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Leading the Way in Climate Change Forecasting with Conservation Water Savings for Sustainable Communities

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MADDAUS WATER MANAGEMENT

The Water Demand Reduction Challenge

Why are U.S. water utilities under intense pressure to reduce consumption?

- Hydrologic deficit
- Rulings by judges
- Water use reduction targets set by politicians
- Difficultly in building new supplies
- Other reasons including economics, long term changes in weather (climate) and environmental goals
- Deferral of expensive capital improvement projects
- State requirements for conservation planning and implementation

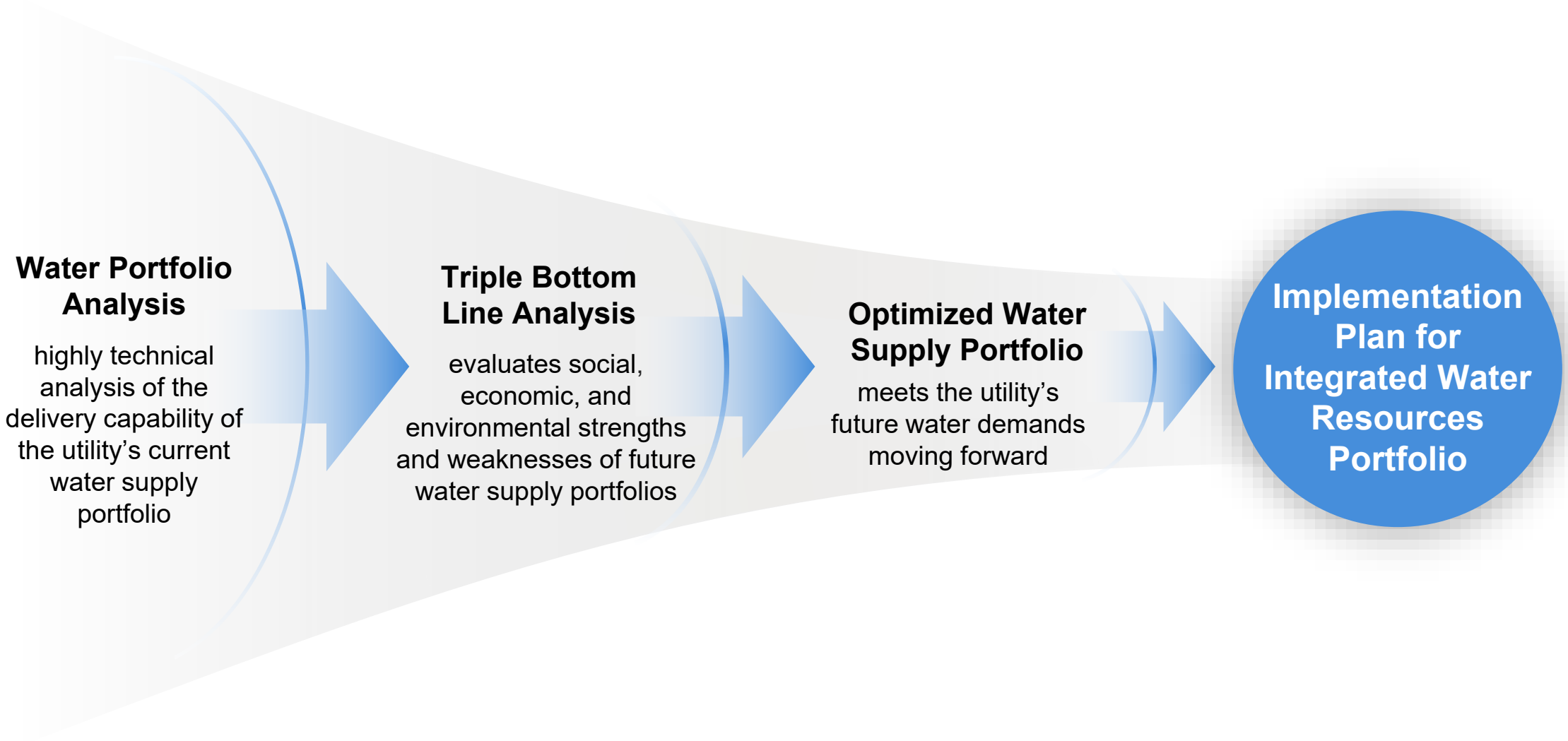
Forecasting Benefits

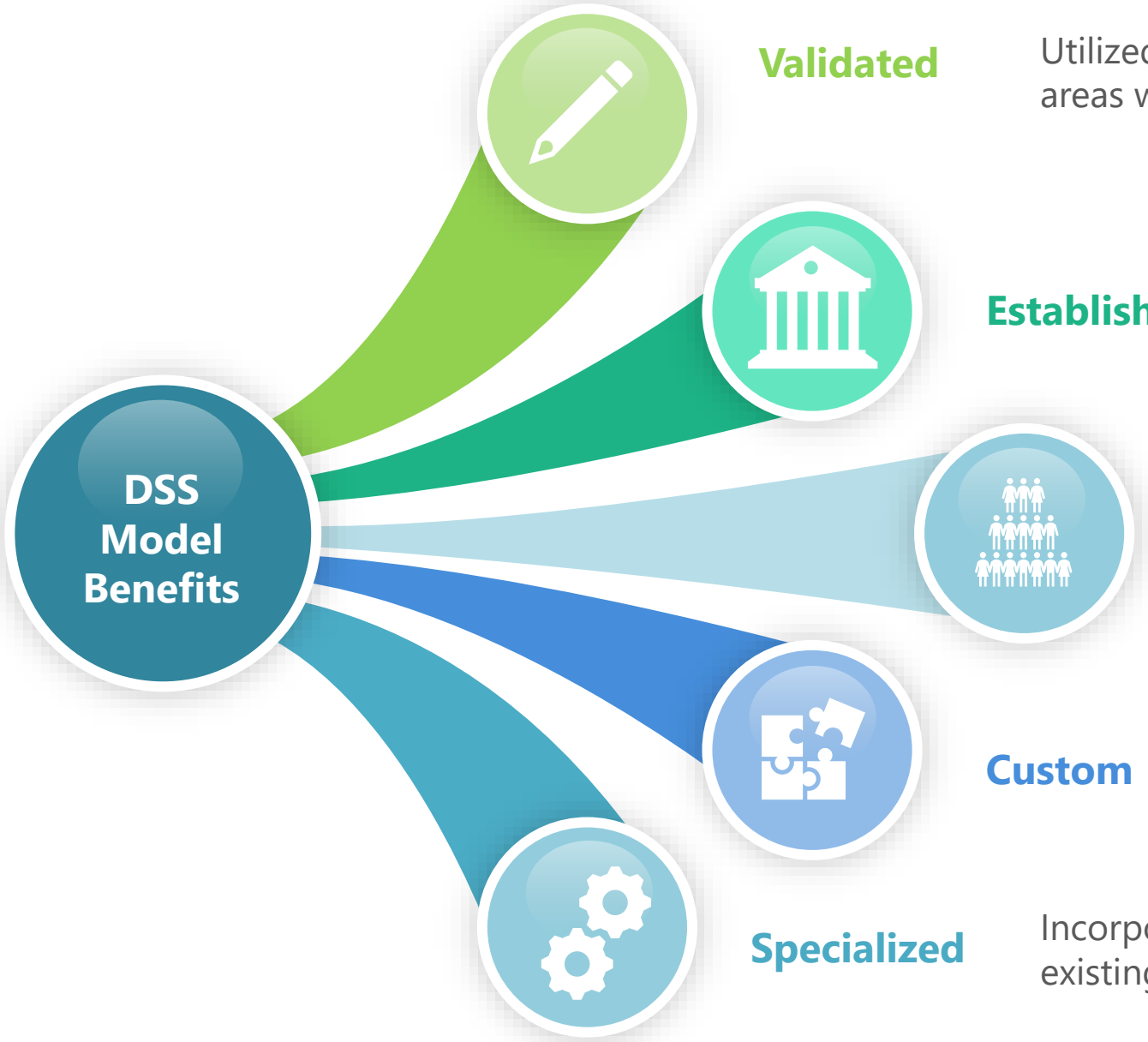
- Improved financial stability
- Enhanced knowledge of infrastructure needs
- Improved understanding of overall range in per capita water use over time
- Utility with more robust forecast can budget better to meet conservation targets

Why These Adjustments Are Important To Do

- Individual model
- Regional model
- Land use-based forecast
- Climate change
- Drought rebound
- High/low population growth
- High/low jobs growth
- Conservation
  - Passive
  - Active

