



## **WATER FORWARD**

INTEGRATED WATER RESOURCE PLAN

### **Austin Integrated Water Resource Planning Community Task Force**

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**January 17, 2017**

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**Austin Integrated Water Resource Planning Community Task Force**  
**January 17, 2017 – 6:00 p.m.**  
**One Texas Center, Room 325**  
**505 Barton Springs Rd**  
**Austin, TX 78704**

**For more information go to:**  
**[Austin Integrated Water Resource Planning Community Task Force](#)**

## **AGENDA**

### **Voting Members:**

Sharlene Leurig - Chair	Marianne Dwight	Sarah Richards
Jennifer Walker – Vice Chair	Diane Kennedy	Lauren Ross
Todd Bartee	Perry Lorenz	Kate Zerrenner
Clint Dawson	Bill Moriarty	

### **Ex Officio Non-Voting Members:**

Austin Water: Greg Meszaros  
Austin Energy: Kathleen Garrett  
Austin Resource Recovery: Sam Angoori  
Neighborhood Housing and Community Development: Rebecca Giello  
Office of Innovation: Kerry O'Connor  
Office of Sustainability: Lucia Athens  
Parks and Recreation: Sara Hensley  
Watershed Protection: Mike Personett

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### **1. CALL TO ORDER – January 17, 2017, 6:00 p.m.**

### **2. CITIZEN COMMUNICATION**

The first 10 speakers signed up prior to the meeting being called to order will each be allowed a three-minute allotment to address their concerns regarding items not posted on the agenda.

### **3. APPROVAL OF MEETING MINUTES**

- a. Approval of the meeting minutes from the December 13, 2016 Task Force meeting (5 minutes)

**4. STAFF BRIEFINGS, PRESENTATIONS, AND OR REPORTS**

- a. Update on Public Outreach Efforts - City Staff and Consultant (60 minutes)
  - i. Task Force Discussion and Input
- b. Demand Management and Supply Side Options Update (20 minutes)
  - i. Task Force Discussion and Input
- c. Disaggregated Demand Model Follow-Up – City Staff (20 minutes)
  - i. Task Force Discussion and Input

**5. SUBCOMMITTEE REPORTS**

**6. VOTING ITEMS FROM TASK FORCE**

**7. FUTURE AGENDA ITEMS**

**8. ADJOURN**

Note: Agenda item sequence and time durations noted above are subject to change.

The City of Austin is committed to compliance with the American with Disabilities Act. Reasonable modifications and equal access to communications will be provided upon request. Meeting locations are planned with wheelchair access. If requiring Sign Language Interpreters or alternative formats, please give notice at least 2 days (48 hours) before the meeting date. Please call Austin Integrated Water Resource Planning Community Task Force, at 512-972-0194, for additional information; TTY users route through Relay Texas at 711.

For more information on the Austin Integrated Water Resource Planning Community Task Force, please contact Marisa Flores Gonzalez at 512-972-0194.

# MINUTES



**The Austin Integrated Water Resource Planning Community Task Force convened in a regular meeting on December 13, 2016 at Glen Bell Service Center, Rm 134, 3907 S. Industrial Drive, in Austin, Texas.**

**Members in Attendance:**

Jennifer Walker – Vice Chair  
Perry Lorenz  
Clint Dawson

Diane Kennedy  
Sarah Richards  
Bill Moriarty

Lauren Ross

**Ex-Officio Members in Attendance:**

Mike Personett

**Staff in Attendance:**

Kevin Critendon, Teresa Lutes, Joe Smith, Marisa Flores Gonzalez, Bruk Berhanu, Mark Jordan, Ginny Guerrero, Prachi Patel, Chris Herrington, Katherine Jashinski, Zach Baumer, Ian Toohey, Jeff Fox, Ryan Robinson

**Additional Attendees:**

John Burke

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**1. CALL TO ORDER**

Jennifer Walker, Vice Chair, called the meeting to order at 2:00 p.m.

**2. CITIZEN COMMUNICATION: GENERAL**

**3. APPROVAL OF MEETING MINUTES**

The meeting minutes from the December 6, 2016 Austin Integrated Water Resource Planning Community Task Force regular meeting were approved on Member Moriarty's motion and Member Dawson's second on a 8-0-0-3 vote with Members Leurig, Zerrenner, and Richards absent.

**4. STAFF BRIEFINGS, PRESENTATIONS, AND/OR REPORTS**

- a. Disaggregated Demand Model Overview presentation was provided by Joe Smith, P.E., Supervising Engineer, Bruk Berhanu, Engineering Intern, and Marisa Flores Gonzalez, Senior Planner, Austin Water. This briefing was followed by a Task Force discussion including questions and answers.

**5. SUBCOMMITTEE REPORTS**

- a. Written Public Outreach and Code Subcommittee Reports were provided in Task Force Member Packets.

