



Rebecca Coletta, President

Mary Waldron, Executive Director

(508) 583-1833

70 School Street, Brockton, MA 02301

www.oldcolonyplanning.org

**Regional Water Plan
Steering Committee Meeting
MINUTES OF THE MEETING
Monday, May 20, 2024, 9:00am**

Location: Old Colony Planning Council, 70 School St, Brockton, MA 02301

Attendees:

Steering Committee	
Organization	Name
Town of Abington	Liz Shea
Town of Bridgewater	Shane O'Brien
Town of Bridgewater	Greg Tansey
City of Brockton	Pat Hill
CPCWDC	Kimberly Groff (via Zoom)
East Bridgewater	John Haines
Easton Department of Public Works	Greg Swan
EPA	Margherita Pryor (via Zoom)
Town of Kingston	Val Massard
MA Department of Conservation and Recreation	Jason Duff (via Zoom)
MAPC	Martin Pillsbury (via Zoom)
MassDEP	Duane LeVangie
MassDEP	Jon Hobill (via Zoom)
Pembroke Water Department	Dan Sullivan
OCPC	Joanne Zygmunt
Town of Plymouth	Peter Gordon
Town of Plympton	Brian Vasa
Town of Stoughton	Phil McNulty
Watershed Associations	Pine duBois
Watershed Associations	Jimmy Powell (via Zoom)
Town of West Bridgewater	Wayne Parks

Observers	
Organization	Name
SRPEDD	Danica Belknap (via Zoom)
OCPC	Becky Coletta (via Zoom)
OCPC	Bill Napolitano (via Zoom)
Cape Cod Cranberry Growers' Association	Brian Wick

Consultants	
Organization	Name
CDM Smith	Grace Houghton (via Zoom)
CDM Smith	Kirk Westphal
CDM Smith	Amara Regehr
CDM Smith	Grace Inman
CDM Smith	Kara Rozycki
Regina Villa Associates	Kyle Olsen (via Zoom)
Alliance for Water Efficiency	Andrew Morris

Minutes:

1. Call to Order, introductions
 - a. New attendees: Brian Wick (Cape Cod Cranberry Growers' Association), Andrew Morris (Consultant, Alliance for Water Efficiency), Grace Houghton (Consultant, CDM Smith), Brian Shepherd (Consultant, CDM Smith)
2. Public Comment – none
3. Technical Work
 - a. Public Outreach ongoing. Interviews being conducted by RVA. Reminders coming from Kyle Olsen of RVA to town officials and steering committee members.
 - b. Annotated Bibliography Draft complete, team completing updates
 - c. Water availability models for Taunton and South Coastal Watersheds ongoing
 - d. Demand analysis ongoing
 - e. Water efficiency ongoing
 - f. Future climate conditions upcoming
 - g. Alternatives upcoming
4. Definitions
 - a. Discussion of EJ vs. EJ population
5. Metrics Finalization

- a. Request to remove “local needs” from “supply volume beyond local needs”
 - b. Request to define “gap” as a unit
 - c. Request to remove “or” from “quantity and quality of natural waters”
 - d. Request to define quantity using DEP sub-basin quantity
 - e. net export of water from its original aquifer
 - f. Incorporate undocumented immigrant populations and major prisons into equity metrics.
 - g. MetroWest Climate Equity Project includes equity information (Shane to distribute)
 - h. Newspaper article over the weekend includes MBTA proposed projects
 - i. Metrics and updates to be distributed to group via email
 - j. Fisheries information available
6. Alliance for Water Efficiency
- a. Presentation provided by Andrew Morris from Alliance for Water Efficiency
 - b. Discussion:
 - i. DEP requires AWWA M36 model if UAW 10% is not met. Grants are available in August.
 - ii. Discussion of water bans and charging more for irrigation, which would require an irrigation meter.
 - iii. Discussion of multi-family units.
 - iv. Conservation rate structure grant from DEP also available in August.
 - v. Breakout groups on efficiency
 - vi. Feasibility of public/leadership/political acceptance to be considered as a metric
7. Introduction to Demand Projections
- a. Presentation provided by Brian Shepard from CDM Smith introducing how demand is calculated.
 - b. To be continued at next workshop, along with alternatives introductions.
8. Next Workshop
- a. 6/25/2024

Action Items:

Assigned to	Action Item
Steering Committee members	Review annotated bibliographies and respond to interview requests
CDM Smith	Update metrics and distribute to steering committee

Attachments:

1. Meeting Presentation Slides

Prepared by CDM Smith.

Old Colony Planning Council Regional Water Plan

Workshop 3
Economic Resilience and Sustainable Water Supply

Kirk Westphal, Kara Rozycki, Tarun Gill,
Andrew Morris, Brian Shepard,
and Amara Regehr
May 20, 2024

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Agenda

1. Public Comment
2. Overview of Technical Work
3. Definitions
4. Metrics Finalization Discussion
- ☕ Coffee Break
5. Water Efficiency
6. Alternatives Introduction
7. Demand Projections Introduction
8. Next Workshop

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Public Comment



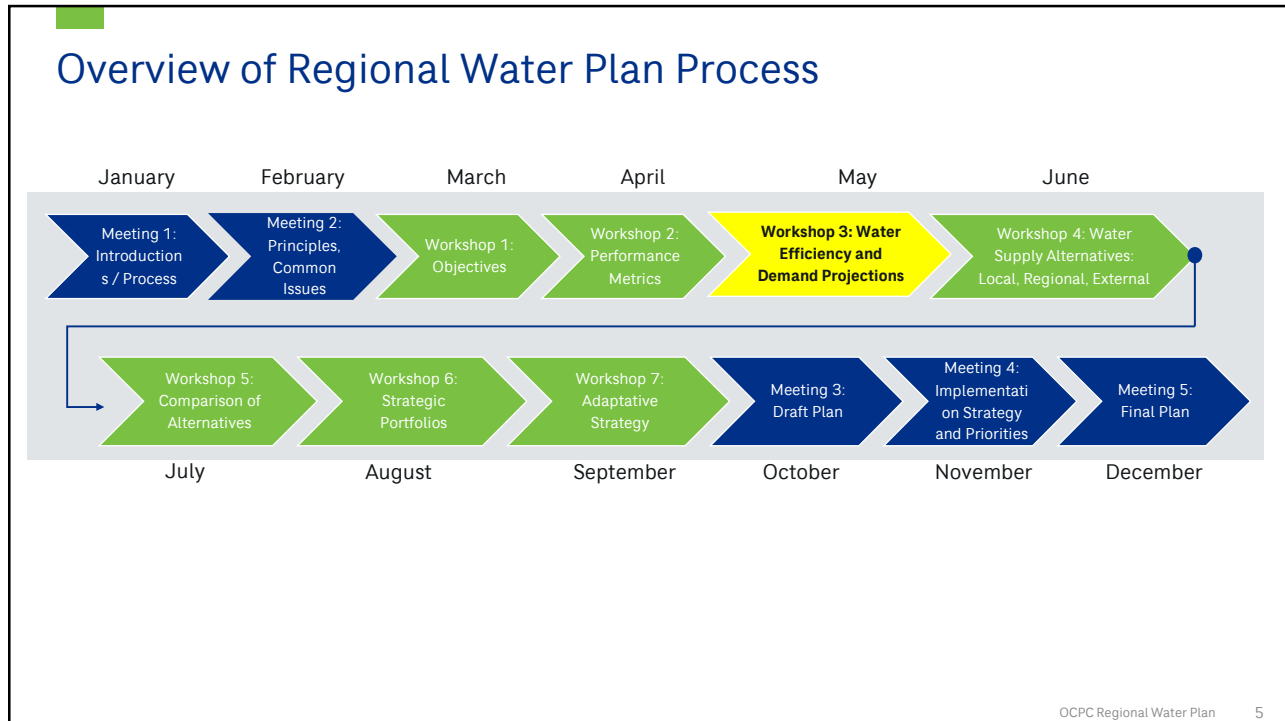
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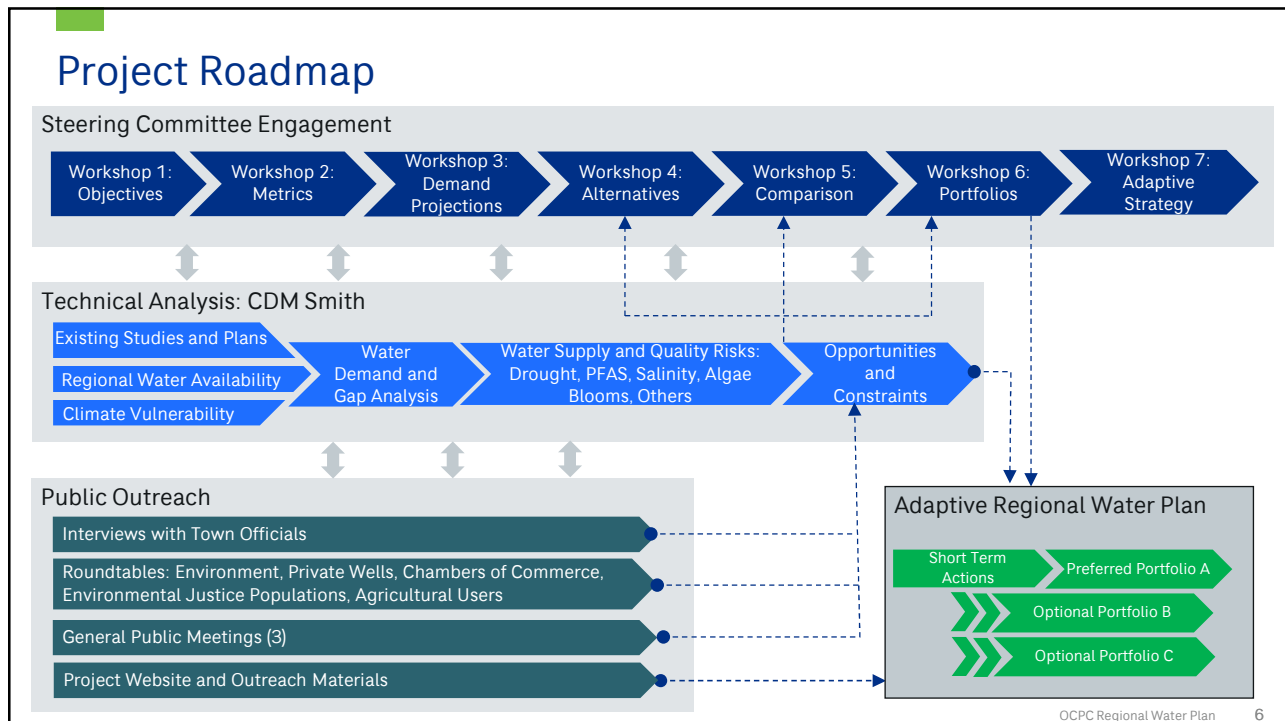
Overview of Technical Work