Forecasting Methodology – Layering in Key Information





Validated

Utilized in over 300 service areas worldwide

Established

Developed and industry-approved since 1999; continually updated

Peer-Reviewed

End-use model peer-reviewed by industry specialists

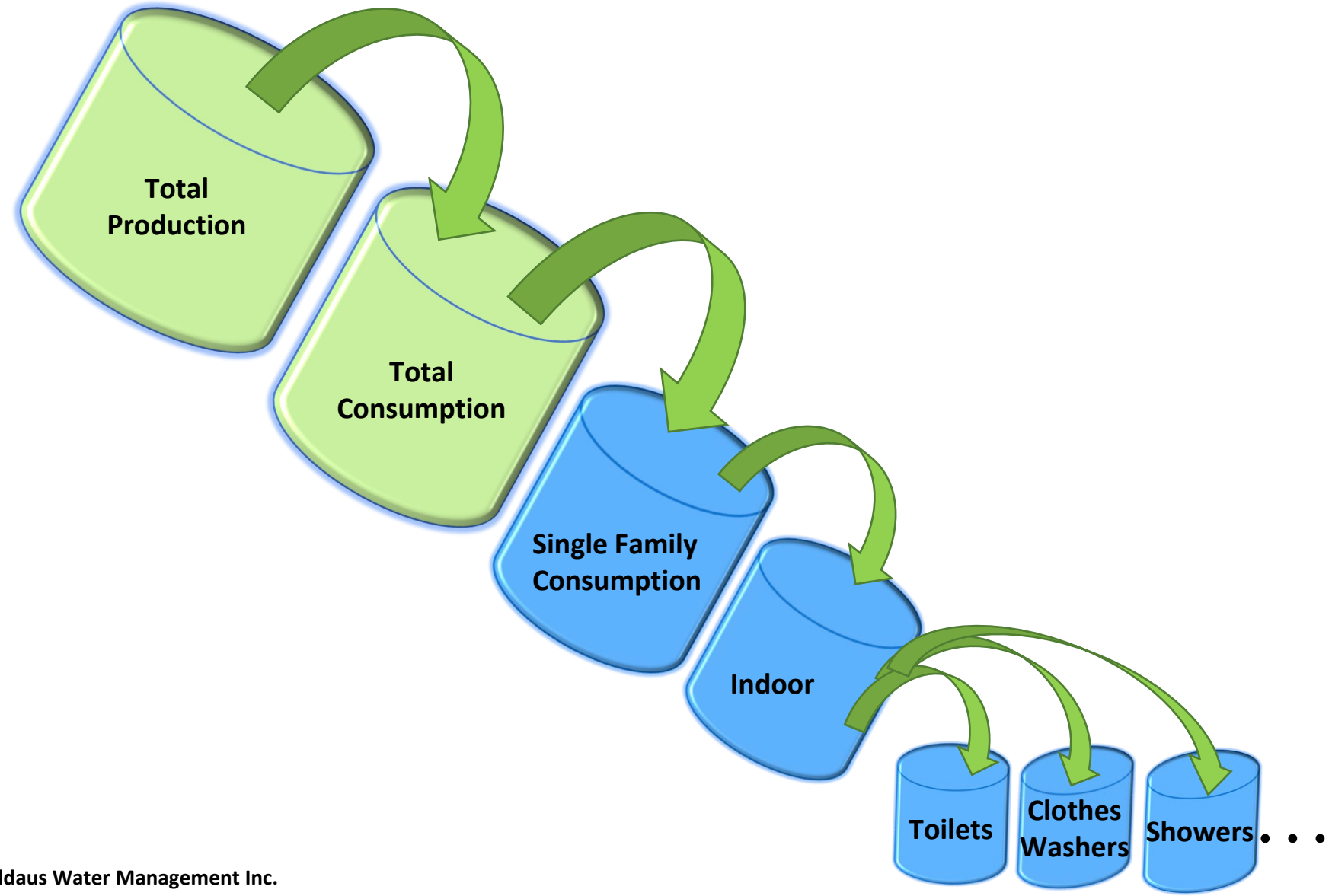
Custom

Returns multiple user-defined water demand and conservation program scenarios; flexible input options

