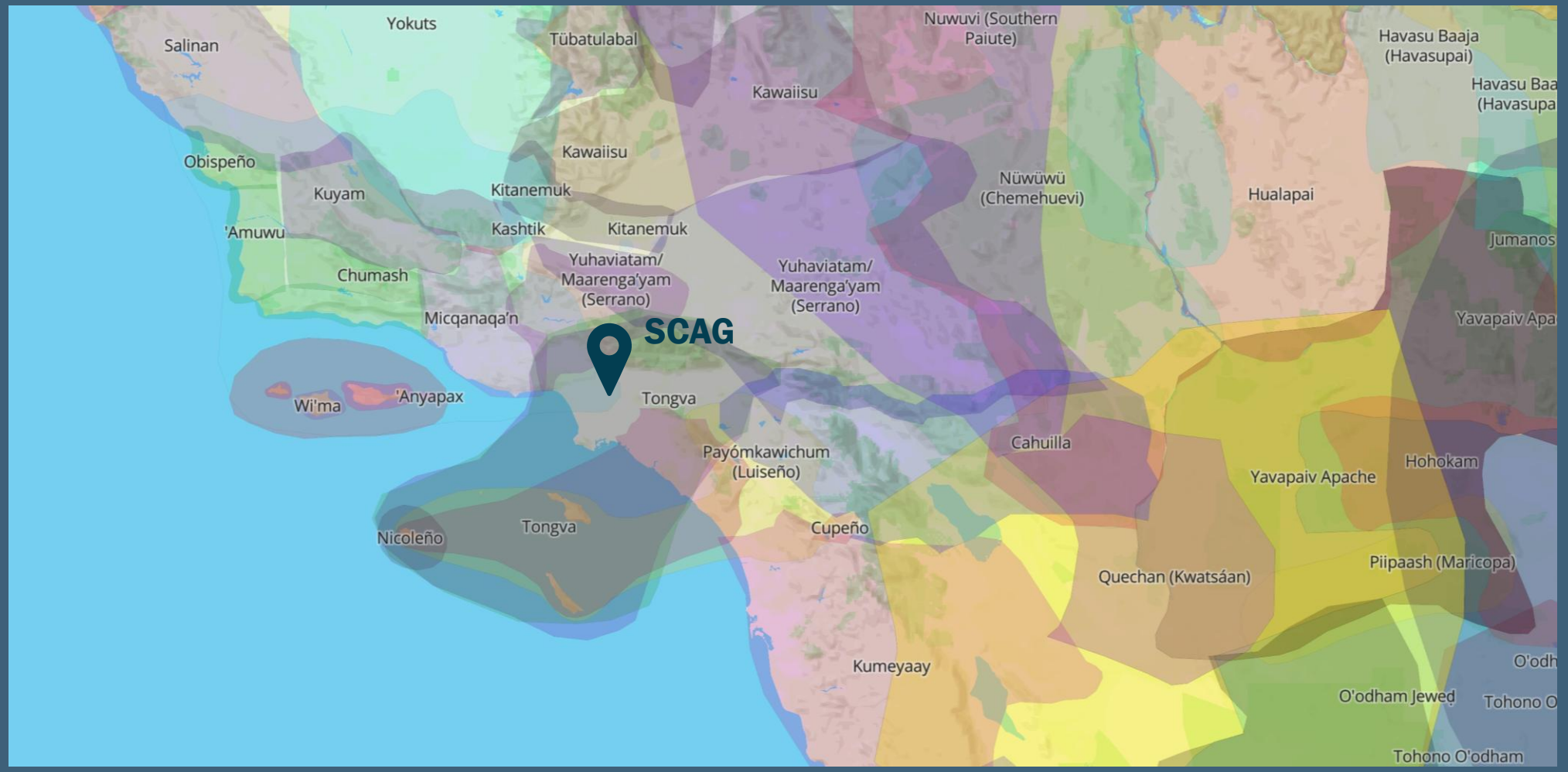
Toolbox Tuesday

WWW.SCAG.CA.GOV

Housekeeping

1. Meeting length: 1.5 hour
2. This meeting is being recorded
3. All participant lines will be muted
4. At the end, there will be a Q&A session
5. If you have a question, please type it into the chat box
6. We will log all questions and then voice a selection at the end of the session
7. Closed captioning can be turned on by clicking “Show captions” on the Zoom ribbon
8. A recording of this webinar and the PowerPoint slides will be available on the SCAG website. We will send a link to everyone who has registered after the event
9. Please fill out our survey at the end to help us improve future Toolbox Tuesdays!

Land Acknowledgement



Agenda

- SCAG Water Action Resolution White Paper
  - Charlotte Will, Estolano Advisors
  - Stephanie Zinn, Geosyntec Consultants
- Los Angeles County Public Works
  - Lee Alexanderson, PE, ENV SP, Senior Civil Engineer
- Metropolitan Water District
  - Liz Crosson, Chief Sustainability, Resilience and Innovation Officer
- Western Municipal Water District
  - Ryan Shaw, Director of Water Resources
- Discussion Panel
  - Cecilia Estolano, Estolano Advisors

Water Resolution White Paper:
Regional Findings

May 2025

WWW.SCAG.CA.GOV

Agenda

1 Project Context

2 Water Resilience Challenges and Opportunities

3 Conclusion & Next Steps

PROJECT CONTEXT

Regional Context

- By 2050, an additional 2 million people are projected to live in the SCAG region (as compared to 2019). The region is also anticipating major growth in water-intensive industries.
- Water agencies are grappling with issues related to water reliability, quality, affordability, accessibility, and resilience and need funding to address them.
- To keep pace with growth projections and address these challenges, housing agencies, land use planners, and water managers will need to coordinate.

Project Components

Stakeholder Interviews

- 17 interviews (22 stakeholders)
- Interviewees represented a state agency, a groundwater management agency, water districts, a regional conservation district, flood control districts, and community based-organizations (CBOs)
- Focused on major water management challenges and promising strategies to address them

Water Data Landscape Analysis

- Included desktop research, geospatial analysis, and stakeholder interviews
- Reviewed availability, quality, and consistency of water management data
- Focused analysis on water equity indicators: reliable, clean and safe, affordable, accessible, and resilient

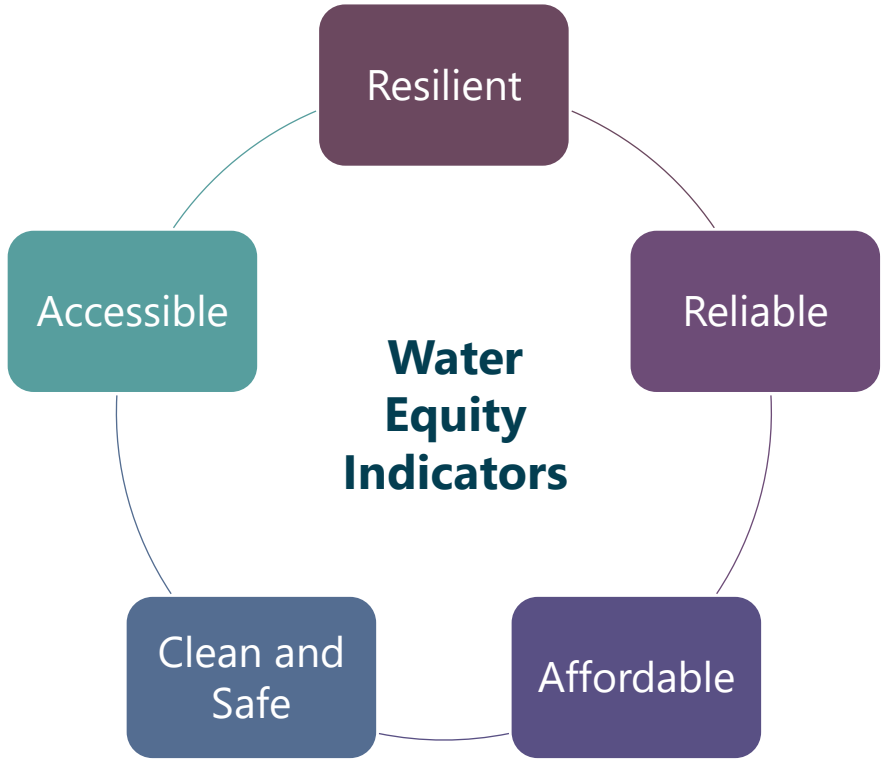
Network Mapping

- Mapped key actors involved in water management in each county:
  - Federal, state, and local regulatory bodies
  - Public, private, and mutual water companies, including wholesalers and retailers
- Mapped each entity's function and contractual/regulatory relationships

REGIONAL WATER RESILIENCE CHALLENGES AND OPPORTUNITIES

Five Indicators for Water Equity

- **Reliable** – the number of water sources and the reliability of each source.
- **Clean and Safe** – the quality of water for purposes such as human consumption, cooking, and sanitation.
- **Affordable** – the portion of household median income allocated to paying for water.
- **Accessible** – the presence and condition of water conveyance infrastructure.
- **Resilient** – the ability for a community or water source to "bounce back" from climate change impacts like droughts, floods, and sea level rise.



Regional Themes: **Reliable**

Takeaways

- **Projected increased demand** from industrial, commercial, and residential growth may strain limited water supplies.
- Pressure to **diversify water supplies** to respond to climate change and to meet demand.
- Extreme wet and dry periods due to climate change amplify the **need for more water storage.**

Promising Strategies

- Coordinated efforts between public agencies
- Local water supply diversification projects
- Tribal ecological practices
- Sustainable groundwater management

Data Gaps/Tools: **Reliable**

Takeaways

- May be a **gap between how water demand and population projections** are calculated.
- No region-wide summary of the **number and type of water supplies** each water purveyor uses exists.
- Limited data on **groundwater levels** for basins outside of the Sustainable Groundwater Management Act (SGMA) requirements.

Key Datasets/Tools

- Department of Water Resources (DWR) State Water Project Delivery Capability Report
- DWR Agricultural Land & Water Use Estimates
- Urban Water Management Plans
- CalMatters 2025 California Water Tracker
- Groundwater Sustainability Plans

Regional Themes: **Clean and Safe**

Takeaways

- **Aging infrastructure** can impact water quality at the tap.
- **Industrial and agricultural runoff** can contaminate groundwater and surface water sources.
- **Coordination between planning agencies and water managers** is critical to address the impacts of runoff on local watersheds and communities.
- Areas not covered by a water district typically rely on **private wells that have unknown water quality conditions**.