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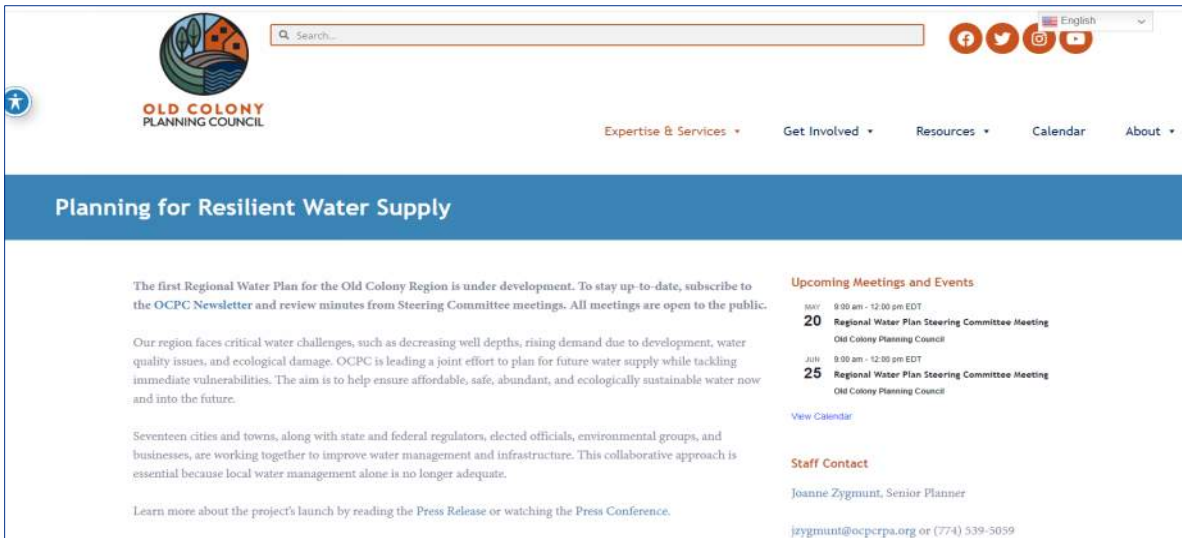


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Project Website

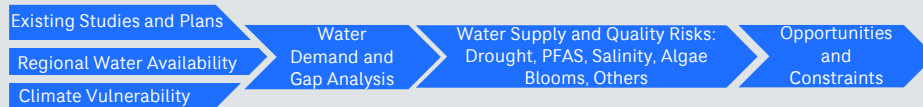


<https://oldcolonyplanning.org/waterplan/>

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Technical Work

Technical Analysis: CDM Smith



→ Annotated Bibliography Draft (complete)

- Updates from communities (ongoing)

→ Water availability models for Taunton and South Coastal Watersheds

- Accounts for both surface and groundwater availability based on USGS data
- Can be used to model future climate conditions based off projections for temperature and precipitation

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Technical Work

Technical Analysis: CDM Smith



Discuss Today

- Introduction to the demand analysis conducted by CDM Smith
- Water efficiency by Alliance for Water Efficiency

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Technical Work

Technical Analysis: CDM Smith



Upcoming technical work

- Work with Professor Casey Brown of UMass Amherst to understand future climate conditions and impacts to water quality and water quantity

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Technical Work

Technical Analysis: CDM Smith



Ongoing: CDM Smith to support the development of alternatives with creation of figures, high level costs, and other pieces to support future implementation

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Definitions



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Definitions of Terms for Strategic Planning



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Terms used in our Guiding Principles

- Recommend **sustainable** water supply strategies that balance social, environmental, and economic needs for the region.
- Align with values of good stewardship and wise use of water.
- Reflect the limits of our natural resources and current/anticipated regulations.
- Incorporate uncertainties so implementation of recommendations can adapt over time.
- Strive for **environmental justice and equity and social justice** within and among the communities.
- Produce a list of “early-win” projects that can be aligned with available outside funding.

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Terms used in our Objectives

- Meet all current and future peak water demands with **climate resilient** supply side and demand side strategies.
- Meet safe drinking water quality regulations, current and future.
- Improve ecosystem health.
- Prioritize alternatives with high cost-benefit value.
- Promote **environmental justice and equity between communities** by incorporating **affordability, accessibility, and distribution of infrastructure impacts**.
- Consider innovative and alternative solutions such as stormwater capture, wastewater reuse and water use efficiency.
- Encourage **sustainable** potential for housing, economic development and prosperity.

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Definitions of Highlighted Terms

Highlighted Term	Definition	Source
Sustainability	In practice, sustainability refers to efforts to align economic development with environmental protection and human well-being. Sustainability is commonly characterized in terms of the interdependence among three broad dimensions—environment, economy, and society—while considering both present and future generations.	United States EPA
Equity	Equity is defined as being fair and impartial, and providing what each group needs so they can experience fair and equitable treatment.	Massachusetts Office of Diversity and Equal Opportunity
Environmental Justice	Based on the principle that all people have a right to be protected from environmental hazards and to live in and enjoy a clean and healthful environment regardless of race, color, national origin, income, or English language proficiency. Environmental justice is the equal protection and meaningful involvement of all people and communities with respect to the development, implementation, and enforcement of energy, climate change, and environmental laws, regulations, and policies and the equitable distribution of energy and environmental benefits and burdens.	Massachusetts Municipal Vulnerability Preparedness (MVP) Program

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Definitions of Highlighted Terms

Highlighted Term	Definition	Source
Climate Resilience	The ability of a community to address the needs of its built, social, and natural environment in order to anticipate, cope with, and rebound stronger from events and trends related to climate change hazards, including temperature changes, extreme weather, sea level rise, coastal and inland flooding, changes in precipitation, and other impacts.	Massachusetts MVP Program

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Metrics Finalization Discussion

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A		B		C		D (hybrid)	
Objectives		Objectives		Objectives		Objectives	
Meet all current and future peak water demands with climate resilient supply side and demand side strategies.		Promote equity by incorporating affordability, accessibility, and distribution of infrastructure impacts.		Consider innovative and alternative solutions such as stormwater capture, wastewater reuse, and water use efficiency.		Encourage sustainable water use to meet the needs for housing and economic prosperity.	
Improve ecosystem health.		Meet current and future safe drinking water quality.		Prioritize alternatives with high cost-benefit value.			
People		People		People		People	
Pine DuBois		Jason Duff		Jonathan Beder		Peter Forman	
John Haines		Kimberly Groff		Peter Gordon		Jon Hobill	
Bob Kostka		Shane O'Brien		Duane LaVangie		Gavin Murphy	
Kendra Martin		Noreen O'Toole		Phil McNulty		Jimmy Powell	
Val Massard		Wayne Parks		Greg Tansey		Brian Vasa	
Liz Shea		Greg Swan		Bill and Grace		Art Edgerton	
Dan Sullivan		Brian Vasa				Martin Pillsbury	
Kirk		Amara				Margherita Prior	
						Joanne and Kara	