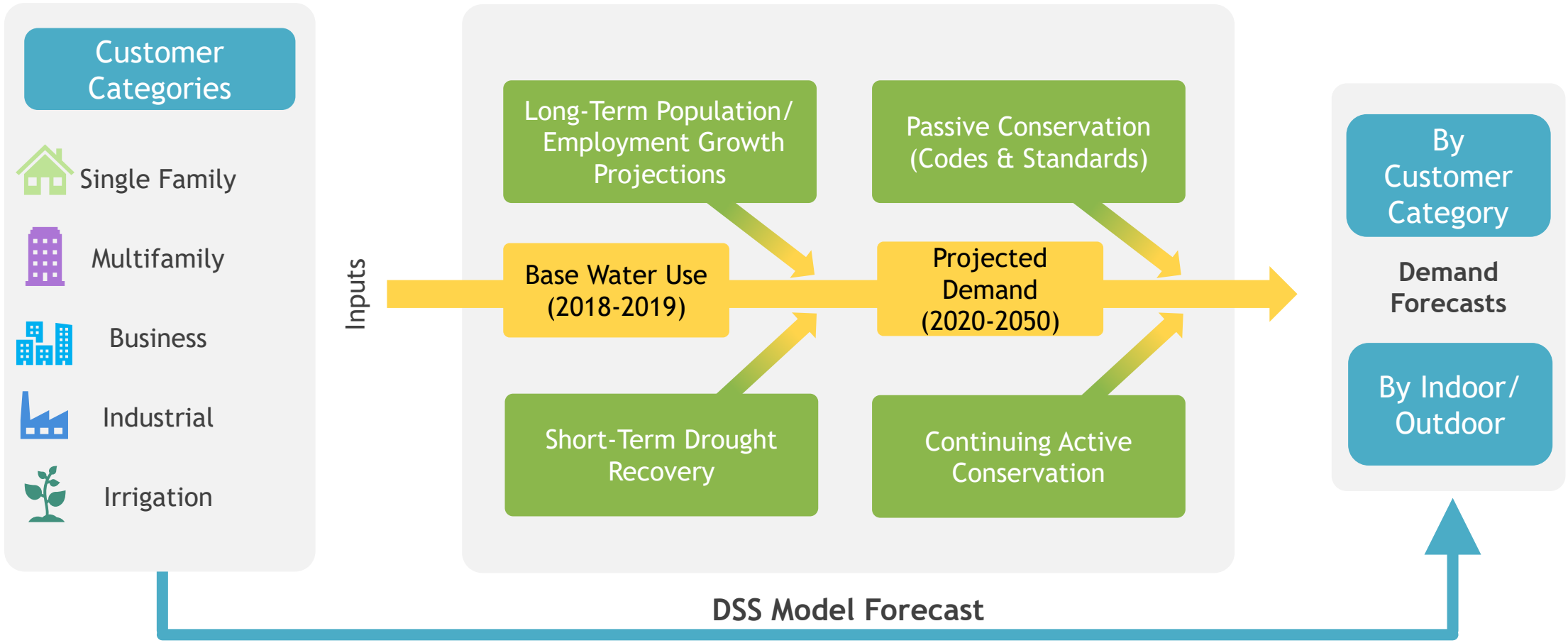
Specialized

Incorporates state and local codes and existing conservation measures

Modeling at the “End Use” Level: Why It Matters

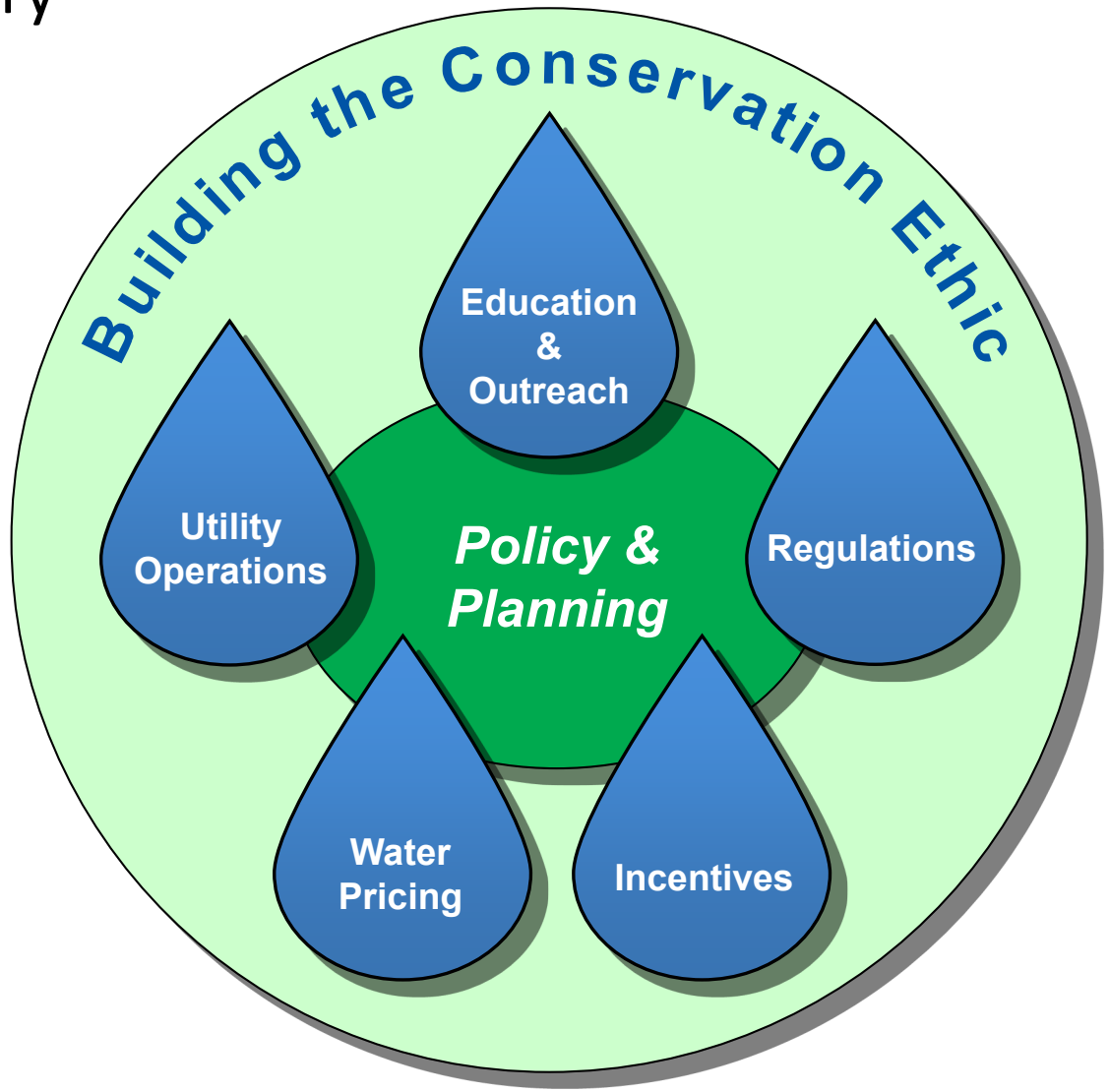


Least Cost Planning Decision Support System (DSS Model) Flow



Elements of Demand Side Management (or Conservation) Program Planning

- Tailored to each unique customer category
- Benefits
  - Water savings
  - Cost savings
- Costs
  - Labor
  - Expenses
- Step by step approach to building your business case and program
- Challenging management factors or perceptions
- Portfolio of funding options
  - Ratepayer dollars
  - Grants/loans
  - Volunteers
  - Developer fees



Case Studies

- Santa Clarita Valley Water Agency, CA
- City of Santa Barbara, CA
- Bay Area Water Supply and Conservation Agency, CA
- Central Utah Water Conservancy District, UT

Case Study: SCV Water, California (pop. 290,000)

- Demand and Conservation Analysis Study prepared as part of the 2020 Urban Water Management Plan (UWMP)
- Ongoing monitoring of water consumption, implementing water conservation and planning for the SCV community
- UWMP due every 5 years
  - Long-range planning document to identify future water demands and project attainable conservation goals
- Update for 2020 UWMP
  - Best available information for future demand land use-based forecast
  - Worked carefully with City and County Land Use Planners
- Result of a careful modeling exercise based on community's historical water use and planned future needs

SCV WATER

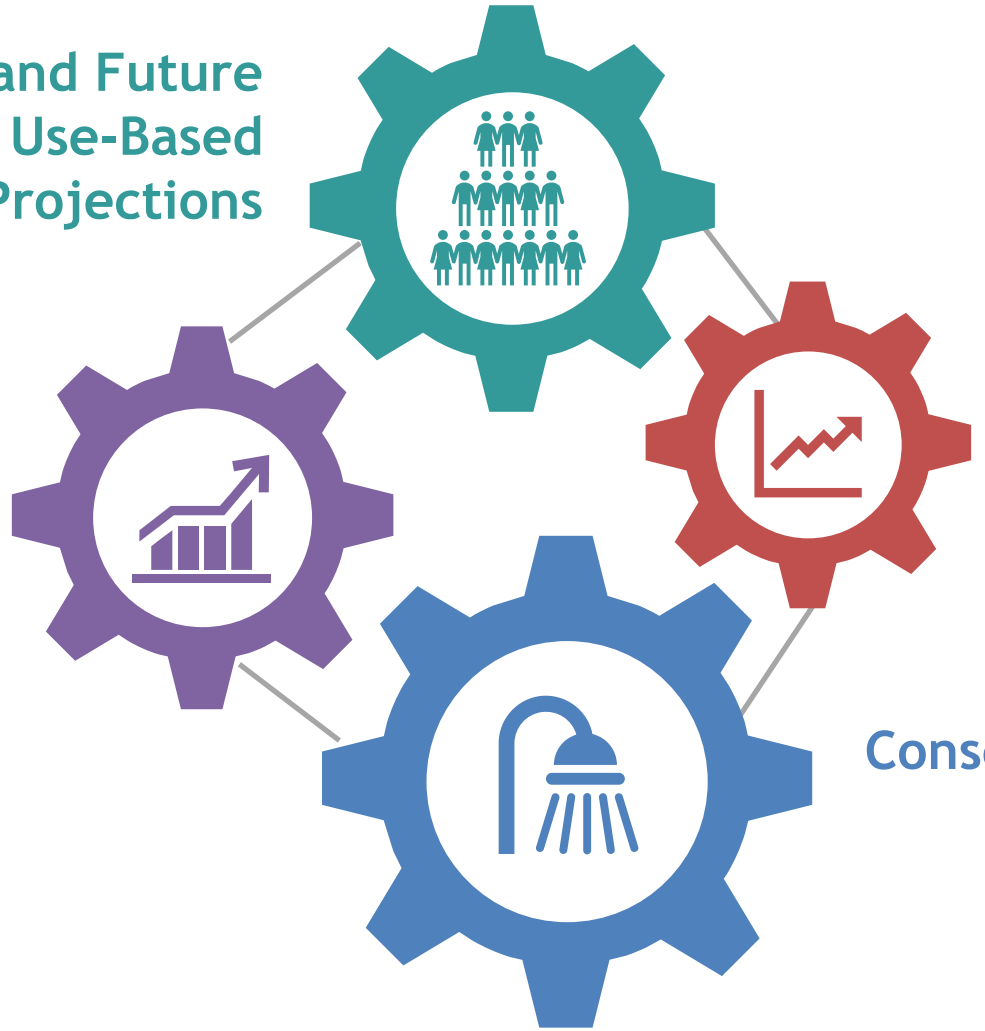
SCV Water Demand Study Approach

Existing and Future Land Use-Based Projections

Demands with Plumbing Code

Historical Post-Drought Base Demands

Conservation Measures



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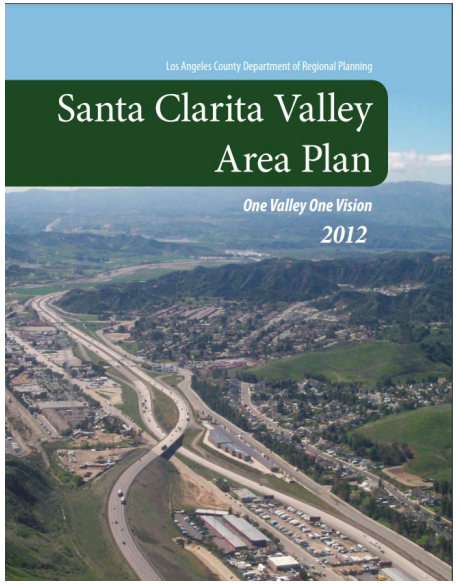
Overview of the Demand Forecast Development

Land Use Projection Development → Water Demand Projection Development → Analyze Historical Demands → Consider Future Conservation Changes/ Adjustments → Total Demand Reductions with Conservation