Promising Strategies

Emerging contaminant treatment technologies

Community-led education and research initiatives

Nature-based solutions for improved watershed health

Data Gaps/Challenges: **Clean and Safe**

Takeaways

- Limited data on water quality for **small water systems and domestic wells**
- Limited data on **emerging contaminants** (e.g., PFAS), but is expected to increase.
- Data on **groundwater quality** may be inconsistent, outdated, and inaccessible.
- No data on the **frequency or locations of the delivery of hauled or bottled water due to poor quality of tap water**.

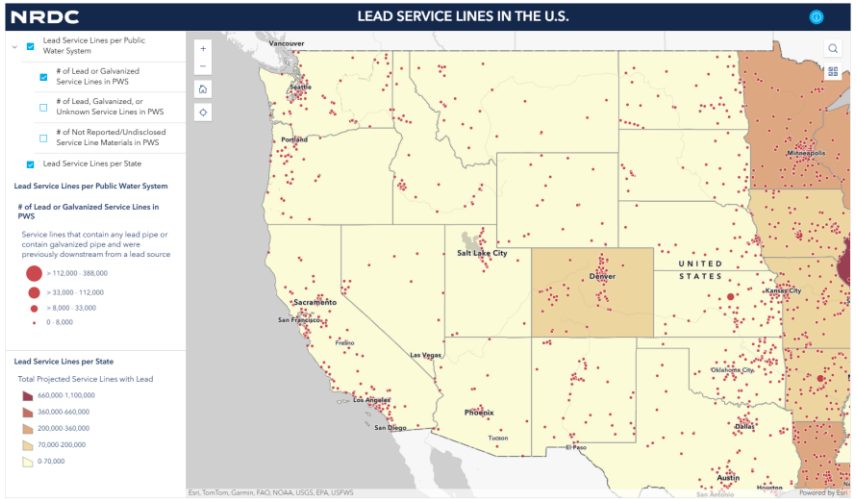
Key Datasets/Tools

SWRCB Safe and Affordable Funding for Equity and Resilience (SAFER) Program Dashboard

SWRCB Risk Assessment Dashboard Small Water Systems Domestic Wells

SWRCB's GeoTracker

NRDC/EPA Lead Pipe Interactive Map



Regional Themes: **Affordable**

Takeaways

- Some water districts are increasing rates to meet the **rising costs of water management**.
- Low-income communities across the region **struggle to afford these rate increases**.
- Increases in water rates have **unknown impacts on agricultural producers** in the region.

Promising Strategies

Water rate structures that promote water conservation and affordability

Agricultural crop swap programs for high value, low water use crops

Data Gaps/Challenges: **Affordable**

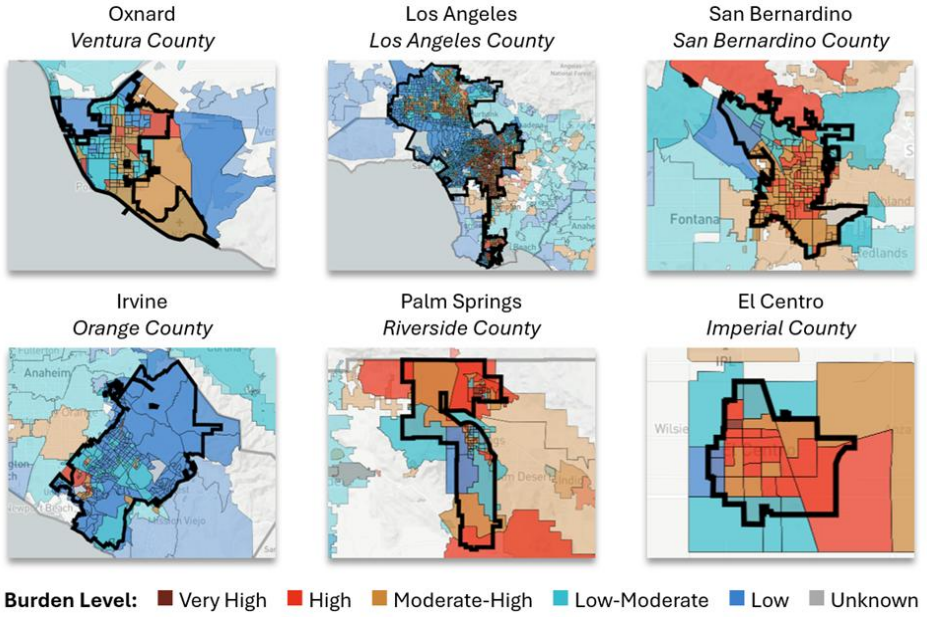
Takeaways

- **Costs of hauled or bottled water** for small and/or rural communities is unknown.
- Data on **costs for operation, maintenance, and repair of private wells** is not reported.
- Limited data on **agricultural water rates and their affordability**.
- Limited data on the **economic costs and benefits of agricultural water conservation**.

Key Datasets/Tools

Duke Nicholas Institute Water Affordability Dashboard

SWRCB SAFER Drinking Water Needs Assessment – Affordability Assessment



Regional Themes: **Accessible**

Takeaways

- **More funding is needed** to cover the costs of necessary infrastructure upgrades.
- **New infrastructure to provide reliable water access** is needed in some rural parts of the region.
- **Limited capacity to pursue diverse funding** for infrastructure improvements at the agency level, particularly for small water systems.

Promising Strategies

Cross-sector infrastructure planning

Increased infrastructure funding (BRIC, Prop 1)

Data Gaps/Challenges: **Accessible**

Takeaways

- Data gaps on the **location and condition of water conveyance infrastructure** throughout the region.
- **Not all water agencies have water master plans** documenting age, material, and condition of conveyance infrastructure.
- No public data on **historical water main breaks** or gaps in service.

Key Datasets/Tools

Local Water Master Plans

Digital Twin of Water Infrastructure for improved management

Regional Themes: **Resilient**

Takeaways

- **Agencies are pursuing adaptive and resilient solutions** to climate and natural hazards.
- **Drought, sea level rise, extreme flooding, wildfires, and earthquakes** are all threats to water resiliency in the SCAG region.
- **Increased cross-agency partnerships are needed** to implement promising programs and projects, that will support each other during interruptions.

Promising Strategies

Resilience and emergency planning

Climate Adaptation Funding and Plan Development

Data Gaps/Challenges: **Resilient**

Takeaways

- No known comprehensive dataset **compares or overlays water infrastructure data with climate hazard datasets** (i.e., data on sea level rise, flooding, wildfire risks).
- Jurisdictions need **support with applying climate models** to their local planning context.

Key Datasets/Tools

- Local Water Shortage Contingency Plans
- Local Hazard Mitigation Plans
- Sea Level Rise Interactive Maps
- Wildfire Risk Maps
- FEMA Flood Maps
- CalAdapt

CONCLUSION AND NEXT STEPS

Key Conclusions

- **More coordination is needed between planning agencies and water managers** to align land use and development planning with water management considerations.
- **More funding is needed** to plan and invest in water conveyance and flood control infrastructure upgrades, improve the region's resilience to climate change, and support growth.
- While watersheds span county, city, and water district boundaries, **many water management-related datasets are not available or consistent** across the region.
- Member agencies and water districts could use **support with utilizing state or regional datasets** to promote more accurate water supply and demand projections.

Next Steps

- SCAG will use the findings from this work to identify strategies to support its member jurisdictions with advancing sustainable infrastructure needs in the region.

Contact us with any questions or comments:
Kim Clark,
Sustainable & Resilient Development Dept,
Clark@scag.ca.gov


LA COUNTY
WATER PLAN

collaboration regional sustainability equity resources opportunity local relationships resilience water

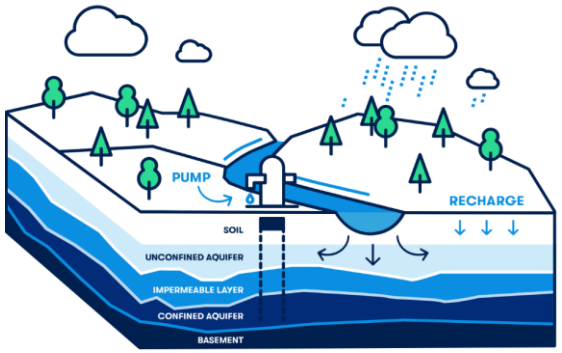
Where **does** our water come from?

LA COUNTY WATER PLAN

Imported Water Sources (60%)

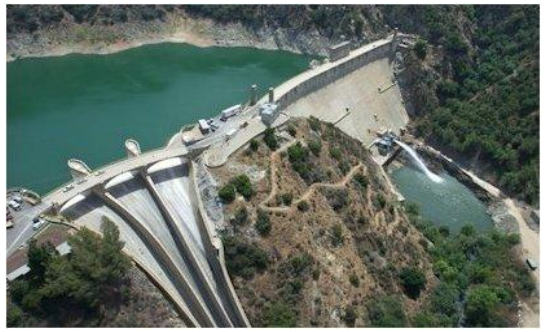
Local Water Sources (40%)