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Metrics Finalization

- CDM Smith used input from the April steering committee meeting to develop meaningful metrics for this region
- The steering committee will review the draft metrics today
- The steering committee can revisit these metrics prior to their application later in July/August as needed

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Refinement of Metrics

- Group A:**
 - Meet all current and future peak water demands with climate resilient supply side and demand side strategies
 - Only focus for the region
 - Resilient to be defined
 - Objectives:
 - Groundwater
 - Streamflow
 - Connectivity
 - Fish and wildlife
 - Wetland
 - Water quality
 - Water quantity
 - Water temperature
 - Water trends
 - Regional
- Group B:**
 - Objective 1: Ph...
 - Equal access
 - Impacts of...
 - Affordability
 - Potentially...
 - Difference t...
 - If there are...
 - Potential to...
 - Potentially...
 - Try to ensur...
 - Consider th...
- Group C:**
 - Consider innov...
 - Consensus t...
 - RGPCD is a r...
 - UAW is a me...
 - Seasonal wa...
 - Nonessential...
 - Cost of solu...
 - Ranking effi...
 - Stormwater
- Group C:**
 - High cost benefit valu...
 - Efficiency would be...
 - Potential benefits fr...
 - Wastewater reuse is...
 - Potential metric \$/...
 - uses
- Group D:**
 - Objective: Encourage sustainable water use to meet the needs for housing and economic prosperity
 - One metric for private well households: permitting for well re-digging. Track this on a regional scale to understand if there is no longer sustainable water supply
 - Another metric: additional water supply potential for economic development
 - May have limited data availability for this, would require measuring groundwater levels and surface water levels.
 - Ideas came up about how to incorporate recommendations for final water plan
 - Look at per capita water use- good indicator for if there is additional water
 - Unaccounted for water (UAW)- trends for this
 - Housing density efficiencies for water use - no specific metric mentioned
 - Conserved land that is left for water recharge
 - Public private partnerships
 - Peak demand may not be a good metric to understand "cushion" for economic development
 - High cost of water as a consideration for reclaimed water
 - Drought restrictions could be an indicator for some communities while others go under drought restrictions every year so would not be a useful

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Decision Framework

Objective	Metric	Units (or qualitative)
Meet all current and future peak water demands with climate resilient supply side and demand side strategies	Amount of regional supply gap filled (seasonal peak)	% of gap
	Supply volume beyond local needs	% of gap
Improve ecosystem health	Connectivity of natural waters	Qualitative
	Quantity and/or quality of natural waters	Qualitative
High Benefit: Cost value	Volume of supply gap reduced per unit cost	MG/\$M
Consider innovative and alternative solutions such as stormwater capture, wastewater reuse and water use efficiency	Water supply- volume of supply that is considered innovative	MG
	Water efficiency- volume of demand decreased	MG
Promote environmental justice and equity between communities	Percent of MA designated EJ census tracts served by alternative	% of census tracts
	Percent of MA designated EJ census tracts not impacted by construction	% of census tracts
Meet current and future drinking water quality standards	Total supply vulnerable to salinity/PFAS, etc.	% of total new supply
Encourage sustainable water use to meet the needs for housing and economic prosperity	Flexibility in phasing and supply capacity	Qualitative

More info on following slides

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Objective: Encourage sustainable water use to meet the needs for housing and economic prosperity

Objective	Metric	Units (or qualitative)	Qualitative Scales		
			1	2	3
Encourage sustainable water use to meet the needs for housing and economic prosperity	Flexibility in phasing and supply capacity	Qualitative	Low flexibility in time or volume	High flexibility in time or volume	Fully able to meet anticipated future needs

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Future updates to metrics

- Opportunities to update metrics later in the process
- We will be conducting roundtable discussions with:
 - Private well users
 - Environmental groups
 - Chambers of commerce
 - Environmental justice communities
 - Cranberry growers



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Coffee Break



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Water Efficiency – Alliance for Water Efficiency



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The Alliance for Water Efficiency is a stakeholder-based nonprofit organization dedicated to the efficient and sustainable use of water.

Collaboration: Network of colleagues across water providers, governments, business and industry, researchers, nonprofits and other partners.

Knowledge: Creating and sharing resources, tools, trainings, expertise and research.

Change: Advocacy for funding, policies, and partnerships that advance water efficiency.

Learn more: www.a4we.org

Alliance for Water Efficiency

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About The Process

Process for developing preliminary recommendations:

1. Reviewed the annotated bibliography CDM prepared
2. Reviewed water data from OCPC communities
3. Reviewed state laws, plans, and standards
4. Reviewed water rates and structures from OCPC communities
5. Reviewed several OCPC regional plans
6. Compared regional efforts to other regions in the Eastern U.S. and beyond
7. Compared regional efforts to American Water Works Association G480-20 Standard for Water Conservation and Efficiency Program Operation and Management

My Background: 15 years experience working for utilities on law, policy, and planning. Major focus areas include developing supplies and implementing demand-side alternatives. Experience in the private, public, and nonprofit sectors. Certified utility water loss validator and trainer in Georgia, one of the two leading states for water loss. Education: JD from University of Notre Dame; BA from the University of Georgia.

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Let's Start with an Icebreaker

When I say water efficiency, what words come to mind?



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Focus for Today – Water efficiency recommendations for long-term demand reductions

Broader Analysis to Come – Written report that will also cover:

1. Advanced approaches to water efficiency
2. Drought planning and response
3. Efficiency and Affordability
4. Public Education
5. Passive Water Efficiency: State and Federal Codes and Standards

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Water Efficiency and Conservation: Important Even When Water is Abundant

Alliance for Water Efficiency

Water efficiency and conservation are typically the fastest and least expensive ways to help ensure that communities and agriculture have access to affordable, sustainable water supplies. Climate change is leading to hotter, drier weather, and nearly every state experienced drought in 2022, which was the worst drought in hundreds of years in the Western U.S.

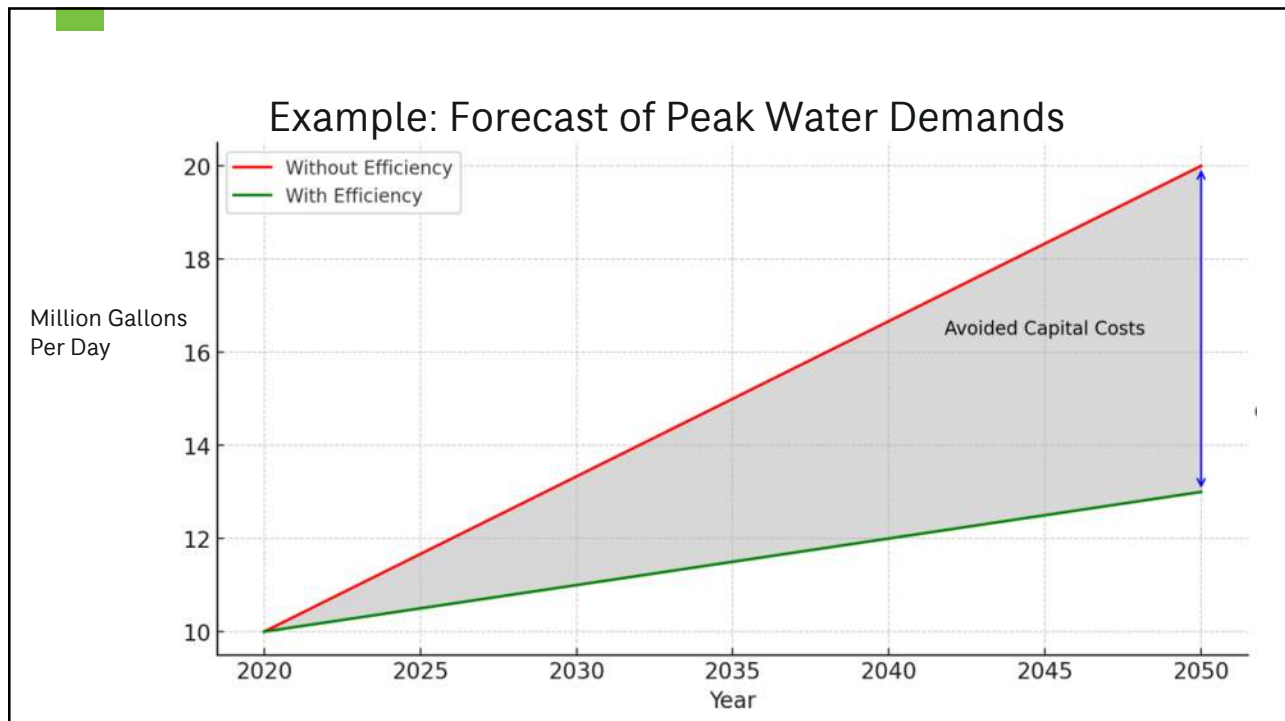
However, water efficiency and conservation offer multiple sustainability benefits beyond keeping the water running, just as energy efficiency does more than keep the lights on. It's time to de-bunk the common misperception that water efficiency and conservation are only important in arid regions or when drought sets in.