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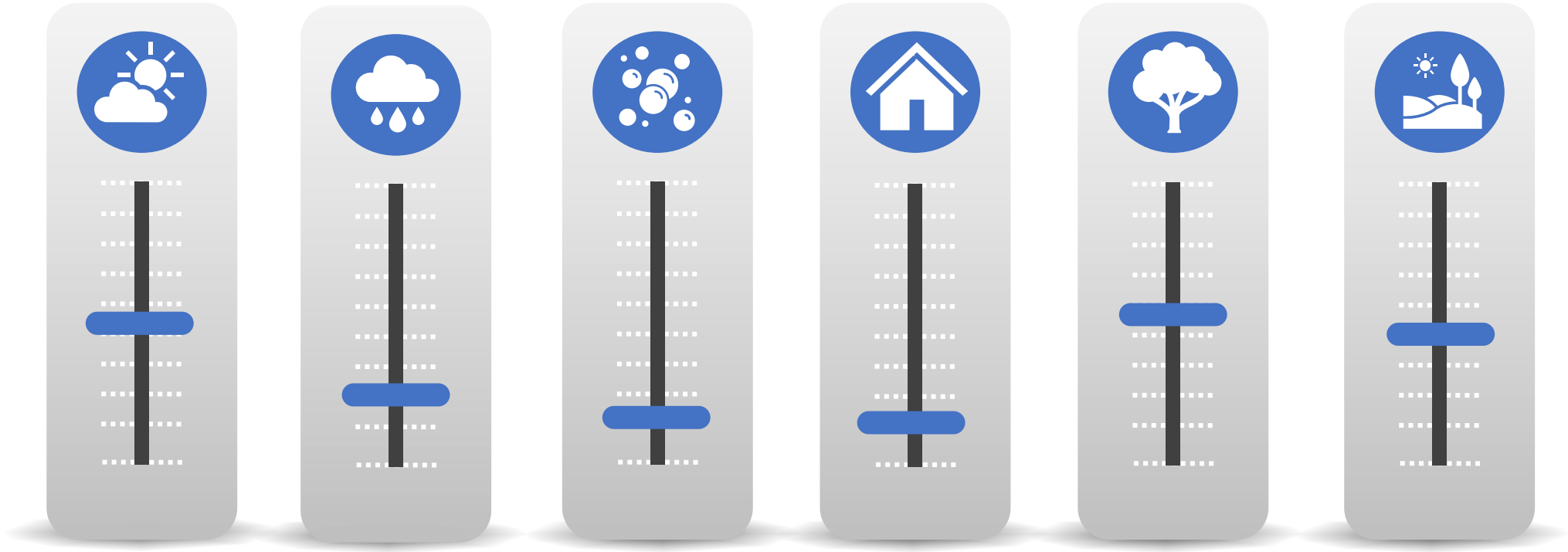
Adjustments to Future Demand Forecast



Climate Change & Weather Normalization

Drought Rebound

COVID-19

Accessory Dwelling Units

Irrigation Demand Factor

Outdoor Conservation Potential

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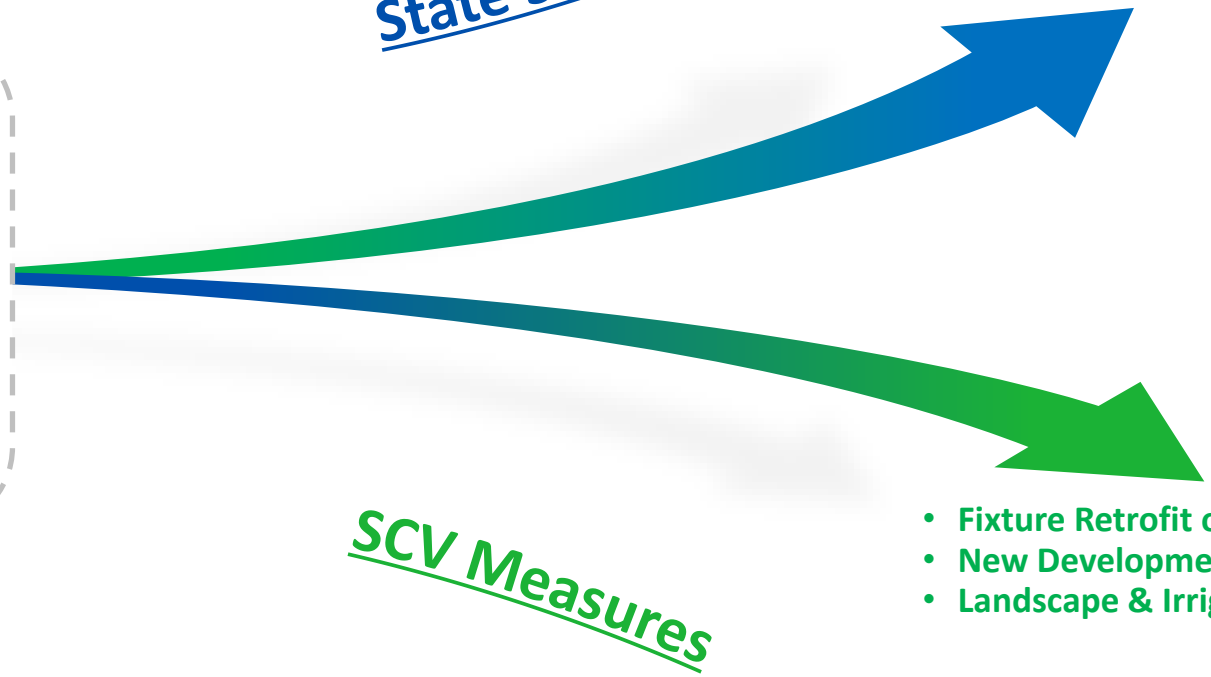
Passive Savings from Plumbing Code

Water Efficiency Codes & Standards



State Standards

- 2019 CALGreen New Buildings
- 2016 CA Code of Regulations Title 20 (adopted 2015)
- Assembly Bill 715 (2014)
- Senate Bill 837 (2011)
- Senate Bill 407 (2009)
- Federal Energy Policy Act (1992)

SCV Measures

- Fixture Retrofit on Resale/Water Account Change
- New Development Submetering
- Landscape & Irrigation Codes

SCV WATER

Current Water Conservation Program

- Water waste prevention
- Landscape design standards
- Website, videos, conservation line
- Water checkup appointments
- School programs
- Rebates
- Gardening certifications & classes
- Irrigation budgets

SCV WATER

SERVICE • COMMUNITY • VALUE

Analysis Summary

- ✓ Land use-based forecasts were detailed and prepared with City and County Planning staff
- ✓ Adjustments were needed for more accuracy
  - ✓ Ongoing Monitoring Outdoor Water Use Study
- ✓ Careful accounting of potable and non-potable demands
- ✓ Future updates to unallocated water demand