Groundwater



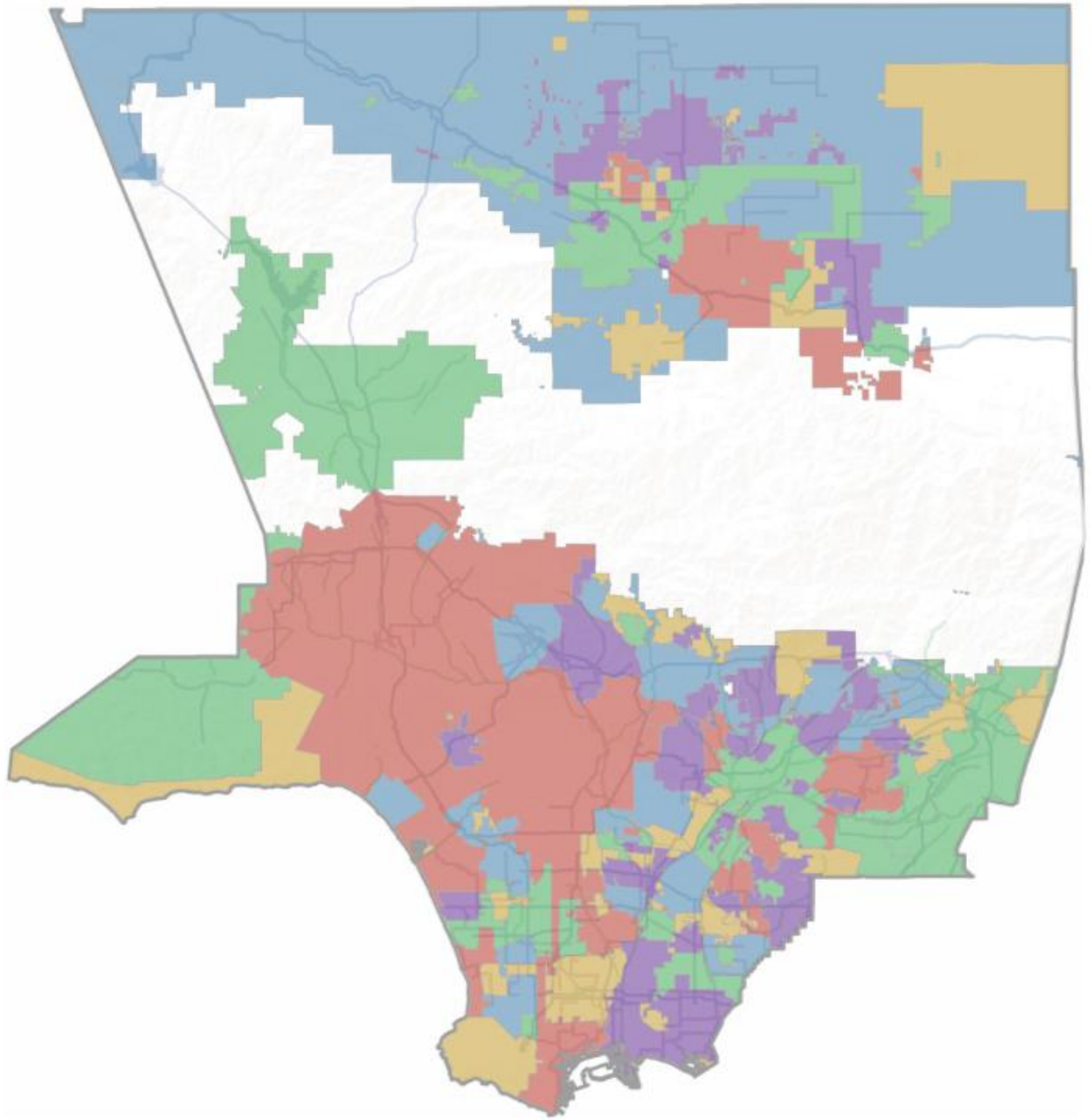
Recycled Water

Stormwater Capture



Governance

- **More than 200 drinking water supply entities operate within LA County**



County Water Plan Development

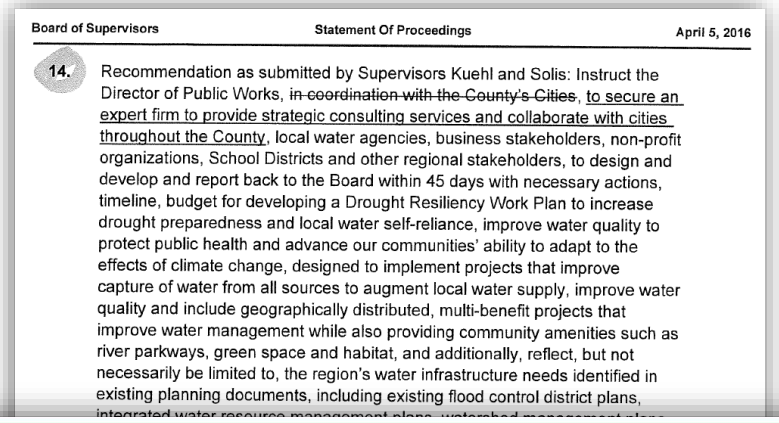
LA COUNTY WATER PLAN

How did the CWP come to be?

- **2016:** Drought Resiliency Work Plan & Water Resilience Initiative Board Motion
- **2018:** CSO's OurCounty Sustainability Plan Adoption
- **2019:** OurCounty Action 35 – LA County Water Plan

Action 35: Develop a local water supply plan.

Horizon	Short-to-Medium Term
Sphere of influence	Direct, Indirect
Lead County entity	Los Angeles County Public Works
Partners	CEO, Cities, DPH, DPR, Local water agencies, LACSD
Topic Tags	Landscapes & Ecosystems, Resilience, Water



Board of Supervisors Statement Of Proceedings April 5, 2016

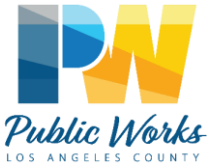
14. Recommendation as submitted by Supervisors Kuehl and Solis: Instruct the Director of Public Works, ~~in coordination with the County's Cities~~, to secure an expert firm to provide strategic consulting services and collaborate with cities throughout the County, local water agencies, business stakeholders, non-profit organizations, School Districts and other regional stakeholders, to design and develop and report back to the Board within 45 days with necessary actions, timeline, budget for developing a Drought Resiliency Work Plan to increase drought preparedness and local water self-reliance, improve water quality to protect public health and advance our communities' ability to adapt to the effects of climate change, designed to implement projects that improve capture of water from all sources to augment local water supply, improve water quality and include geographically distributed, multi-benefit projects that improve water management while also providing community amenities such as river parkways, green space and habitat, and additionally, reflect, but not necessarily be limited to, the region's water infrastructure needs identified in existing planning documents, including existing flood control district plans,

LA COUNTY WATER PLAN

Vision

The CWP articulates a shared, inclusive, regional path forward to sustainably and equitably achieve safe, clean, and reliable water resources for Los Angeles County.