A brief overview of water efficiency and conservation's other benefits:

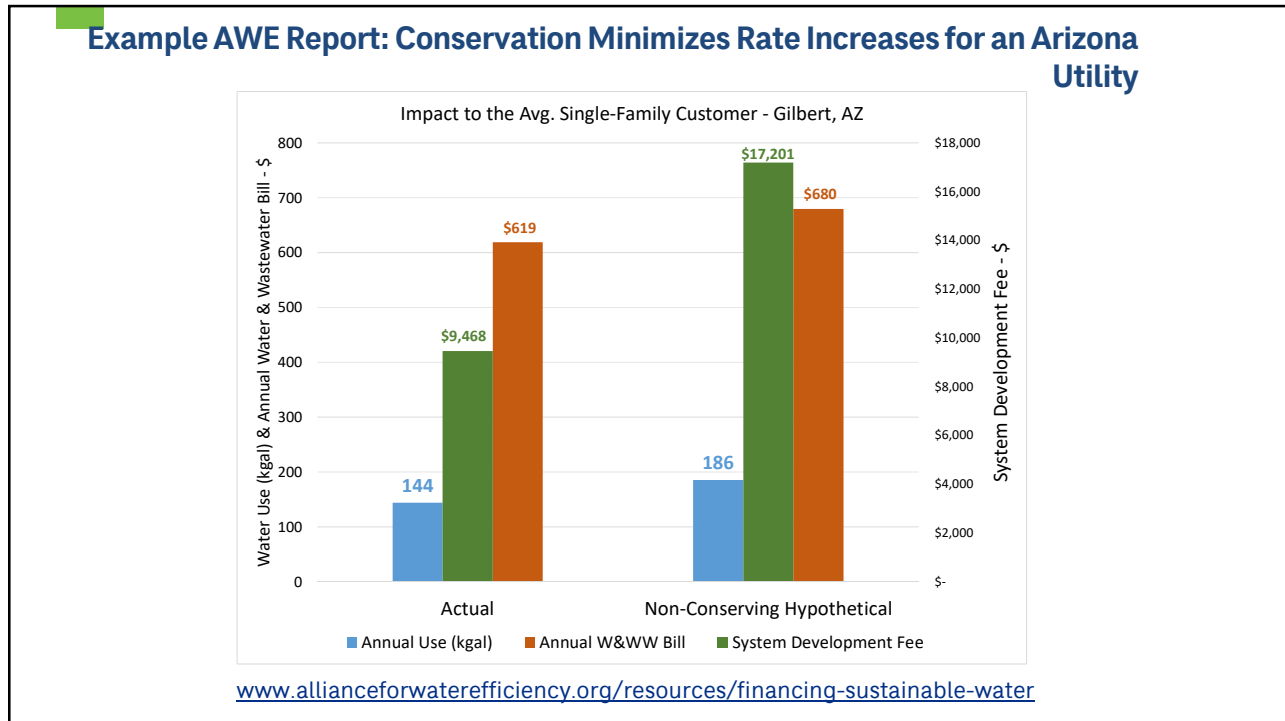
- Mitigating climate change** by reducing energy use and greenhouse gas emissions associated with heating, pumping, and treating water/wastewater.
- Adapting to climate change** by making communities more resilient to drought and heavy rain events.
- Reducing costs for businesses** and supporting corporate sustainability goals.
- Making more water available** to support healthy stream flows and lake levels for plants and animals.
- Reducing the need to build or expand expensive drinking water and wastewater systems.**
- Limiting nutrient runoff** associated with landscape and agriculture.
- Helping communities manage water shortages** related to water quality problems.
- Using technologies** that detect leaks to save water and help prevent property damage.
- Making water bills more affordable.**
- Minimizing land subsidence** linked to excess groundwater withdrawals.

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- ### Preliminary recommendations for long-term demand reductions
1. Conduct, Validate, and Act on Annual American Water Works Association (AWWA) Water Loss Audits
 2. Adopt Advanced Metering Infrastructure and Monthly Billing
 3. Implement Customer-Side Leak Detection Programs
 4. Improve Increasing Block Rate Designs

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Preliminary Recommendation #1:

Conduct, Validate, and act on
AWWA Water loss audits

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Unaccounted for water Methodology in Massachusetts

Water Treated *minus*
Metered Water Use *minus*
Confidential Estimated Municipal Use =
Unaccounted For Water

Unaccounted for water includes, among other things, physical leaks in the water utility's distribution system; **reducing leaks is an alternative to increasing supplies**

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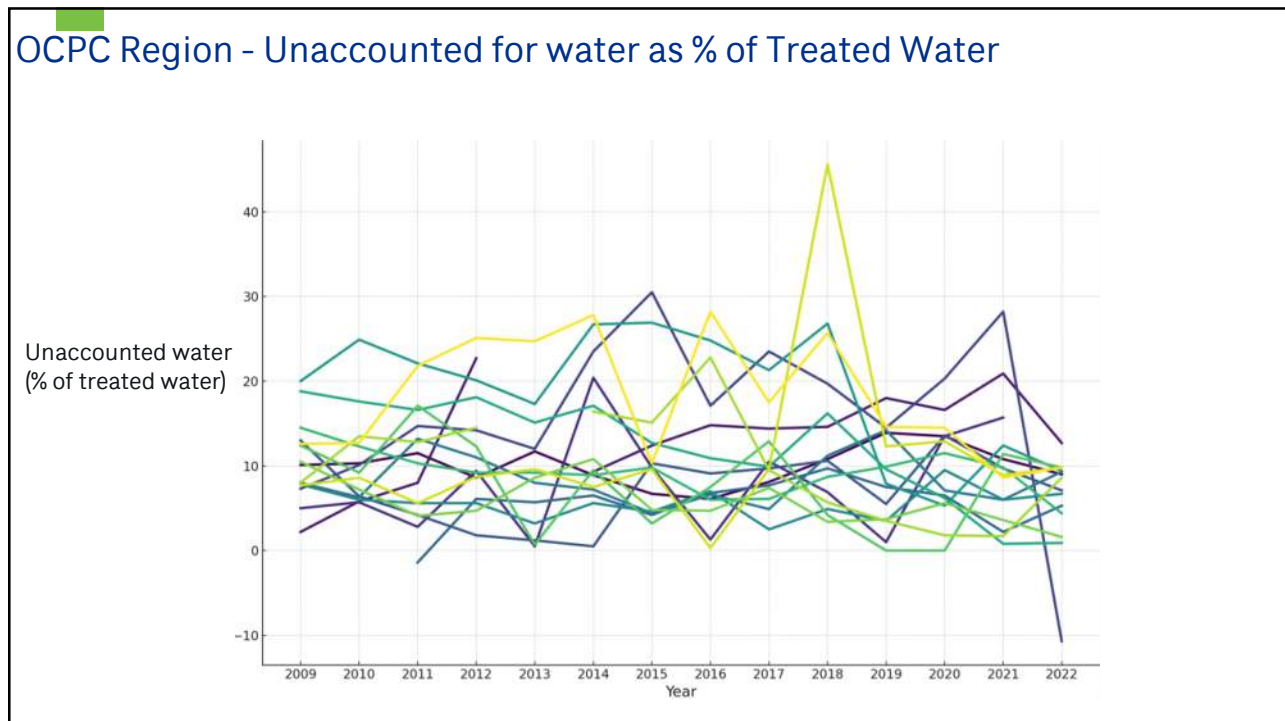
Confidently Estimated Municipal Use (CEMU)	Estimated million gallons per year
Fire protection & training	<input type="text" value="0.25"/>
Hydrant/water main flushing/main construction	+ <input type="text" value="4.15"/>
Flow testing	+ <input type="text" value="0.1"/>
Bleeders/ Blow offs	+ <input type="text" value="0"/>
Tank overflow & drainage	+ <input type="text" value="2.5"/>
Sewer & stormwater system flushing	+ <input type="text" value="0.02"/>
Street cleaning	+ <input type="text" value="0.05"/>
Source meter calibration adjustments	+ <input type="text" value="0"/>
Major water main breaks (not leak detection)	+ <input type="text" value="0.5"/>
Total Confidently Estimated Municipal Use	= <input type="text" value="7.57"/>

ReCalculate Total

YOU MUST PROVIDE DOCUMENTATION FOR ALL OF YOUR CEMU VOLUMES.