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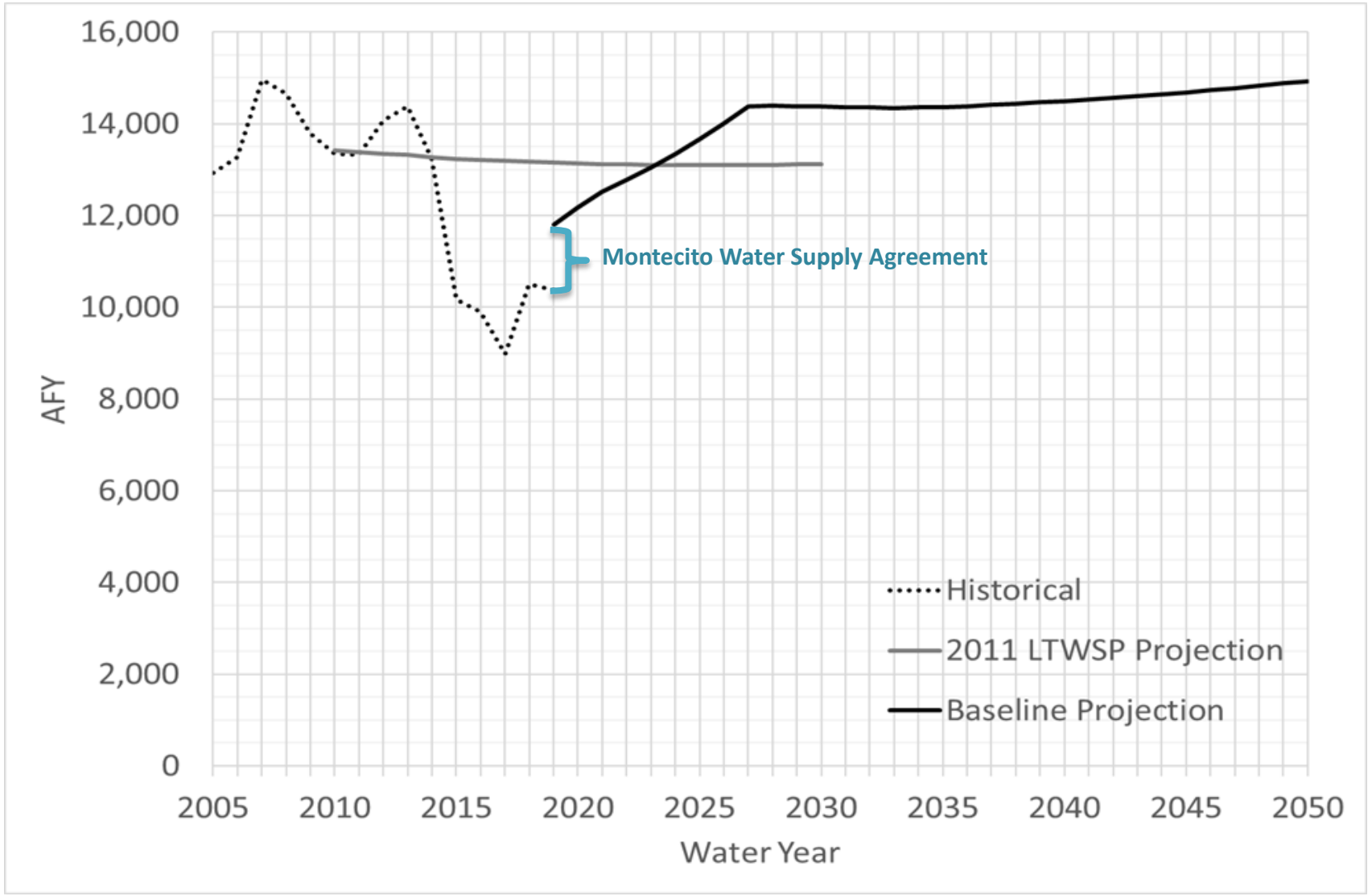
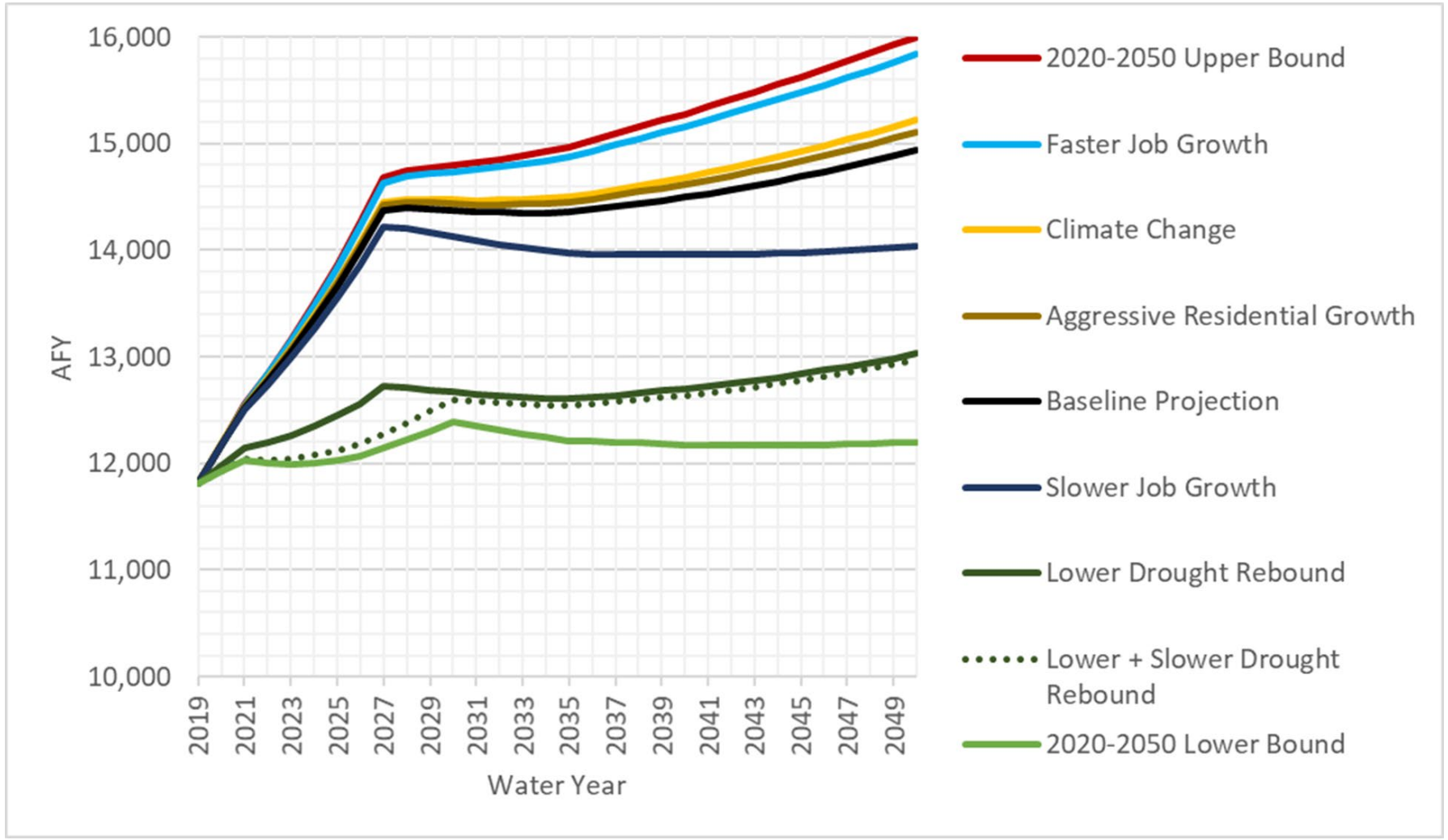
Case Study: City of Santa Barbara, California (pop. 96,000)



ONE WATER
CITY OF SANTA BARBARA

Demand Envelope



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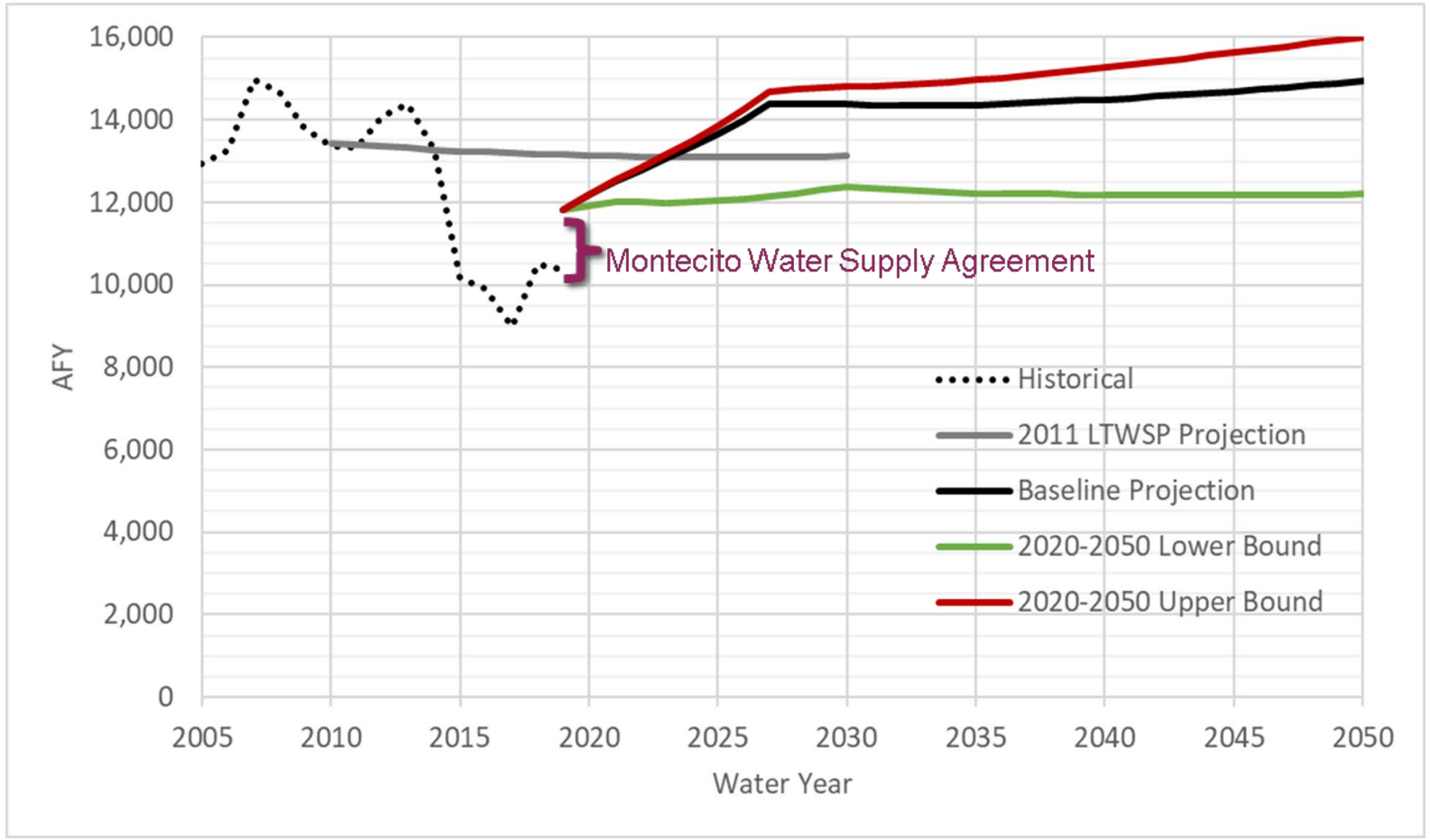
CITY OF SANTA BARBARA

Demand Envelope

Upper Bound Projection:
Combines Higher Residential Growth with Higher Job Growth

Lower Bound Projection:
Combines Lower and Slower Drought Rebound with Slower Job Growth