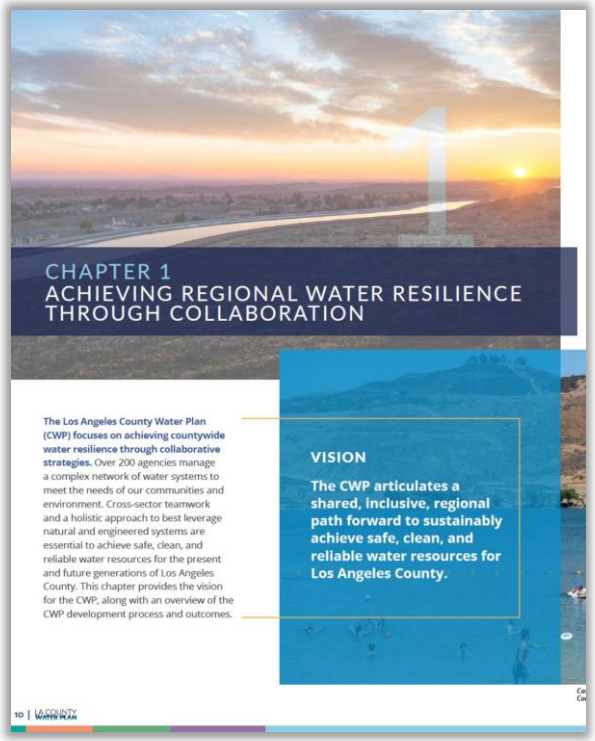
Resilience Through Collaboration



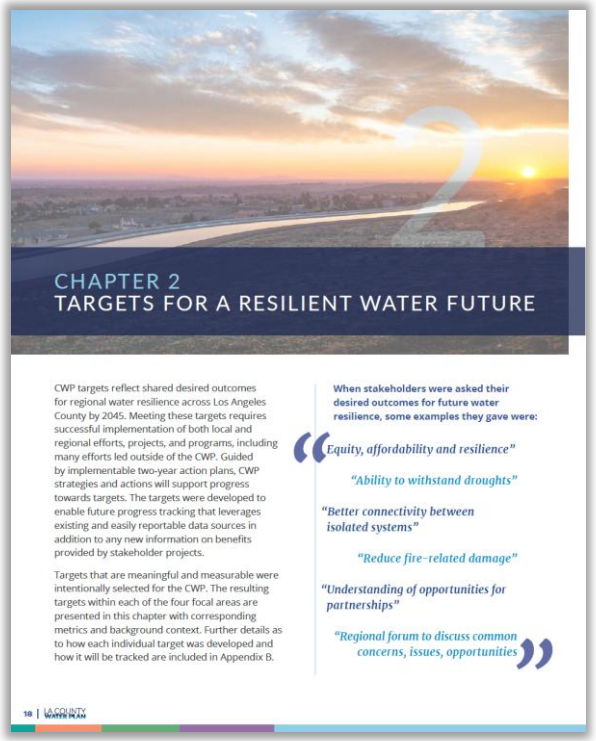
LA COUNTY
WATER PLAN

Development Process

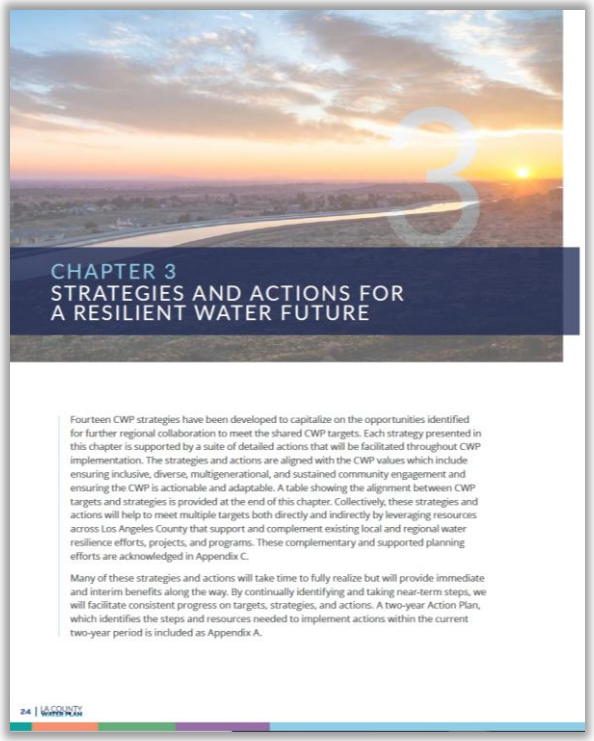
Overview of the Plan



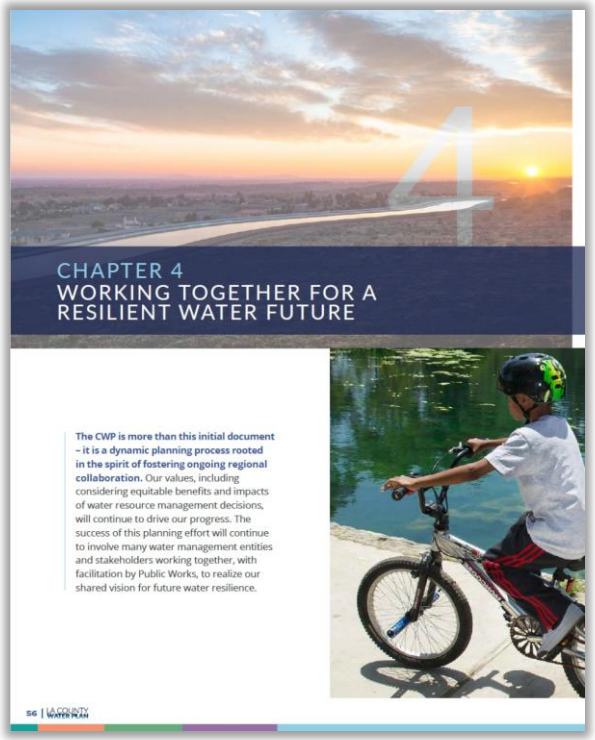
Vision



Targets



Strategies & Actions



Implementation

LA COUNTY WATER PLAN

Plan Elements

Targets

- Provide a metric to measure and track progress implementing the CWP

Strategies

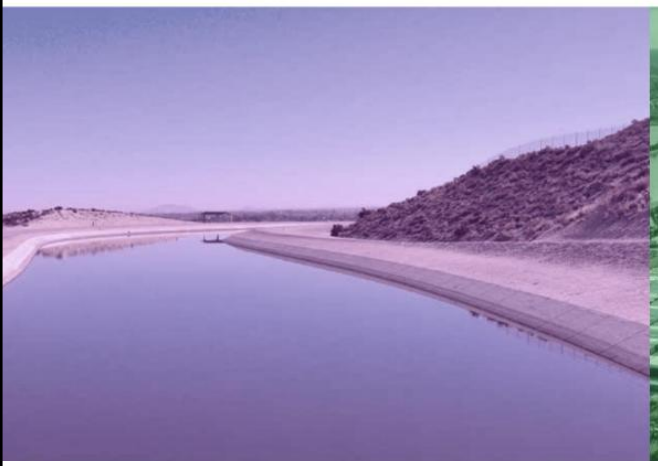
- Provide the regional, collaborative approaches to achieving the targets

Actions

- Specific steps to support the strategies
- Action Plan: Near-term implementation plan to be revised every two years

4 Key Focal Areas

REGIONAL WATER SUPPLY RELIABILITY



GROUNDWATER MANAGEMENT AND QUALITY

SMALL, AT-RISK SYSTEM RESILIENCE AND DRINKING WATER EQUITY

WATERSHED SEDIMENT MANAGEMENT

Water Resiliency Summit – April 29, 2024

4 Task Forces

Water Communications

Mission: Transform Los Angeles County water consumers to become empowered and informed water advocates in the region.

Nature-Based Solutions

Mission: Support the use of nature-based water management solutions across the County to improve the health of communities and ecosystems.

Regional Water Reliability

Mission: Strengthen regional collaborations and partnerships to address climate change impacts, enhance environmental benefits, and support long-term, diverse, and reliable water resources development.

Small Water Systems

*Mission: S*upport small water systems within Los Angeles County to improve drinking water equity and create longer-term resilience and higher-quality supplies.

CWP is a "Living Document"

CWP Strategies & Actions

+ YOUR Local & Regional Efforts

CWP Targets

Advancing Towards Resiliency

CWP Task Forces & Regional Collaborators are pursuing these key steps:

- **Increasing** Local Water Supply by Approximately 600,000 AFY by 2045
- **Implementing** CWP 2-Year Action Plans
- **Hosting** 2025 Water Resiliency Summit
- **Adopting** the LA County Water Plan

Keep in touch!

LACountyWaterPlan.org

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Principal Engineer

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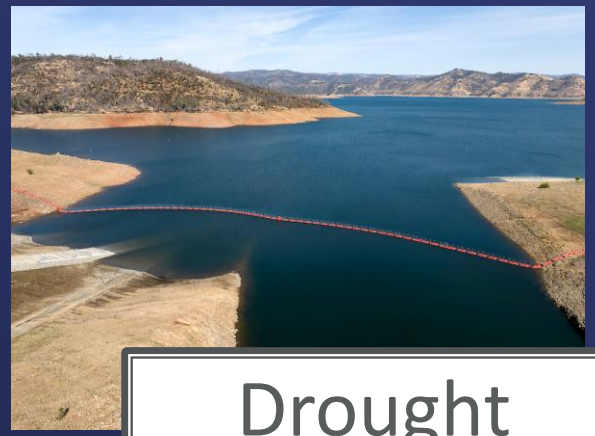
LA COUNTY WATER PLAN

Public Works
LOS ANGELES COUNTY

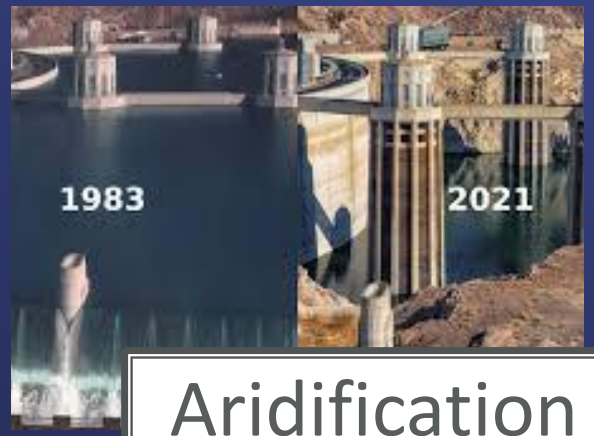
Increasing Climate Resilience at Metropolitan Water District

SUSTAINABILITY
RESILIENCE
INNOVATION

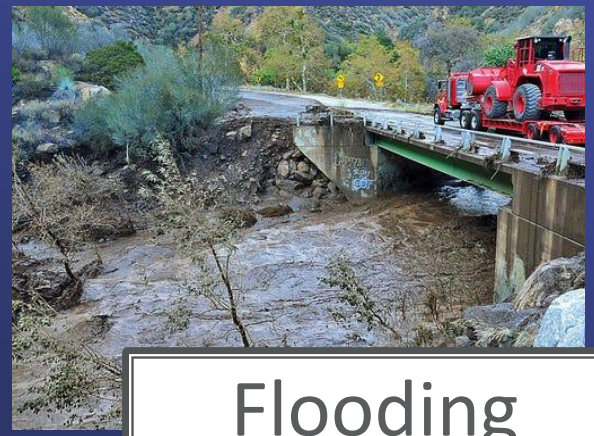
Experienced Climate Impacts Led to Climate Adaptation Planning Process



Drought



Aridification



Flooding

Extreme Heat

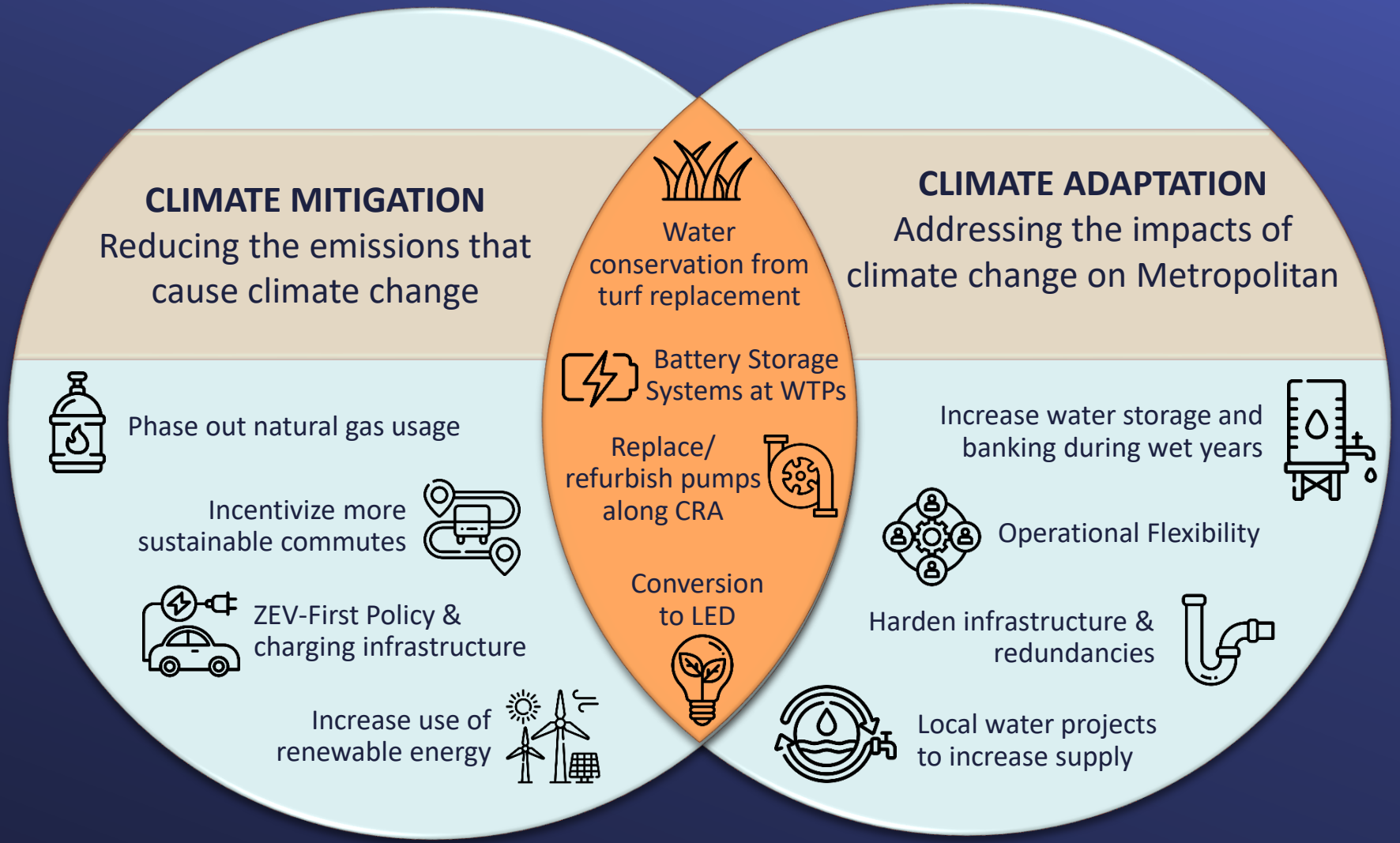
Sea Level Rise

Fire

Climate Strategy

Metropolitan builds climate resilience by continuing to reduce its GHG emissions & by investing to manage more frequent & severe climate hazards.