Source: Massachusetts Department of Environmental Protection Drinking Water Program Instructions for the Annual Statistical Report

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Water Loss – Preliminary Recommendations

Each year water systems could:

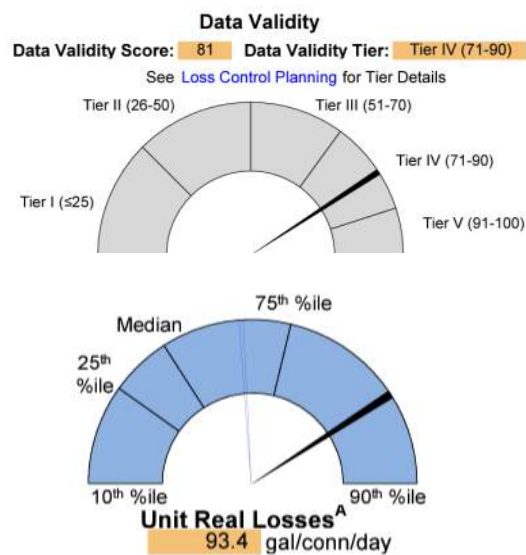
- Conduct water loss audit using AWWA M36 manual and free water loss audit software
- Validate water loss audits using a third-party trained to conduct Level 1 validations pursuant to Water Research Foundation project #5057
- Act on the results by improving data grades and reducing real water losses

Potential demand reductions: Based on study of data from CA, GA, TN and TX, the median utility studied could cost effectively **reduce real water losses by more than 1/3rd**; however, reductions vary based on utility-specific factors

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3 benefits of awwa methodology

1. Provides data validity grades
2. Generates actionable recommendations
3. Relies on metered data and validated industry ranges; limited use of estimates



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Water Loss – Regional recommendation

OCPD or another regional entity could coordinate and assist with grant applications for multiple interested communities in the region and then host regional training.



NOTICE: REQUEST FOR INTEREST

STATEWIDE WATER MANAGEMENT ACT PERMIT AND REGISTRATION HOLDERS

WATER AUDIT

RFI # BWR 2024-AWWA-M36-WATER AUDITS

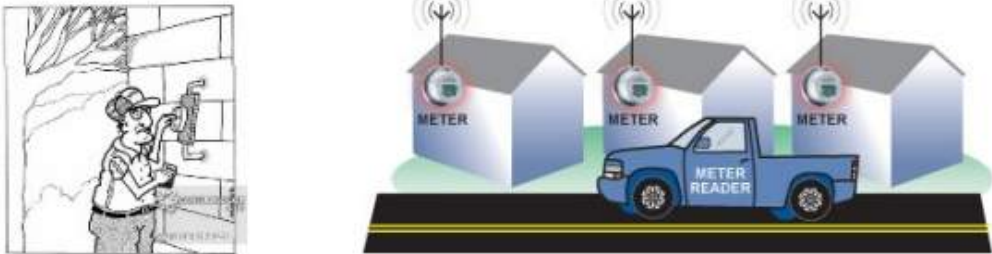
<https://www.mass.gov/doc/m36-water-audit-opportunity-notice-fy2024/download>

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Preliminary Recommendation #2:

implement Advanced metering infrastructure (AMI) & monthly billing

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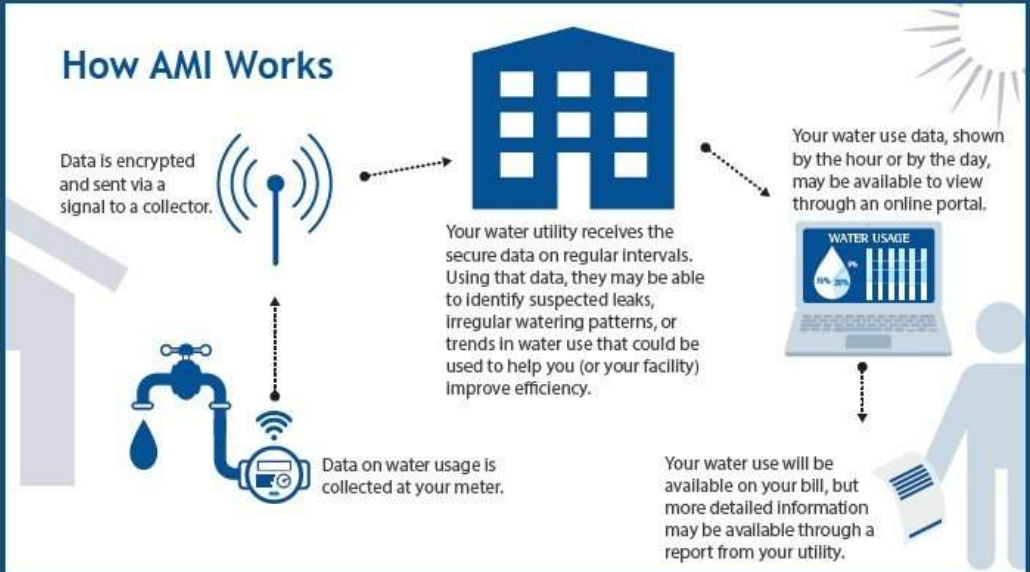


Manual Reading **AMR**

AMR = Automated Meter Reading

Source: Presentation by Suez to AWWA Section on April 28, 2022 [“Advanced Metering Infrastructure \(AMI\) Is It Now Within Reach for Small to Mid-Sized Utilities?”](#)

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How AMI Works

Data on water usage is collected at your meter.

Data is encrypted and sent via a signal to a collector.

Your water utility receives the secure data on regular intervals. Using that data, they may be able to identify suspected leaks, irregular watering patterns, or trends in water use that could be used to help you (or your facility) improve efficiency.

Your water use data, shown by the hour or by the day, may be available to view through an online portal.

Your water use will be available on your bill, but more detailed information may be available through a report from your utility.

Source: www.epa.gov/watersense/advanced-metering-infrastructure

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Metering and billing - Status quo in OCPC Region

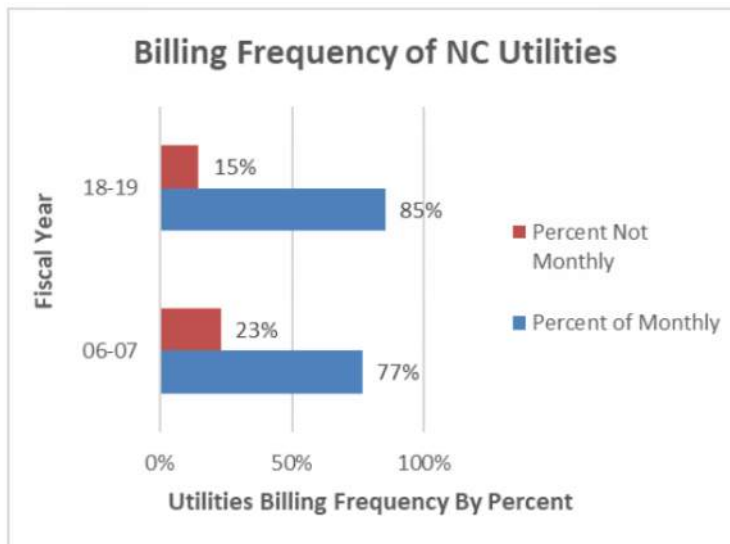
Current meter types – Predominantly manual reading and AMR (automated meter reading)

Infrequent Billing – Bimonthly, quarterly, semiannually + ~10 to 30+ days from time meter is read until bills are sent

Impacts on Water Use – customers may be unaware of customer-side leaks for a very long time; limits customer feedback on water usage; limits utility’s ability to understand usage during peak months

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Example of billing practices from NC



Source: <https://efc.web.unc.edu/2020/05/07/does-how-often-you-pay-for-it-matter-the-impacts-of-billing-frequency/>

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Metering and billing – Preliminary recommendations

Adopt AMI – Adopt advanced metering infrastructure by creating a plan to install AMI meters and related infrastructure for most customer meters (can be phased)

Adopt Monthly Billing – Begin issuing monthly bills (possible even before/without AMI)

Potential demand reductions: AMI metering and monthly billing are best practices; they are necessary building blocks for improved water loss auditing, customer-side leak detection, and improved inclining block rates

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Benefits of AMI



Multiple Benefits

- Improves revenue forecasting
- Reduces bill adjustments
- Improves rate design
- Enables other smart monitoring (e.g. pressure monitoring, leak detection)
- Improves theft detection
- Supports customer service
- Reduces meter reading costs

www.awwa.org/Portals/0/AWWA/ETS/Resources/Technical%20Reports/ami_guidebook_feb_2022.pdf

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Metering and billing – Implementation