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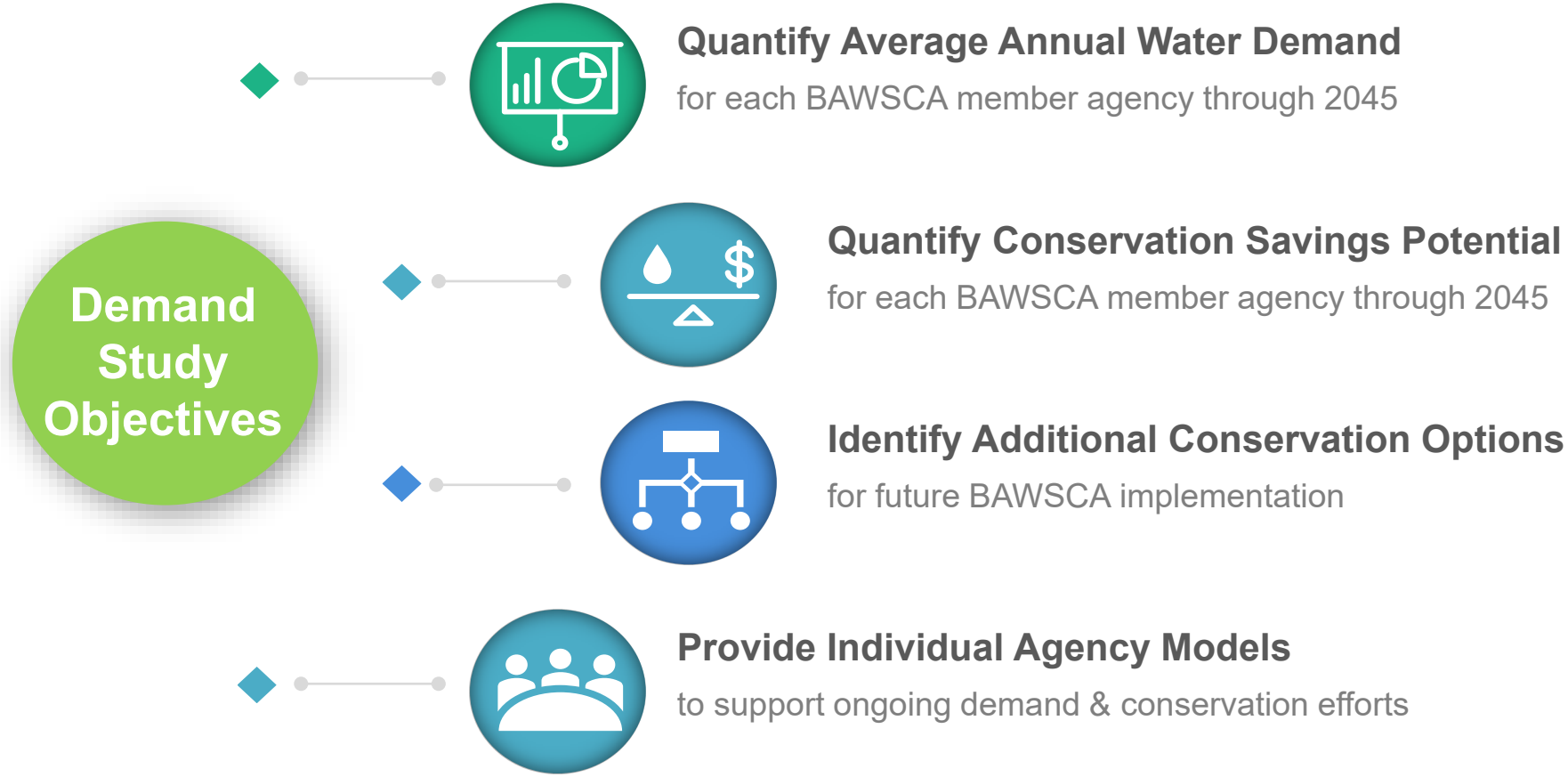
Key Takeaways

- Population growth: low impact (majority of new housing is multifamily)
- Climate change: low impact
- Job growth: medium impact (increased commercial demand)
- Existing customer drought rebound: high impact

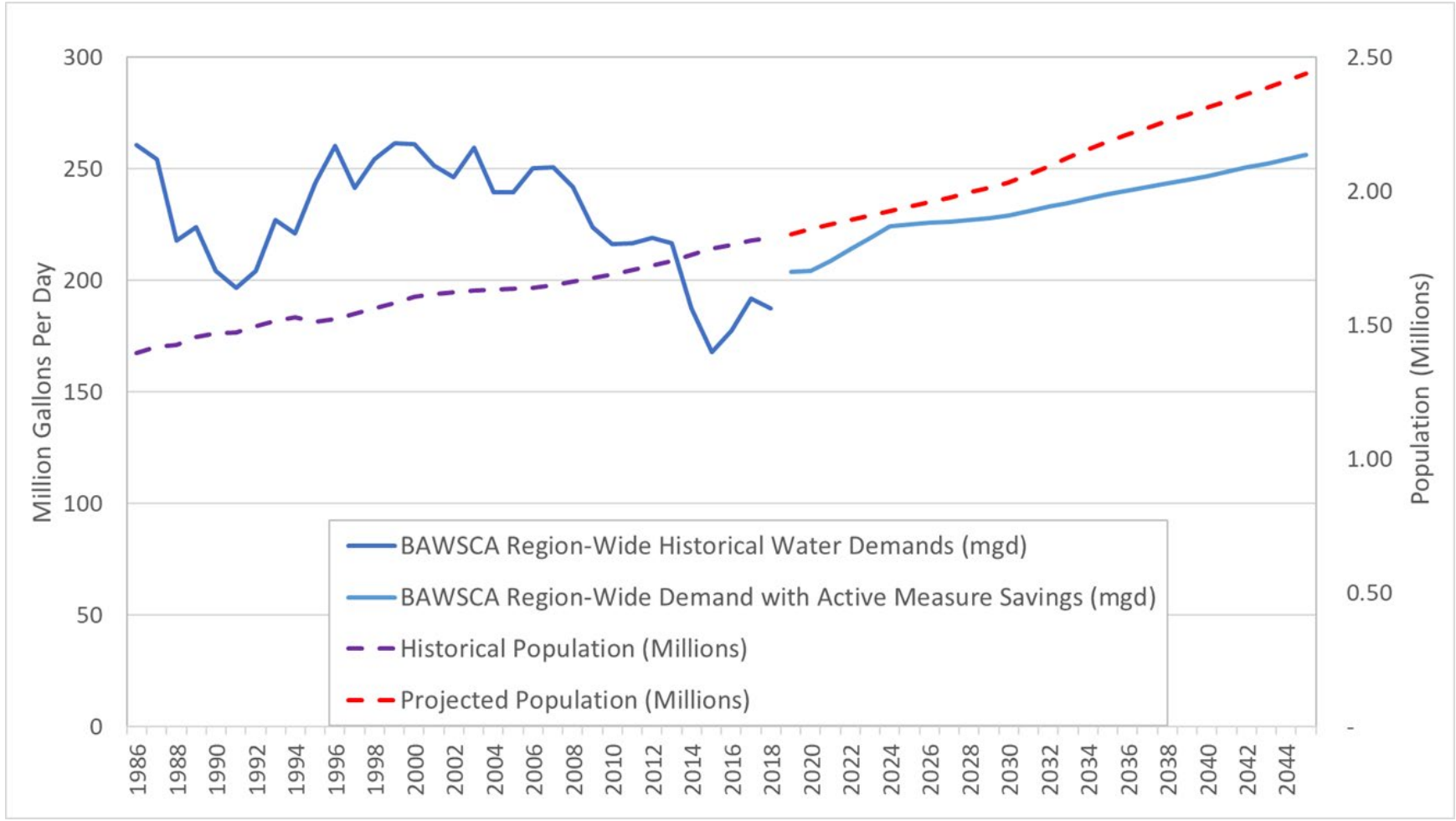
ONE WATER
CITY OF SANTA BARBARA

Case Study: Bay Area Water Supply and Conservation Agency, California (pop. 1.3 Million)