Increasing Climate Resilience



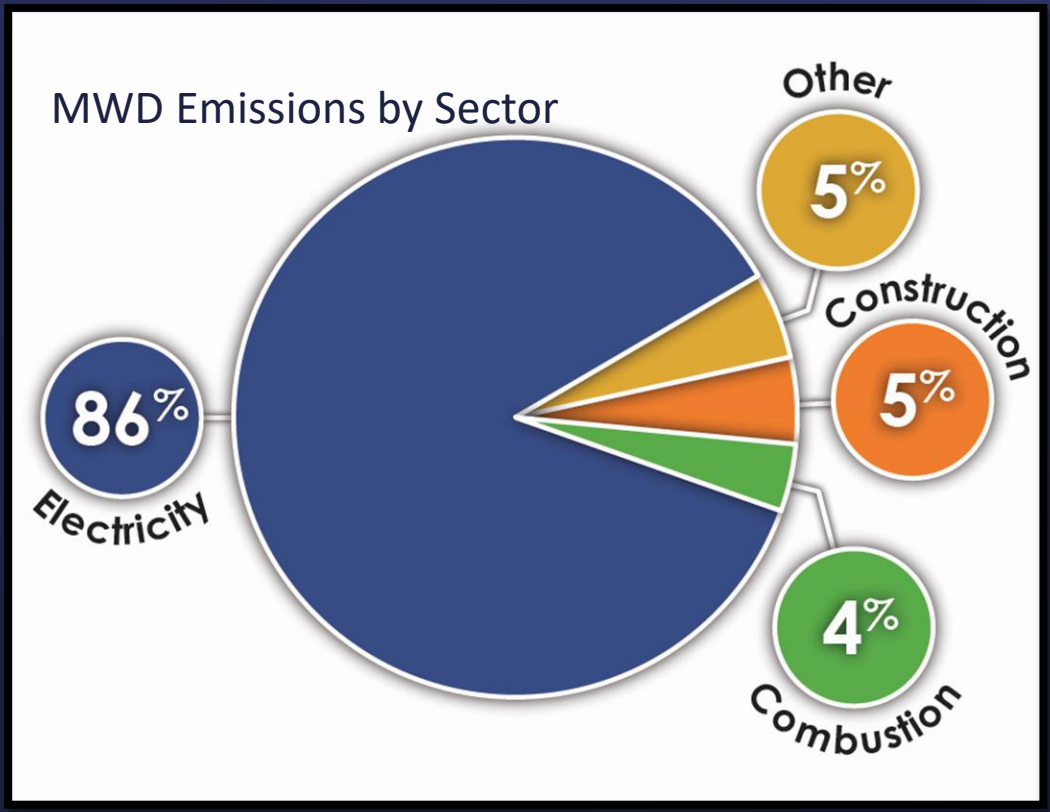
Climate Action Plan - GHG Reduction Targets

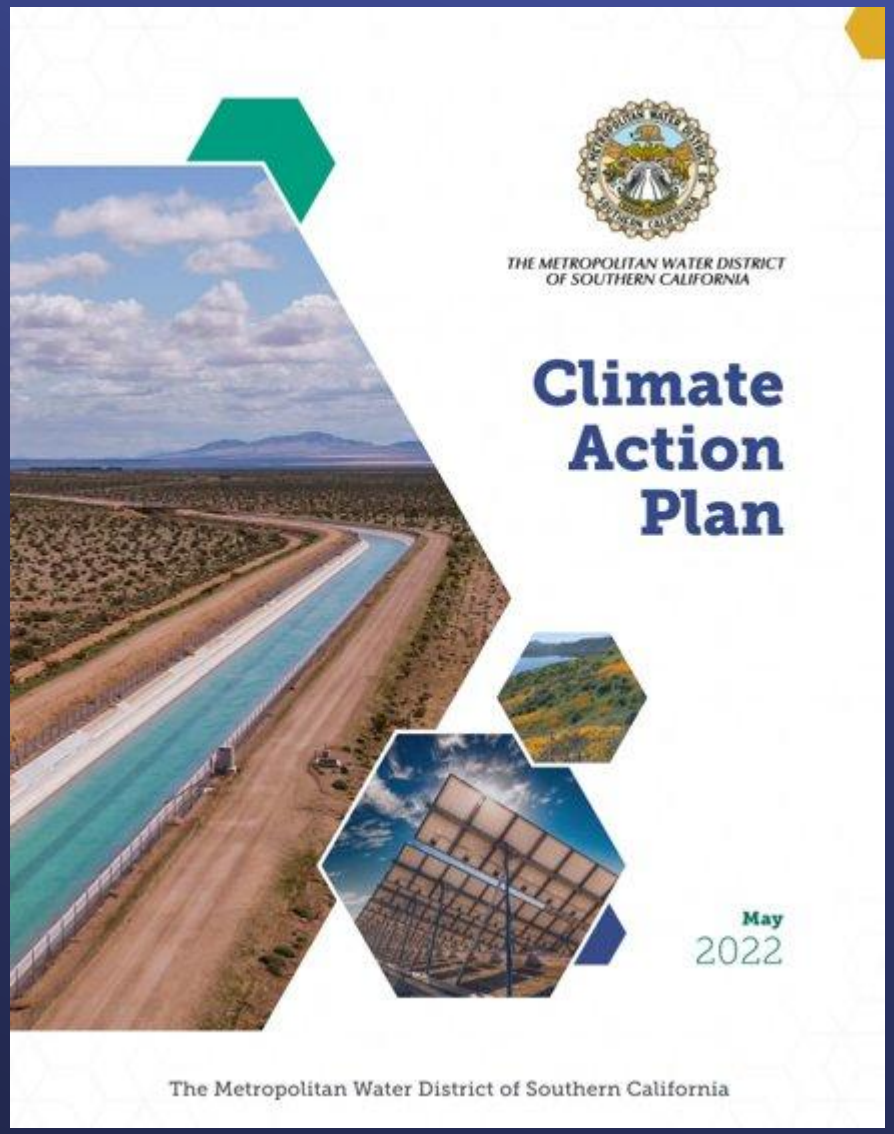
Established an emissions target:

- Carbon neutrality by the year 2045

Interim target to ensure compliance:

- 40% below 1990 levels by 2030





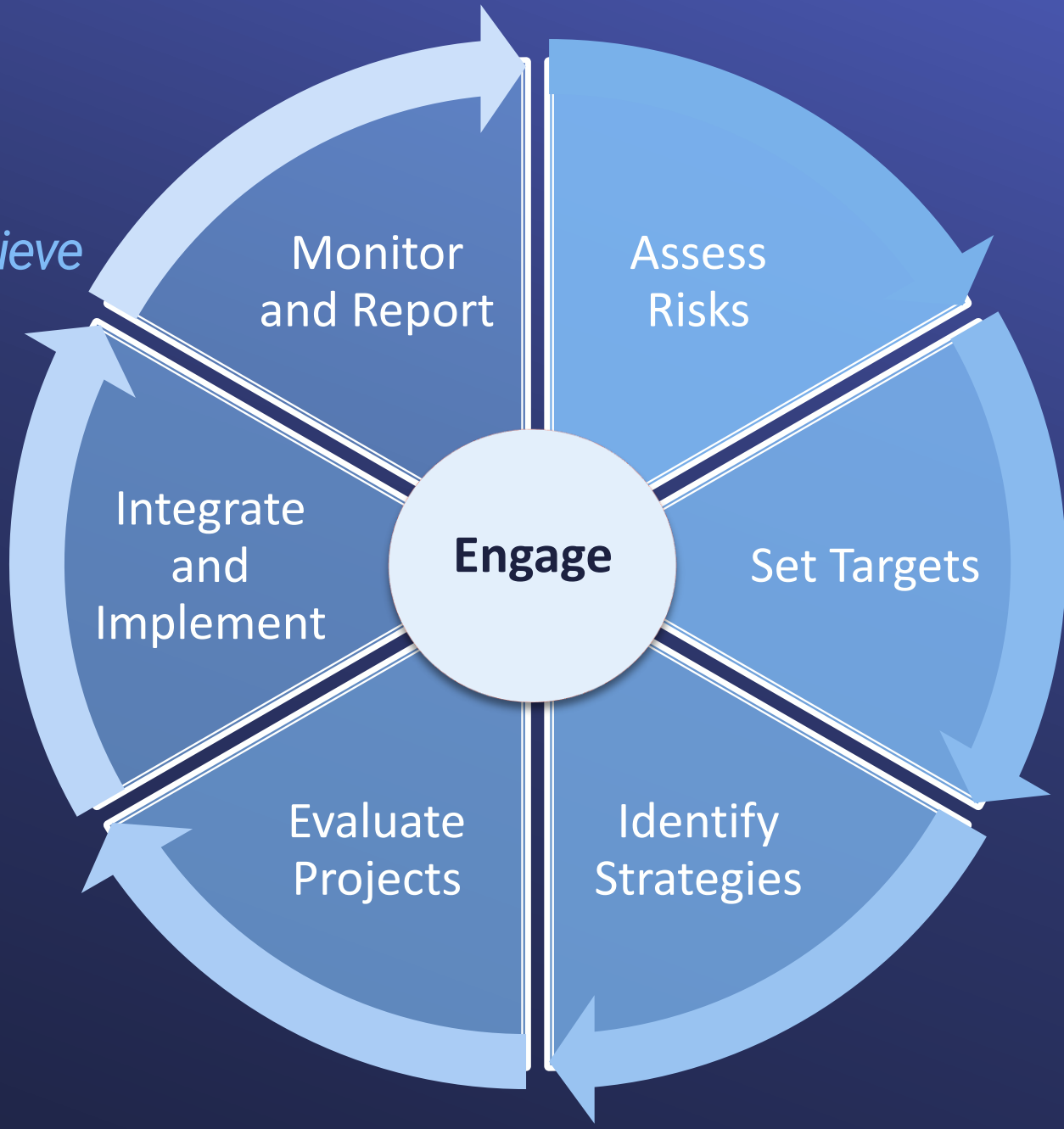
Climate Adaptation Master Plan for Water

An Iterative and Adaptive Process to Achieve Long-Term Regional Resilience

CAMP4W integrates

- water resources planning
- infrastructure development
- climate adaptation
- finance planning

into one interconnected and iterative process.