**Learn More by
Joining AWE's
Conservation and
AMI Users Group
(CAMI)***

**TEMPLATE FOR AN
ADVANCED METERING INFRASTRUCTURE SYSTEM
REQUEST FOR PROPOSALS**

*CAMI is currently free and open to all



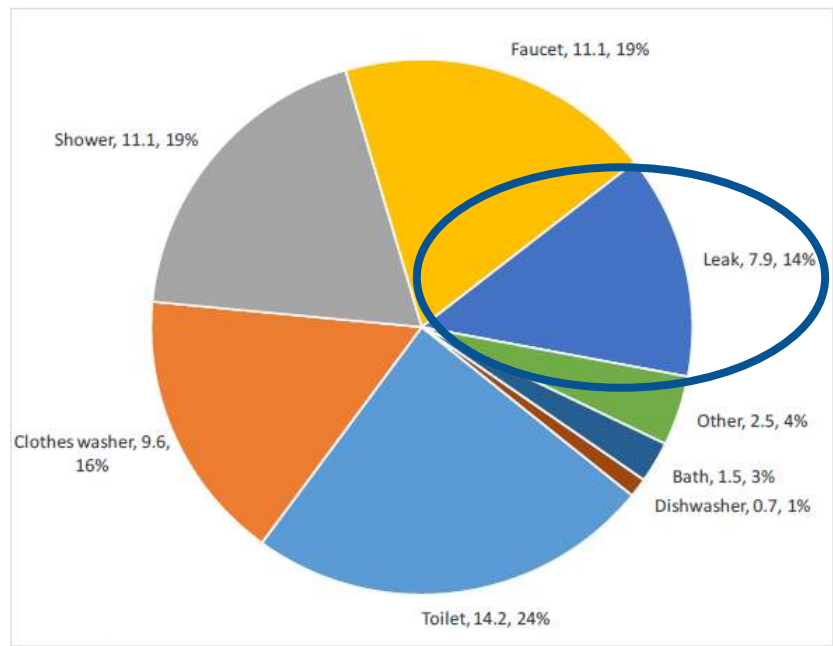
Note – AWE member only resource

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**Preliminary Recommendation #3:
implement customer-side leak detection
programs**

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Customer-Side leak detection - Status quo



Source: Residential End Uses of Water Version 2, 2016 (WRF Project No. 4309)

Figure ES.4 Indoor per capita use (gpcd and percent of indoor use) by fixture, 9 study sites, n=737

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Customer-side leak detection – Preliminary recommendations

AMI-Based Programs

- Utility periodically sends constant consumption reports; can be automated with AMI interface
- Offer customer-facing portal; customers set constant consumption thresholds

In the first three months of the program, the WaterSmart platform delivered over 150 leak alerts to Park City residents, 70% of which were closed within ten days of the notification.



Rebate Programs – Offer a rebate for behind the meter leak detectors



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Customer-Facing portal

Potential Demand Reductions: Water savings for enrolled customers range from 2 to 10%; participation is key!

Source: https://www.azwater.gov/sites/default/files/media/2020_TownofPrescottValleyCustomerPortal_Redacted_2.pdf

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Utility-side Leak Notification Programs

Smart Practices to Save Water

An Evaluation of AMI-enabled Proactive Leak Notification Programs

Potential Demand Reductions: Up to 1% savings for overall single-family water use for well designed programs

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Preliminary Recommendation #4:
Improve increasing block rate design

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Water Rate Per Thousand Gallons
Current Rates Effective January 1, 2024

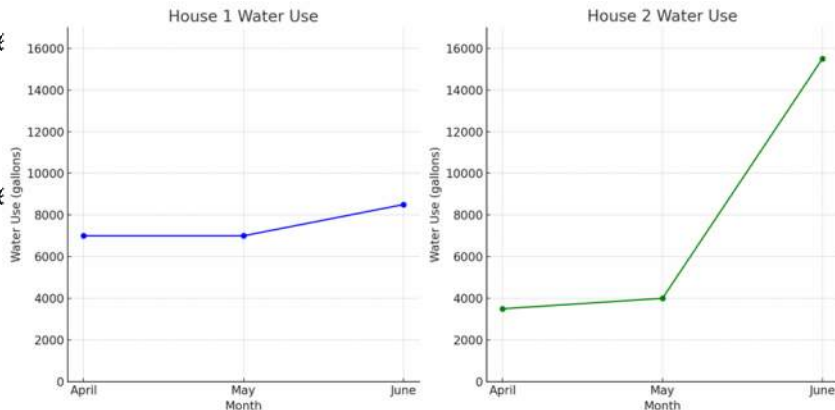
	Quarterly	2023 Per Thousand Gallons	2024 Per Thousand Gallons
1st Step	0 -20,000 gals	\$5.03	\$5.44
2nd Step	20,001-50,000 gals	\$6.12	\$6.61
3rd Step	Over 50,000 gals	\$7.65	\$8.26

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Example of limitation of quarterly billing in rate design

House 1 Quarterly Use
23,00 gallons

House 2 Quarterly Use
23,00 gallons



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Good Example of increasing block rate structure

Proposed Water Blocks	Approx. % of Bills in New Blocks	Water Usage Examples (CF)	Current Monthly Bill	Proposed Monthly Bill	Impact (\$)
Basic Needs 0-600	55%	588	\$33.97	\$33.40	-\$0.57
Larger Family 600-1,200	25%	1200	\$60.22	\$60.88	\$0.66
Efficient Irrigation 1,200-2,600	15%	1600	\$79.58	\$85.04	\$5.46
Enhanced Irrigation >2,600	5%	3208	\$160.74	\$191.28	\$30.55

Source: <https://www.olatheks.gov/Home/Components/News/News/3362/57>

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Improve increasing block rate structures – Preliminary recommendations

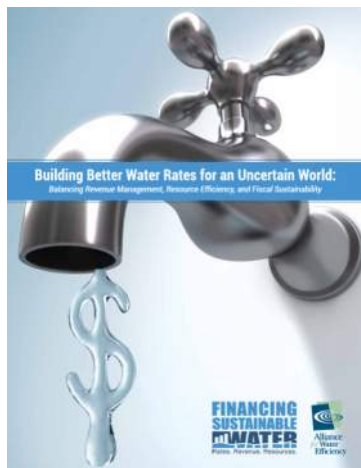
Size blocks based on basic indoor use, efficient outdoor use, and excessive outdoor use

Ensure the costs of serving peak customers are allocated to peak customers, which better reflects cost of service, promotes conservation, and improves relative affordability for customers with only basic indoor use

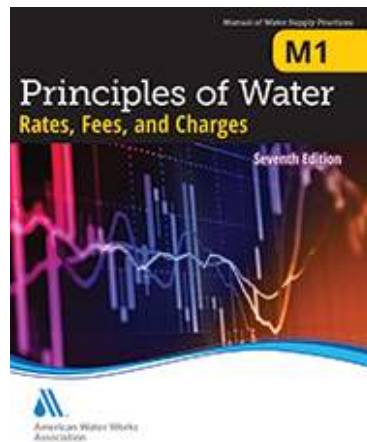
Potential demand reductions: Demand reductions will vary. Poorly designed structures will not reduce demands and well-designed structures **can reduce demands by 10% or more and be revenue neutral**. Revenue and demand impacts of a given rate structure can be estimated as part of a rate study that accounts for price elasticity and strength of the conservation signal.

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Rate Designs – implementation



Free resource available at www.allianceforwaterefficiency.org/resources/financing-sustainable-water



Available at AWWA bookstore

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Preliminary recommendations for long-term demand reductions

1. Conduct, Validate, and Act on Annual American Water Works Association (AWWA) Water Loss Audits
2. Adopt Advanced Metering Infrastructure and Monthly Billing
3. Implement Customer-Side Leak Detection Programs
4. Improve Increasing Block Rate Designs

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318 W Adams St., Ste. 1514
Chicago, IL 60606