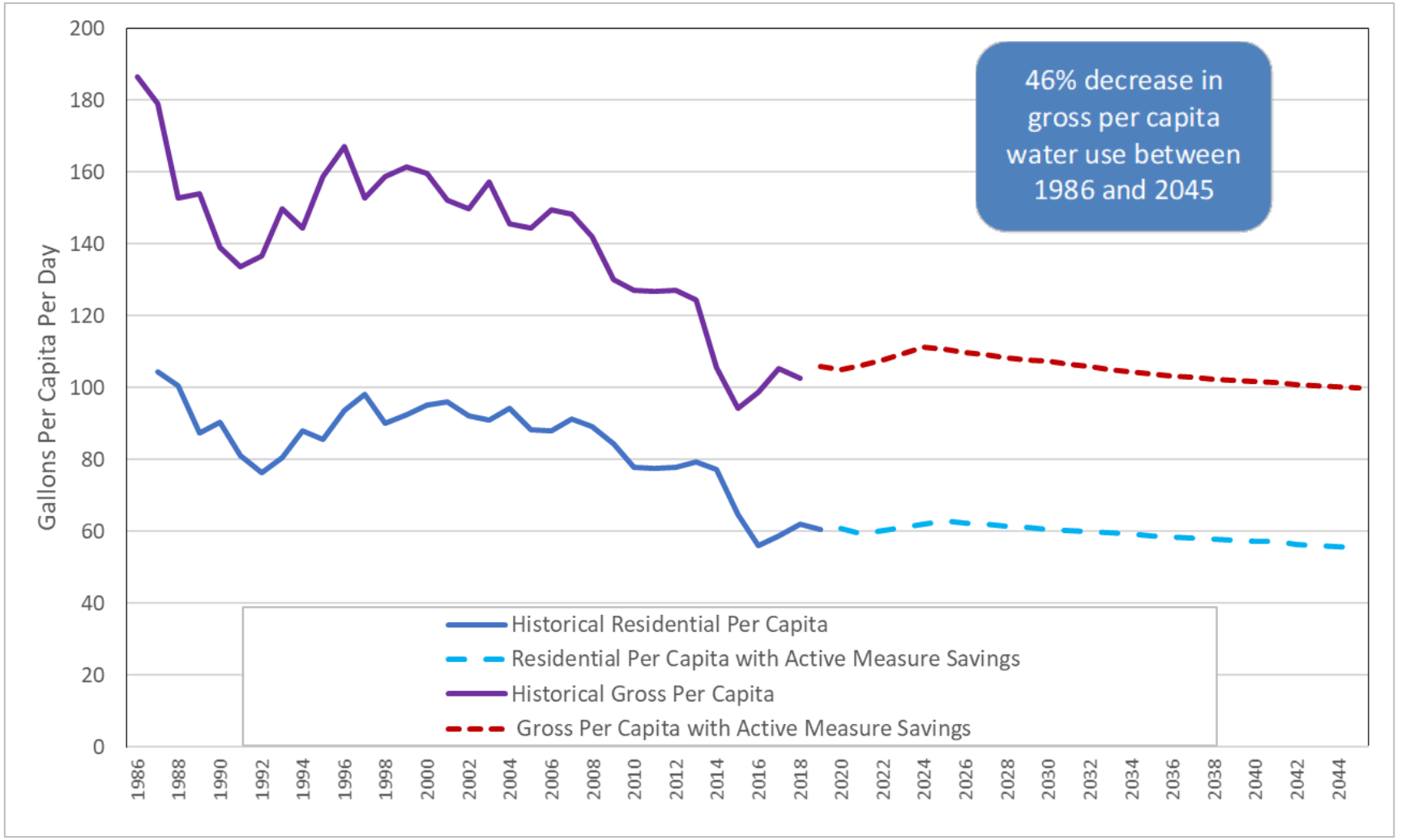
BAWSCA
Bay Area Water Supply & Conservation Agency

Population Will Continue to Grow Faster Than Water Demand



BAWSCA
Bay Area Water Supply & Conservation Agency

Per Capita Use Will Continue to Decline



BAWSCA
Bay Area Water Supply & Conservation Agency

24 Conservation Measures Identified for Potential Implementation

Current Measures

- Large Landscape Surveys & Budgets
- Lawn Be Gone! & Rainwater Rebates
- Residential Device Giveaway
- Public & School Education
- Water Smart Reports (non-AMI)
- AMI Customer Portal
- Water Loss Management

Near-Term Implementation

- CII Water Surveys
- Irrigation Hardware Incentives
- Residential Indoor Surveys
- Flow Meter Rebates
- Leak Repair Assistance

Future Consideration

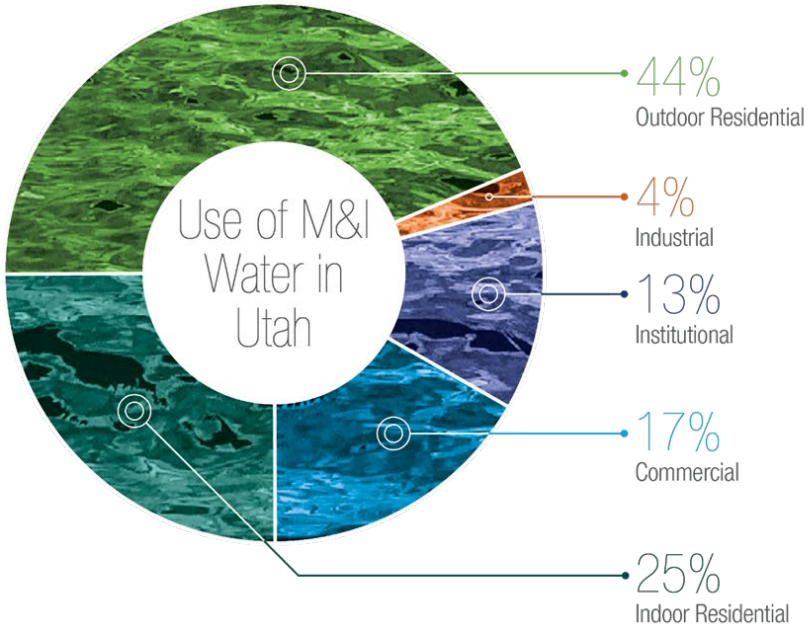
- CII Custom Rebates
- School Retrofits
- Multifamily HET Direct Install
- Multifamily Submetering Retrofits

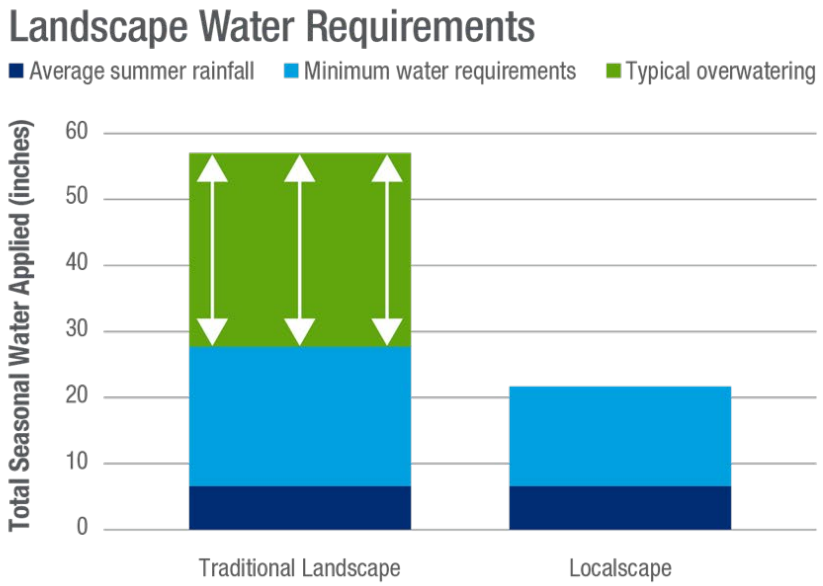
Codes and Ordinances

- Fixture Retrofit on Resale (CII)
- Landscape and Irrigation Codes
- Hot Water on Demand Codes
- Low Impact New Development
- Fixture Rebate on Resale
- Multifamily New Development Submetering

BAWSCA
Bay Area Water Supply & Conservation Agency

Case Study: Central Utah Water Conservancy District (pop. 1.5 Million)





CENTRAL UTAH WATER
CONSERVANCY DISTRICT

District Goals

The stakeholder survey results directly impacted the goals and vision forward.

Vision for Conservation: *Use our limited water resources efficiently to responsibly support our community, now and in the future.*

GOAL
Use District water efficiently

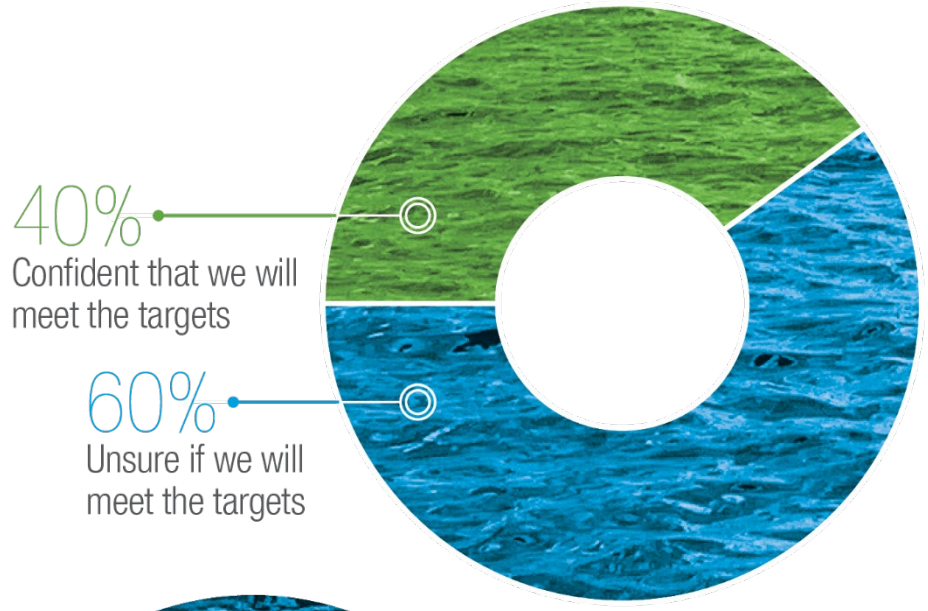
GOAL
Support water retailer's conservation efforts