CAMP4W
Climate Adaptation Master Plan for Water

CAMP4W Designed to Achieve Long-Term Regional Resilience

What does Resilience mean?

Resilience is the capacity of any entity – an individual, a community, an organization, or a natural system – to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience.

CAMP4W Designed to Achieve Long-Term Regional Resilience

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CAMP4W…Not your typical Master Plan.

Iterative

refining and improving over time

Adaptive

adjusting to changing conditions

Innovative

introducing new approaches

CAMP4W…Not your typical Master Plan.

Iterative

refining and improving over time

- Review and update data annually
- Employ best available climate science and methodologies
- Continual improvement

Adaptive

adjusting to changing conditions

- Consider a range of potential futures
- Track current trends
- Adjust based on real world conditions
- Consider phasing of implementation

Innovative

introducing new approaches

- Integrates water, climate, finance
- Provides standardized assessment method
- Evaluates all types of decisions
- Collaboratively developed

Climate Adaptation Master Plan for Water

IRP Regional Needs Assessment

Climate Risk and Vulnerability Assessments

Infrastructure Studies and Assessments

Public & Partners Engagement

Implementation Strategy

Time-Bound Targets

Policy Framework

Implementation Timelines

Climate Decision-Making Framework

Evaluative Criteria

Project/Program Assessments

CIP Integration

Adaptive Management

Signposts

Annual Reports

Long-Term Reviews

Business Model Alignment

Water Resources Strategies

Financial Strategies

Affordability Strategies

Financial Forecast and Budget

CAMP4W Comprehensive Assessment

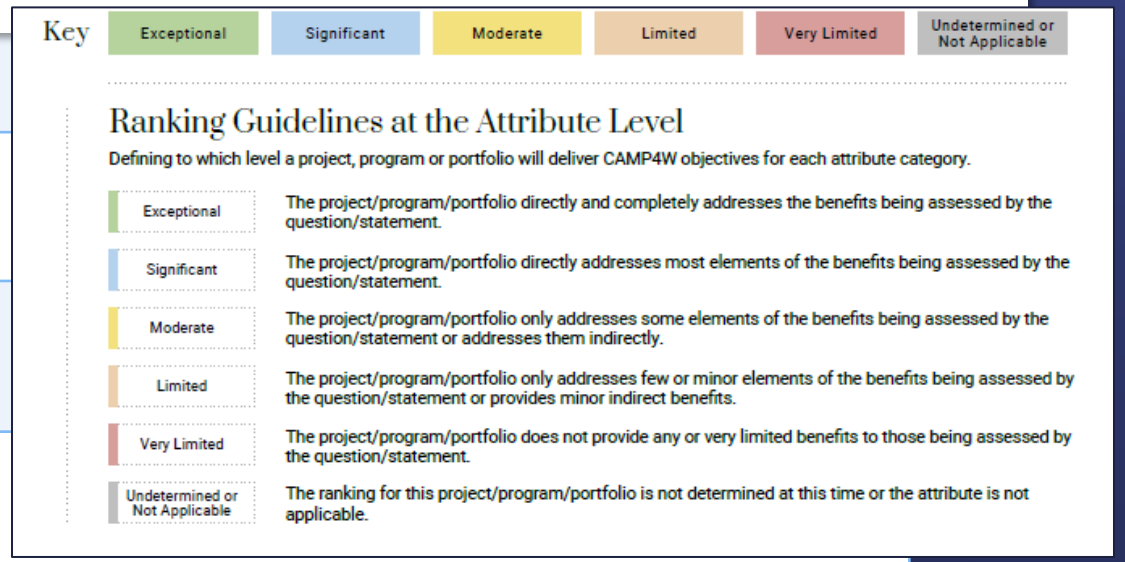
Rubric Includes Quantitative and Qualitative Measures

Evaluative Criteria
Reliability
Resilience
Financial Sustainability & Affordability
Adaptability & Flexibility
Equity
Environmental Co-benefits

Each **project** or **program** would be considered through a robust narrative description of how project attributes achieve each objective

Descriptions could include:

- ✓ Quantitative metrics
- ✓ Qualitative information
- ✓ Gaps in information available



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.

CAMP4W Themes Inform Policy Framework and Initiatives

Themes	Policy Framework
Reliability	➢ Metropolitan will consider climate risks and integrate climate adaptation strategies into water supply programs, policies, planning, implementation and operations
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
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
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
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

Climate Adaptation Policy Framework

Themes	Policy Framework
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

Example Initiatives:

Establish Resilient Infrastructure Guidelines

Assess power system vulnerabilities

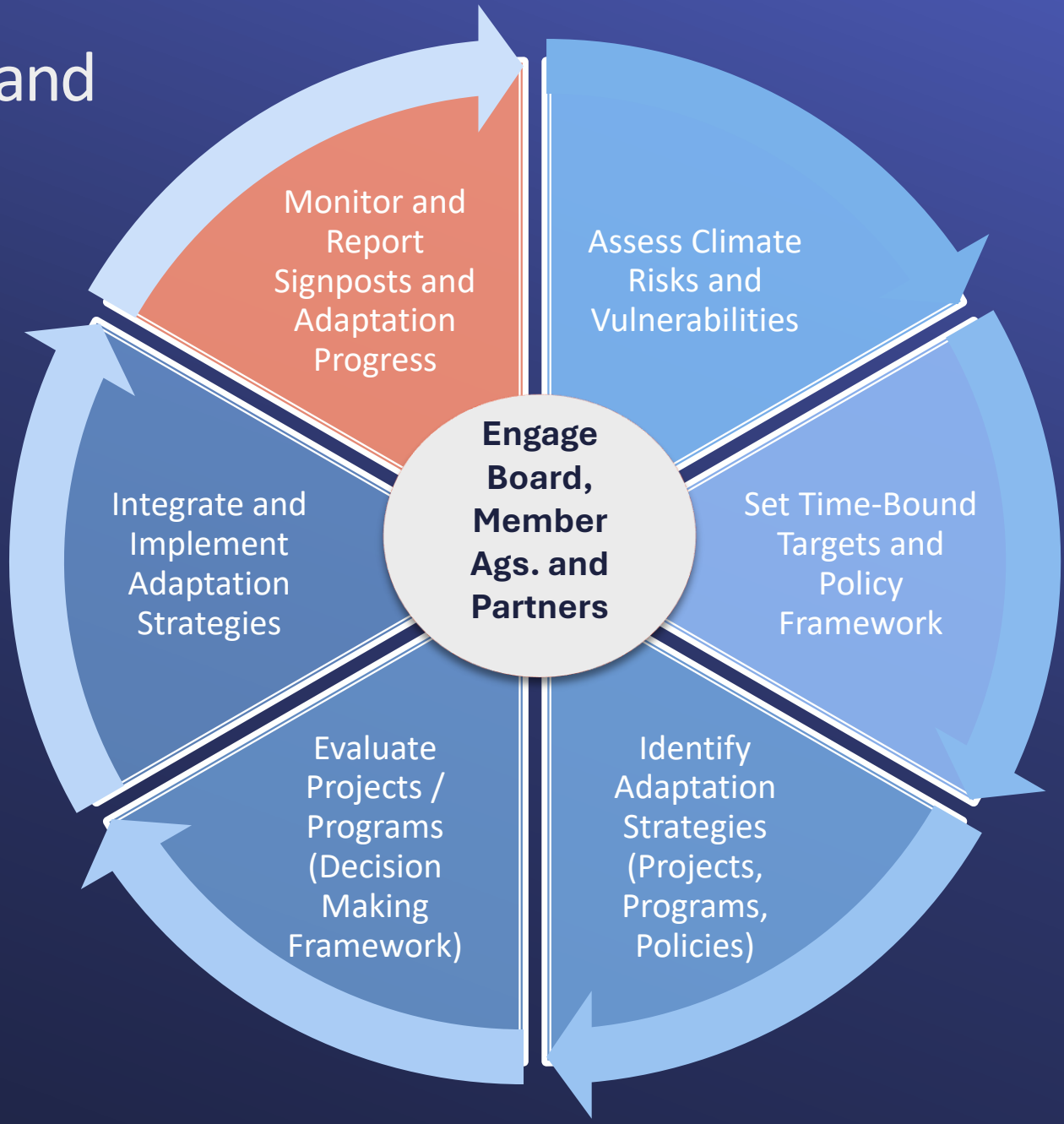
Develop response indicators and action plans for primary climate threats to water quality

Review workforce safety measures for climate risks

Update fire management plans for critical facilities

Monitor and Report Signposts and Adaptation Strategies

- ✓ Identified Water Supply, Infrastructure, and Financial Signposts
- ✓ 2024 Annual Report