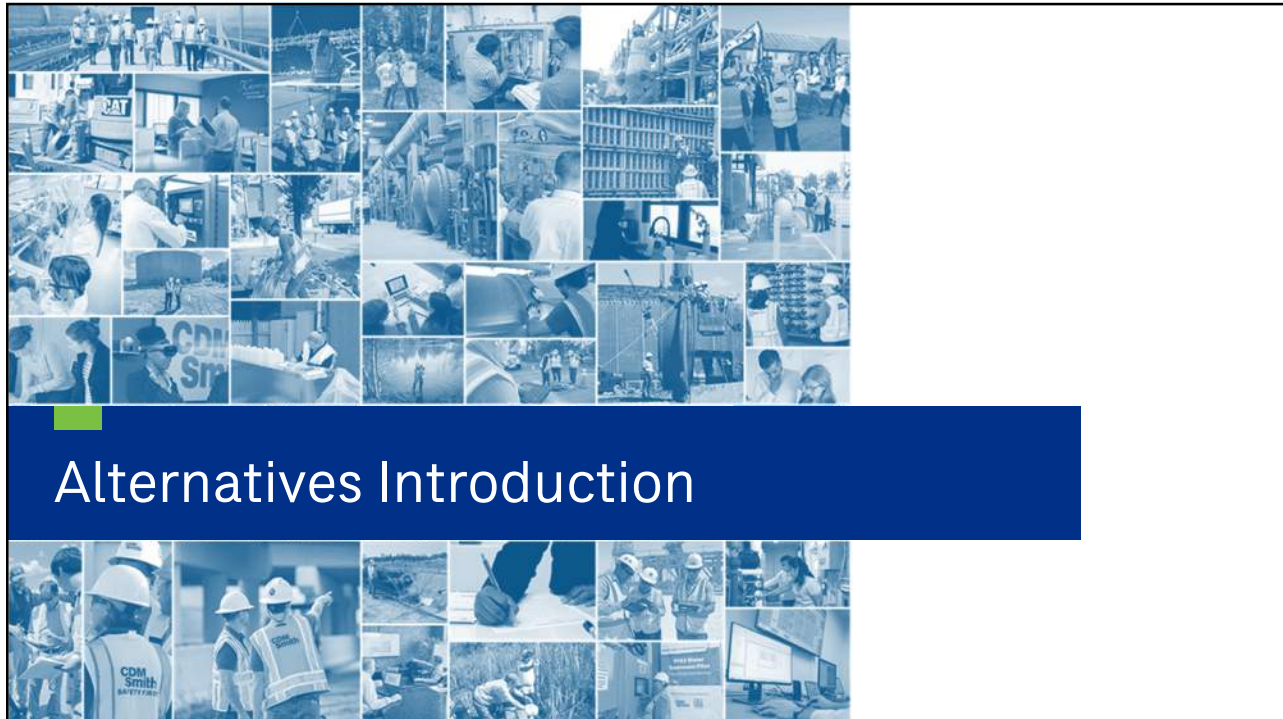
OFFICE 773-360-5100

<https://www.allianceforwaterefficiency.org>

Alliance for Water Efficiency

Thank You!

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Hypothetical Alternatives (“Projects/Policies”) for OCPC

Supply Side	Demand Side
<ul style="list-style-type: none"> ▪ MWRA for all communities ▪ MWRA for communities abutting Stoughton and Weymouth ▪ MWRA for communities abutting Weymouth ▪ More MWRA for Stoughton ▪ Desalination at max capacity to supply X communities ▪ Desalination at 80% capacity to retain buffer ▪ Centralized PFAS treatment facilities ▪ Decentralized PFAS treatment programs ▪ Interconnections: A, B, C, D, E, F,etc. ▪ Brackish groundwater ▪ Stormwater capture ▪ Reclaimed water for non-potable uses ▪ Additional operational staff 	<ul style="list-style-type: none"> ▪ Conduct, Validate, and Act on Annual AWWA Water Loss Audits ▪ Adopt AMI and Monthly Billing ▪ Implement Customer-Side Leak Program ▪ Improve Tiered Rate Designs

Examples

66

66

Demand Side Alternatives Discussion



People
Pine DuBois
John Haines
Bob Kostka
Kendra Martin
Val Massard
Liz Shea
Dan Sullivan
Kirk



People
Jason Duff
Kimberly Groff
Shane O'Brien
Noreen O'Toole
Wayne Parks
Greg Swan
Brian Vasa
Amara



People
Jonathan Beder
Peter Gordon
Duane LaVangie
Phil McNulty
Greg Tansey
Kara and Grace Inman

D (hybrid)



People
Peter Forman
Jon Hobill
Gavin Murphy
Jimmy Powell
Brian Vasa
Art Edgerton
Martin Pillsbury
Margherita Prior
Grace Houghton

OCPC Regional Water Plan 67

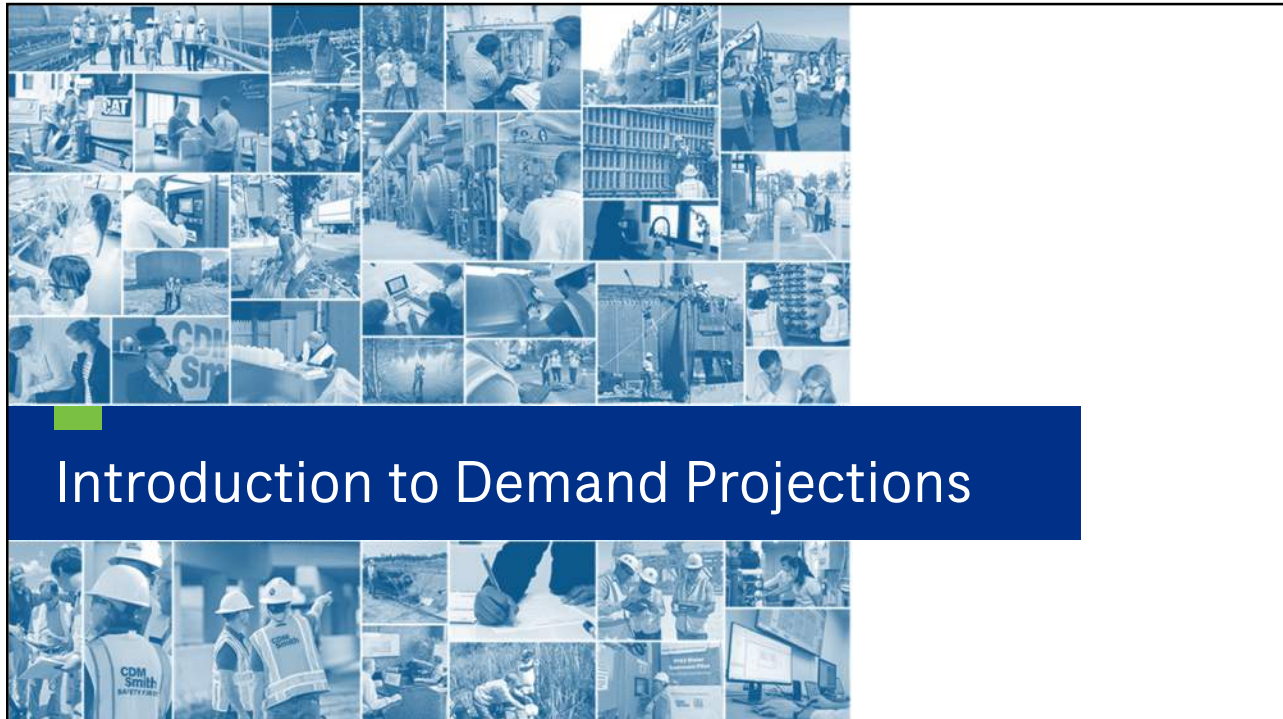
67

Discussion Questions

1. What are your reactions to these preliminary recommendations?
2. Are there demand side management strategies your community already has in place?
3. Are there recommendations that you think your community is more likely to implement?
4. Are there any demand side management that you don't think seem feasible for your community?
5. Are there other demand side management strategies you would like to hear more about?
6. Do you have any additional questions about the recommendations for demand side management presented today?

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Demand Projections Introduction

- Different methodologies exist with varying cost and complexity
- Methods fall along a spectrum rather than being a strict or exact approach
- Selecting which method depends on purpose of forecast (e.g., policy vs master planning), data availability and quality, cost and time constraints, and importance of geospatial accuracy



OCPC Regional Water Plan 70

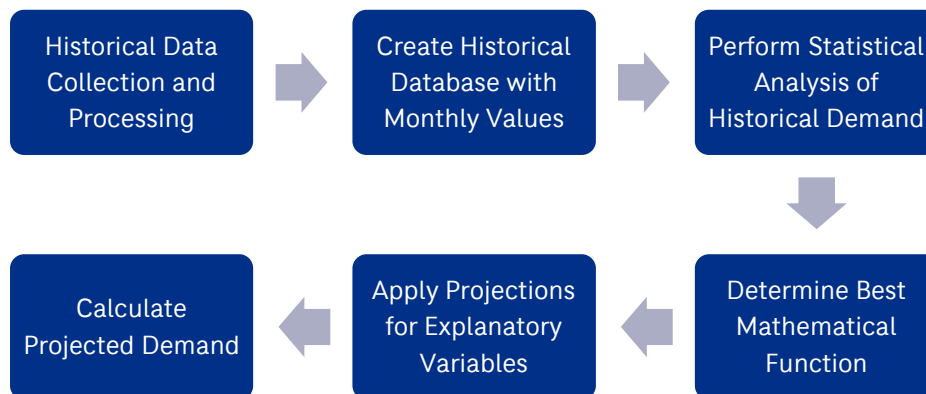
70

Demand Projections Methodology

- Econometric Function
 - Form of regression analysis that incorporates economic variable(s)
 - Assumes **per unit water use** (dependent variable) is a **function** of several **explanatory factors** (independent variables)
 - Unit use rate changes over time as those explanatory factors change
- Variables included in function are based on iterative process to determine combination with highest correlation with historical water use
- Adjusted R² to measure correlation – adjusts for number of terms in model, only increases if new variable improves model