GOAL
Encourage conservation by the public

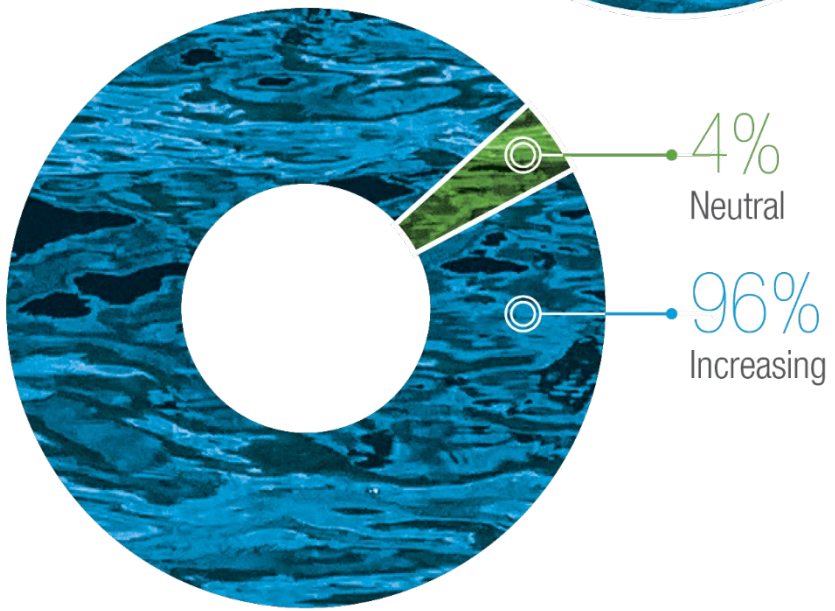
CENTRAL UTAH WATER
CONSERVANCY DISTRICT

Stakeholder Input

How confident are you that your water conservation plan is sufficient to meet the state's new gallons per capita per day (GPCD) targets for your service area?



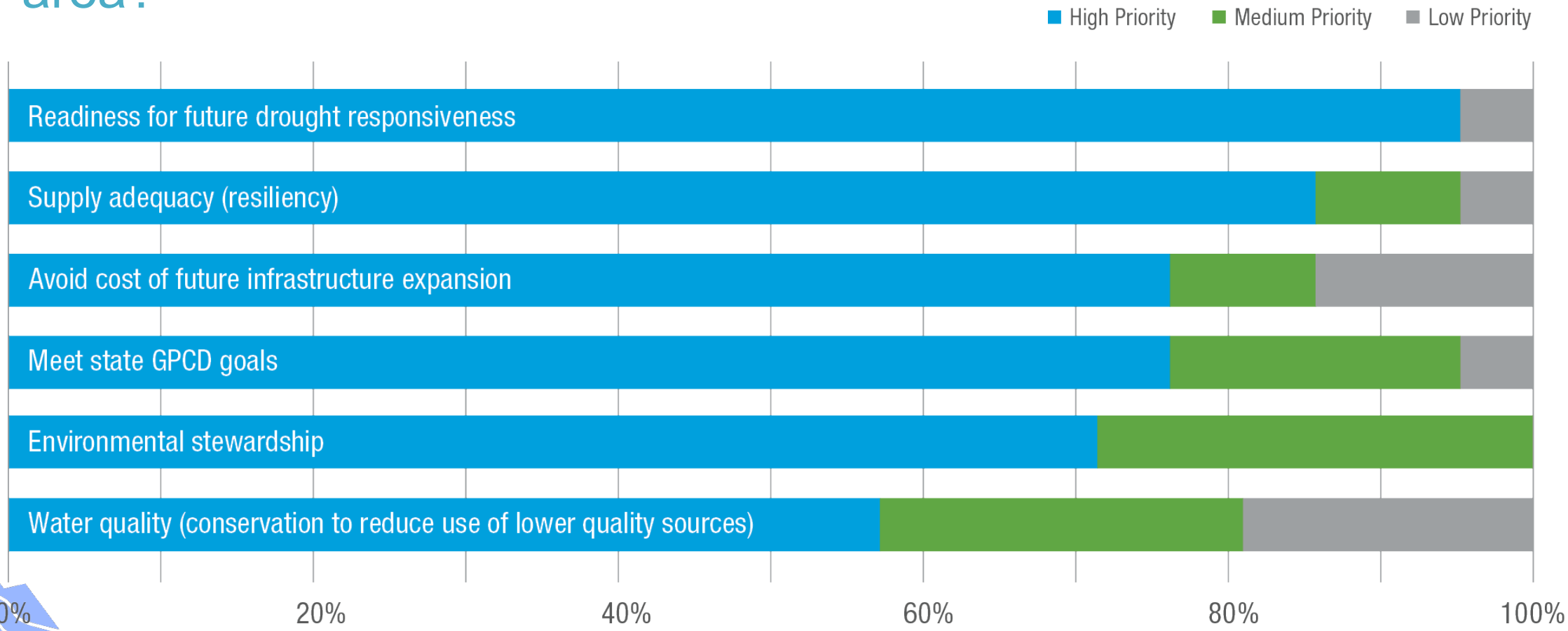
Do you see conservation as increasing or decreasing in importance for your service area? Why?



CENTRAL UTAH WATER CONSERVANCY DISTRICT

Stakeholder Input

What are the current or potential future drivers for conservation in your service area?



CENTRAL UTAH WATER CONSERVANCY DISTRICT

Conservation Programs – Selected Programs

Education

Conservation classes

School education programs

Public outreach/awareness efforts

Water checks/surveys/consultations

Retailer education/training

Incentives

Indoor incentives

Outdoor equipment incentives

Landscape incentives

Grants for utilities and large users

Policy

Policy/legislation

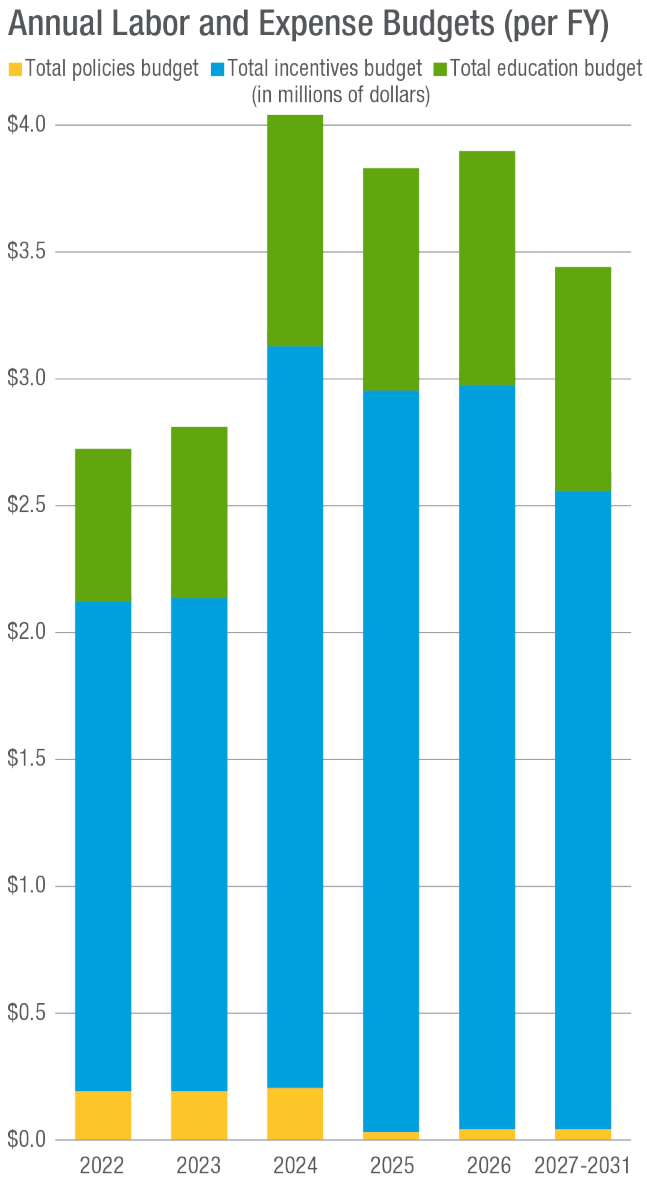
Conservation contracts

CENTRAL UTAH WATER
CONSERVANCY DISTRICT

Conservation Road Map

High-Impact Activities

- Conservation roundtables
- Secondary meter funding
- Water efficiency policies and state legislation
- Water efficiency standards in contracts
- Landscape water requirements calculator



CENTRAL UTAH WATER CONSERVANCY DISTRICT

Conclusion Ways to Find our Shared Vision

- New sophisticated methods needed to deal with fluctuations in water demand and establishing variables for forecasts, particularly the rebound from downturns in demands due to recession and/or drought
- Various factors need to be analyzed in demand forecasting
- End-use modeling for smart conservation programing long-term investments
- Scenario planning inclusive of various climate change, demand conditions and conservation implementation levels is necessary

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Thank You!

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