Water Supply Reliability Signpost Metrics

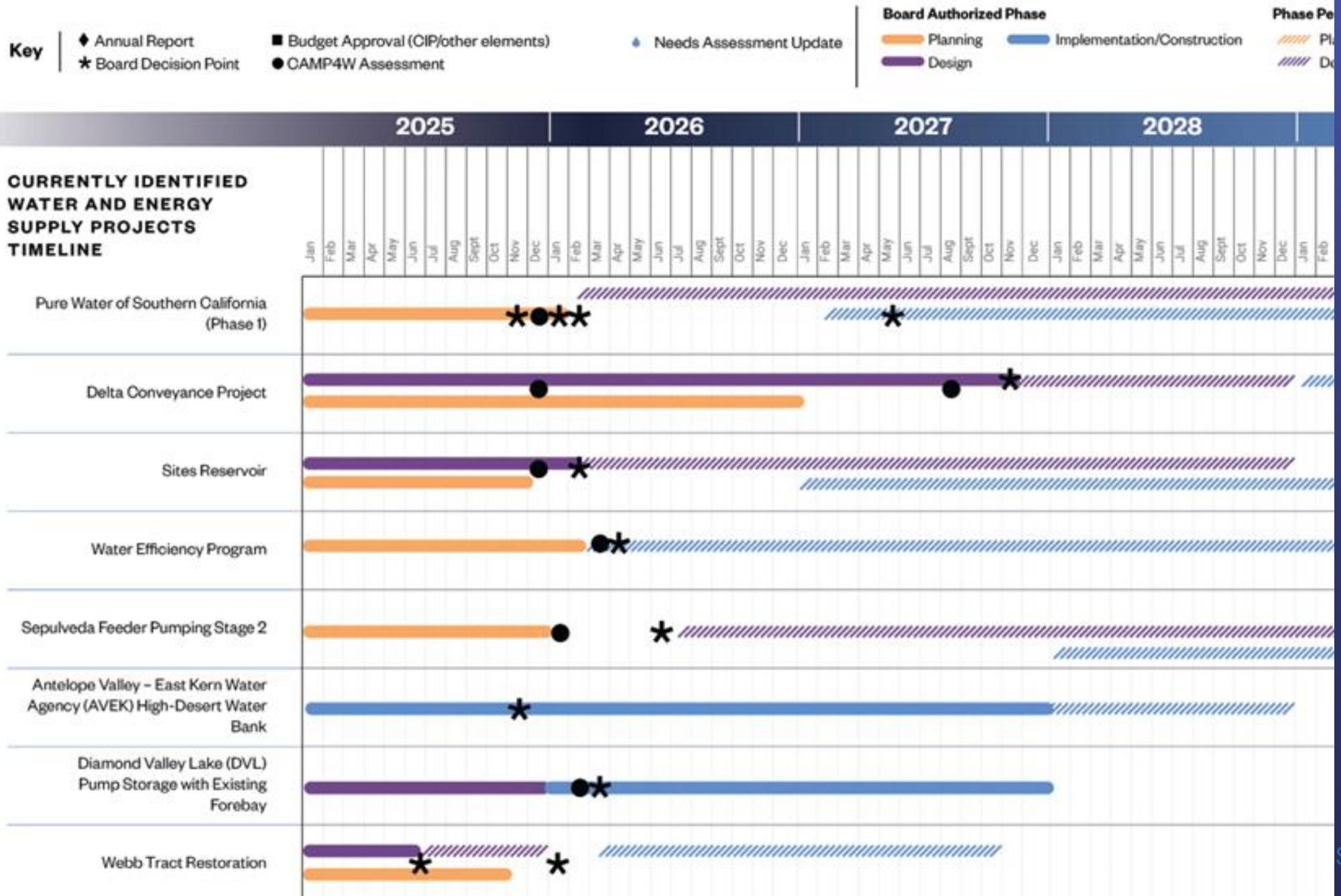
Demographics		Trends in population, housing, and employment
Climate Change		Industry understanding of climate change impacts and emissions
Local Agency Supply		Trends in local agency supply production and capability
Imported Supply (Risks & Regulations)		Resulting supply impacts from climate change and regulations
Storage		Storage capability and accessibility

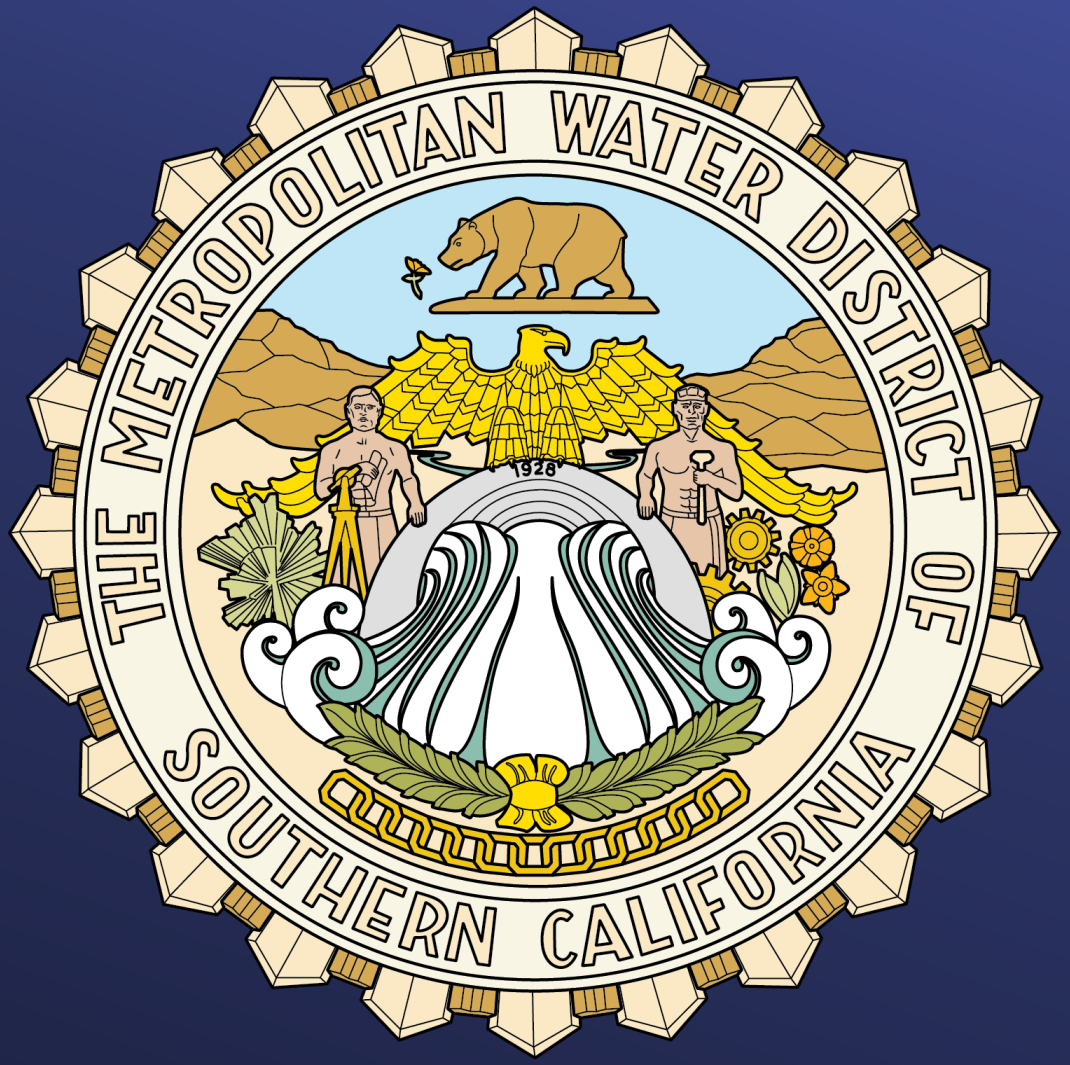
Key Takeaways for CAMP4W Implementation Phase

- Scenario planning allows us to consider a variety of futures given the uncertainties of climate change
- Time-Bound Targets represent the range of possible futures and are used for planning purposes
- Adaptive management approach includes tracking signposts and current trends to inform Board decision-making
- Climate Decision-Making Framework provides a comprehensive and standardized approach to evaluating potential adaptation investments
- Climate Adaptation Policy Framework guides initiatives and the institutionalization of climate adaptation across Metropolitan