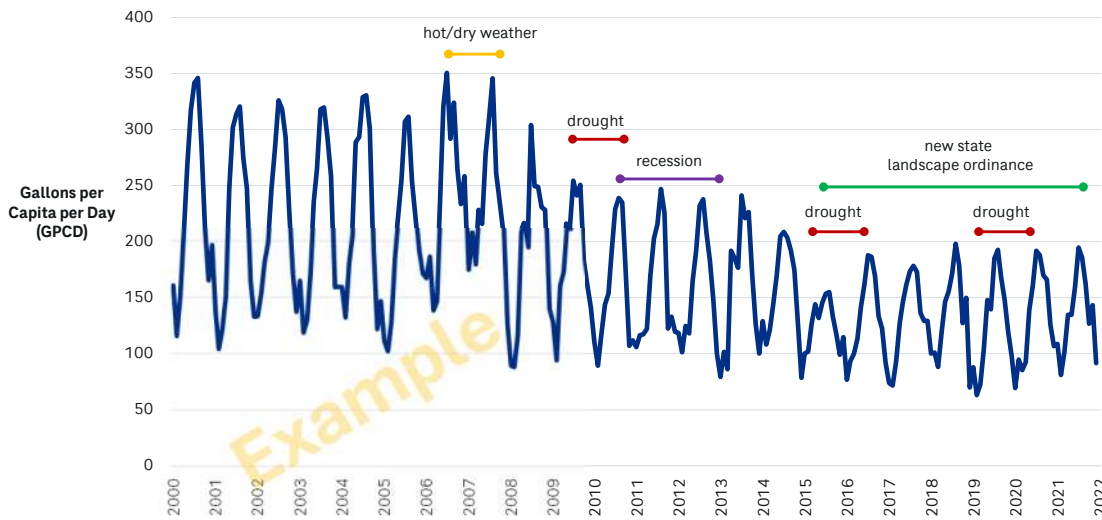
71

Overview of Econometric Demand Projection Process



72

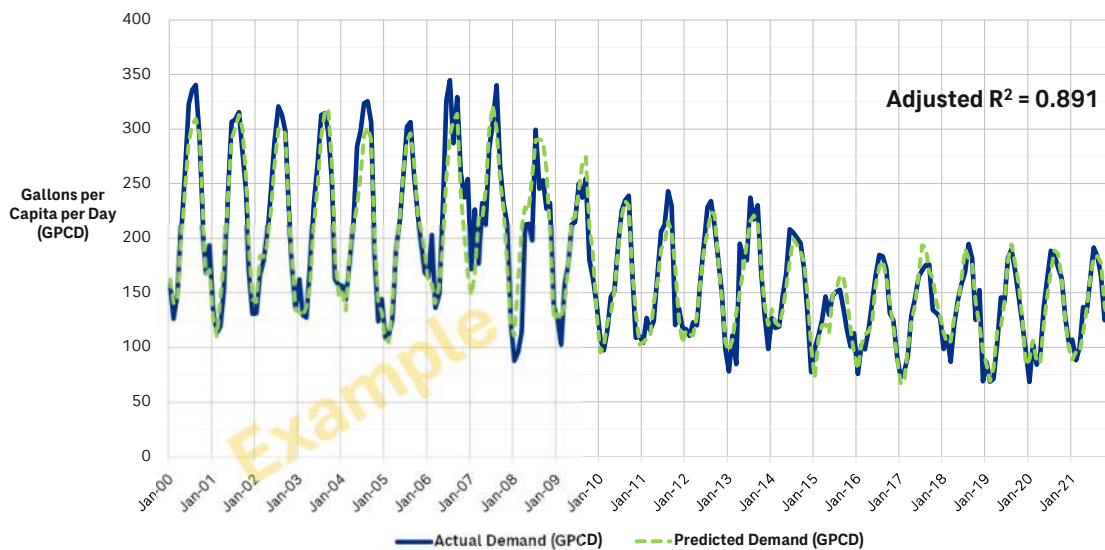
Example of Historical Water Use Trends and Impacts



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Example Demand Model Verification

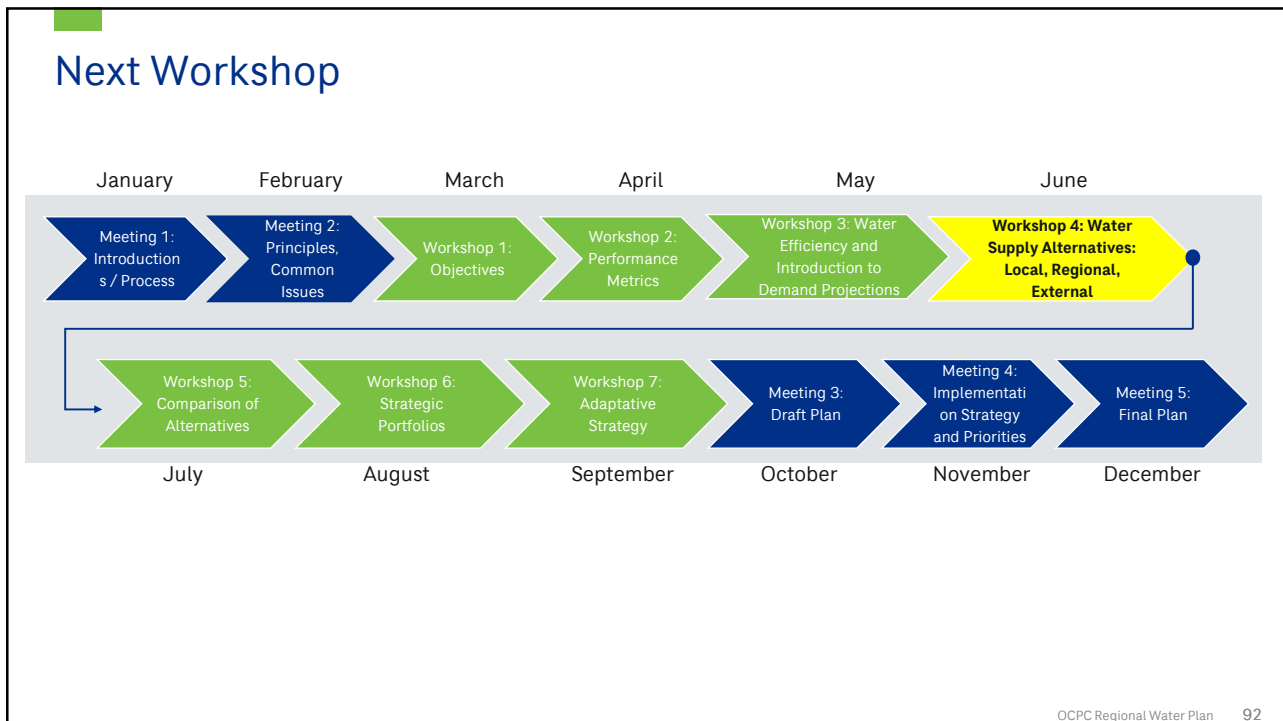


OCPC Regional Water Plan 74

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Upcoming Schedule

WHEN	DETAILS
Tuesday, June 25 th 9:00 am - 12:00 pm	Workshop 4
Wednesday July 31 st 9:00 am - 12:00 pm	Workshop 5
Tuesday, August 27 th 9:00 am - 12:00 pm	Workshop 6
Tuesday, September 24 th 9:00 am - 12:00 pm	Workshop 7
Tuesday, October 29 th 9:00 am - 12:00 pm	Meeting 3
Monday, November 18 th 8:00 am - 12:00 pm	Meeting 4
Tuesday, December 10 th 8:00 am - 12:00 pm	Meeting 5

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Feedback Survey



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Last Meeting: Feedback Survey Results

1. Please tick one box per row.

The meeting had a clear agenda.

Facilitation of today's meeting was effective.

I had plenty of opportunity to participate in the discussion today.

Interactions were positive and respectful.

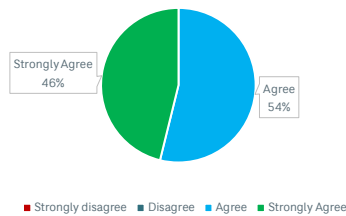
I understand where we are in the process and where we are going.

Strongly disagree	Disagree	Agree	Strongly agree
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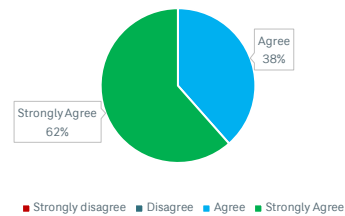
95

Last Meeting: Feedback Survey Results

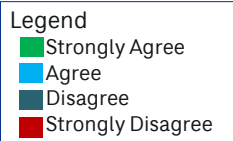
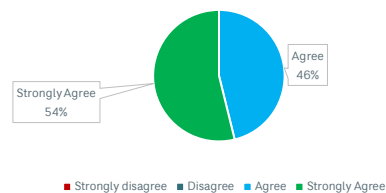
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Facilitation of today's meeting was effective.



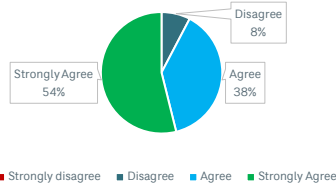
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96

Last Meeting: Feedback Survey Results

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