Adaptation Strategies: Water and Energy Projects Planned for CAMP4W Assessment

Timelines are




THE METROPOLITAN WATER DISTRICT OF
SOUTHERN CALIFORNIA
1928

SCAG Toolbox Tuesday: Water Resilience Challenges & Opportunities

Ryan Shaw
Director of Water Resources

WESTERN WATER

WESTERN WATER SERVICE AREA

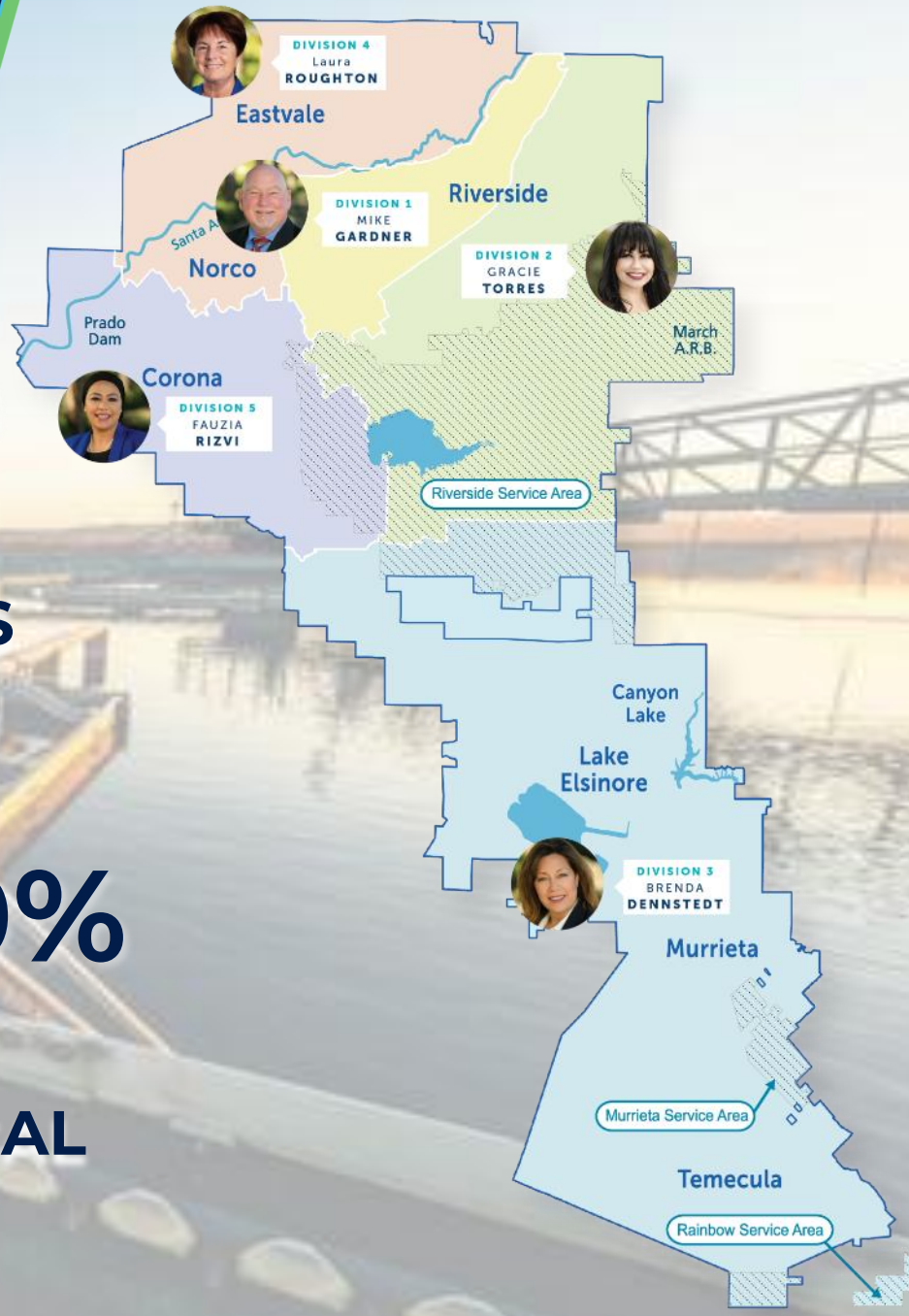
1M+
PEOPLE SERVED

14
WHOLESALE CUSTOMERS

~25,000
RETAIL CONNECTIONS

25B
GALLONS DELIVERED PER YEAR

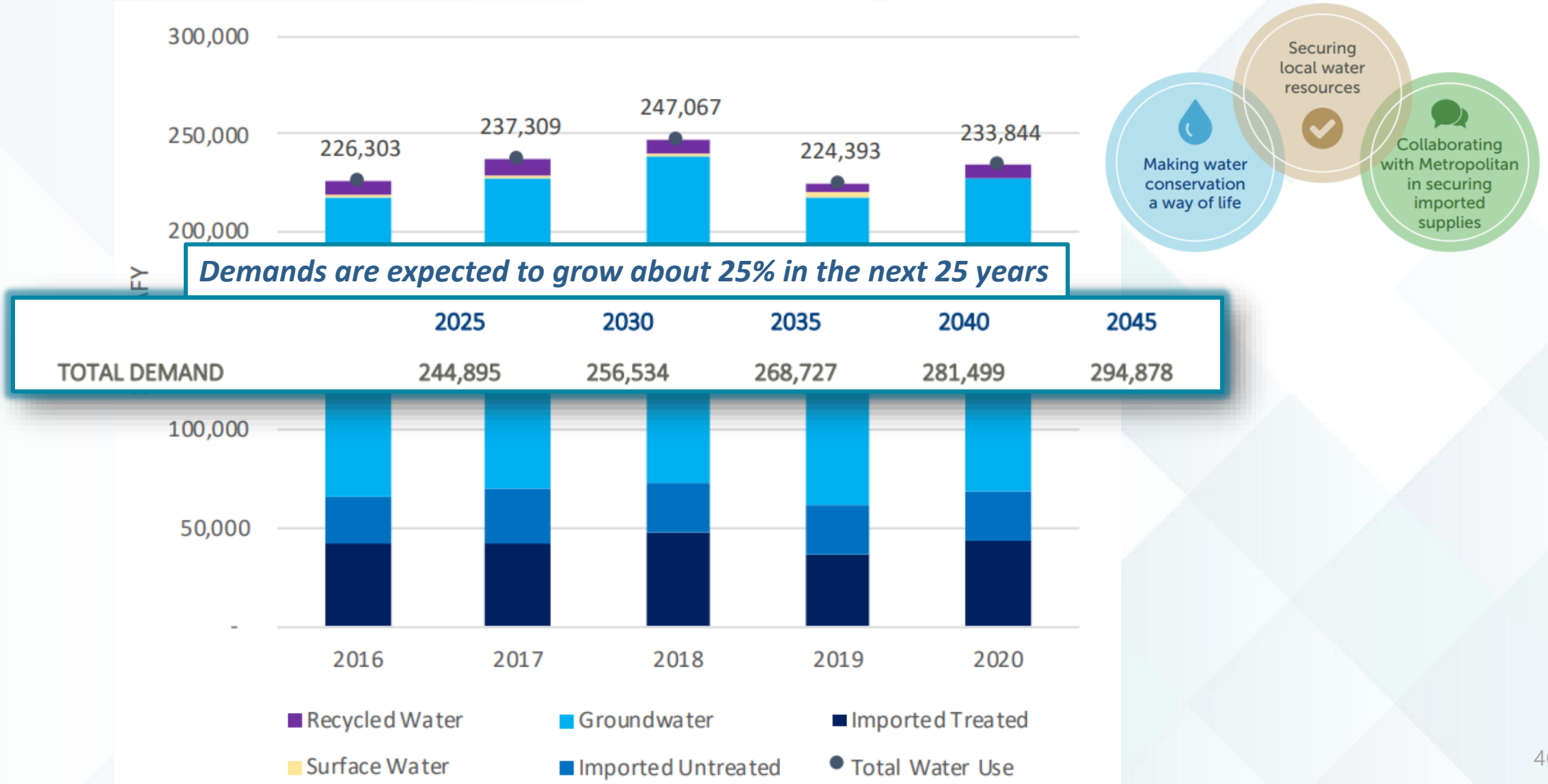
60% | 40%
IMPORTED | LOCAL



Water Resiliency

- Statewide Storage
  - SB 72 (Caballero)
- Imported Water
- Groundwater
- Recycled Water
- Stormwater Capture
- Water Use Efficiency
- Partnerships

Western's Demand Projection



Demands are expected to grow about 25% in the next 25 years

	2025	2030	2035	2040	2045
TOTAL DEMAND	244,895	256,534	268,727	281,499	294,878

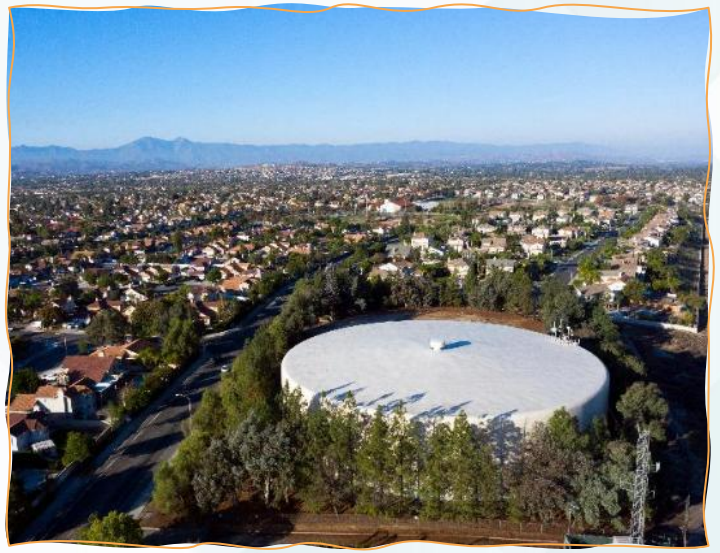
Managing Water to Support Future Growth

Challenges

- Regulatory Requirements
- Basin Sustainability
- Climate Change/Drought

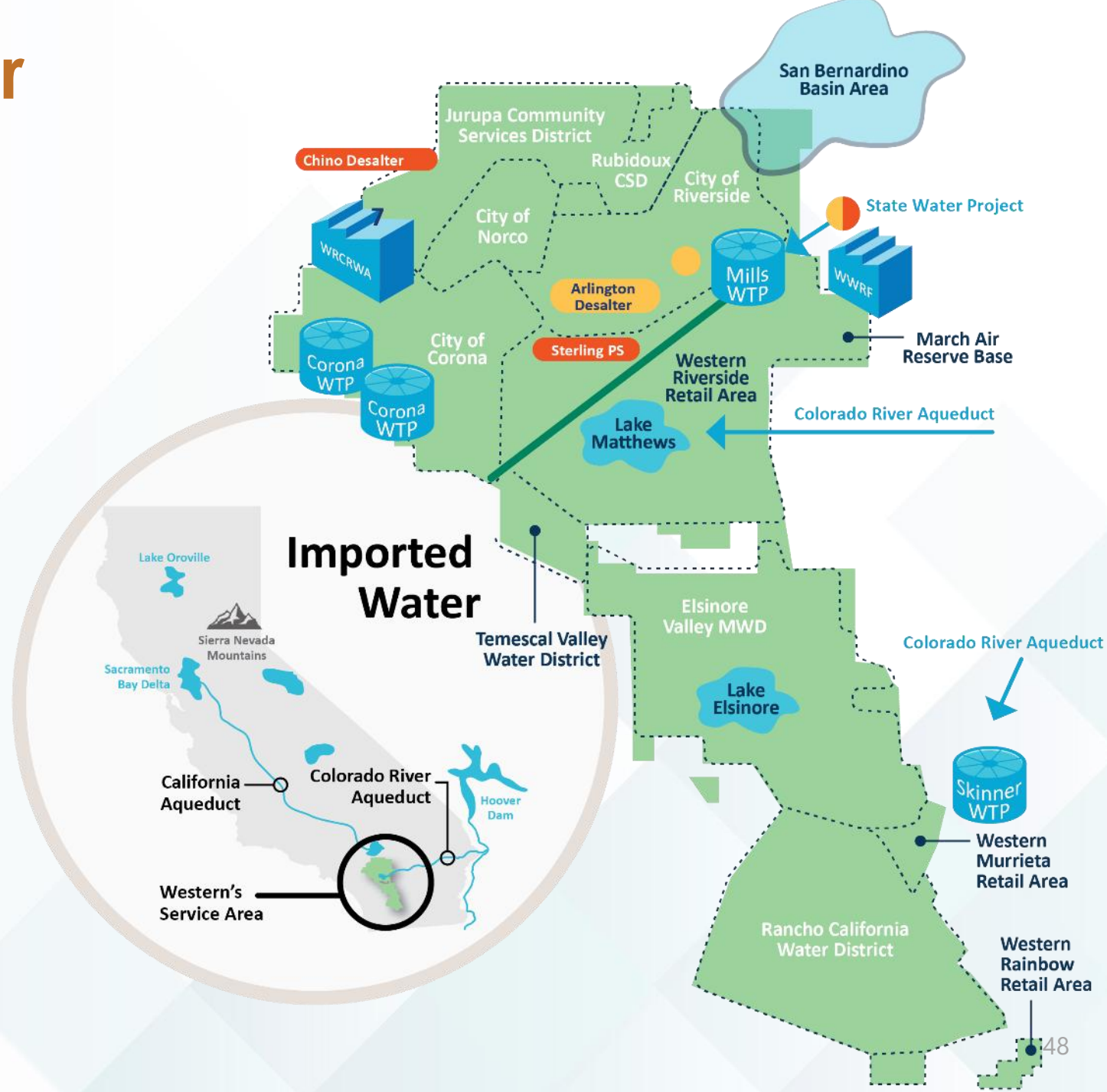
Solutions

- Statewide Storage
- Recycled Water
- Stormwater Capture & Recharge
- Groundwater Desalters



Riverside County Water Task Force

- Legislation
- Development/Growth
- Rate Increases
- Water Supply Conditions
- Partnerships



Thank You!

Ryan Shaw
Director of Water Resources

Tell us how we did!

Take a quick 2-minute survey to help us improve future Toolbox Tuesdays!