**6. VOTING ITEMS FROM TASK FORCE**

None

**10. FUTURE AGENDA ITEMS**

None

**Vice Chair Walker adjourned the meeting at 7:59 pm.**

# **PRESENTATION**



# Integrated Water Resource Plan

## Task Force Meeting

January 17, 2017



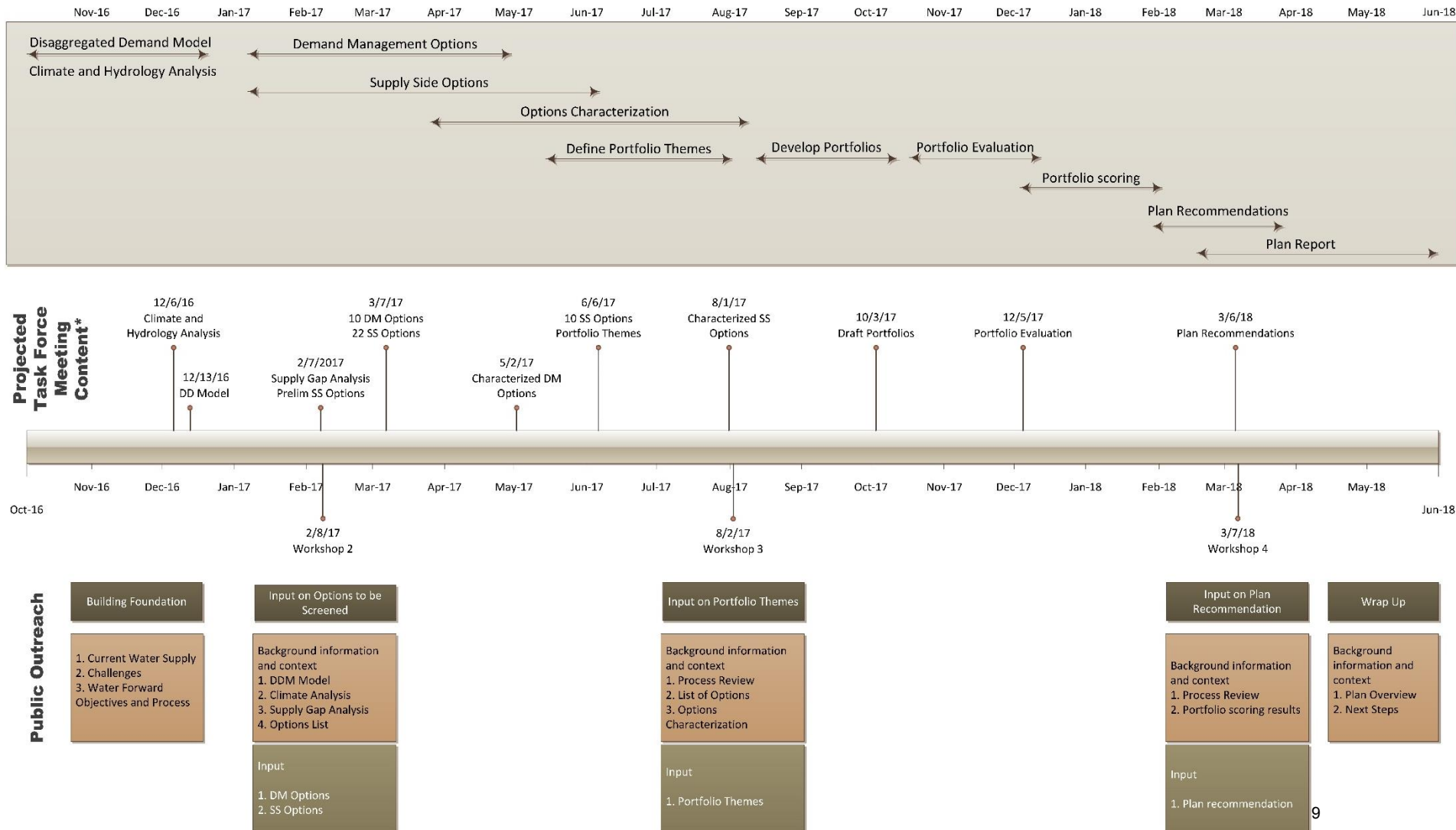
## Update on Public Outreach Efforts



# Goals

- Identify community values around water and reflect in IWRP
- Make project information readily available throughout process
- Seek input that reflects the diversity of Austin
- Build on community partnerships and communication networks
- Provide stakeholders opportunities to interact with project team, ask questions
- Respond to public questions and concerns

## Water Forward Outreach Timeline



# Ongoing Outreach Activities

- Online Outreach
  - Social media: Facebook, Twitter, Instagram
  - eNewsletters
    - Water Forward, WaterWise, Imagine Austin, Sustainability Office, AE's Power Plus, etc.
  - NextDoor
- Community and neighborhood association meetings
- Community events and festivals
- Presentations to other relevant boards & commissions i.e. RMC, Water & Wastewater, Environmental Board
- Surveys
  - Community Values Survey
  - Public Comment Portal
    - Demand management options
    - Supply side options



At Carver Library



Booth at Pleasant Market

# Community Value Survey Responses – In Progress

AUSTIN WATER’S FUTURE:  
**WHAT’S IMPORTANT TO YOU?**

What things are important to you when it comes to water?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What do you see as issues or challenges as we plan Austin’s future water resources?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

What do you think we should do to make sure we have water over the next 100 years?

\_\_\_\_\_

\_\_\_\_\_


\_\_\_\_\_

What other suggestions, comments, or questions do you have?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**WATER FORWARD**

INTEGRATED WATER RESOURCE PLAN

**As of January 6, 2017**

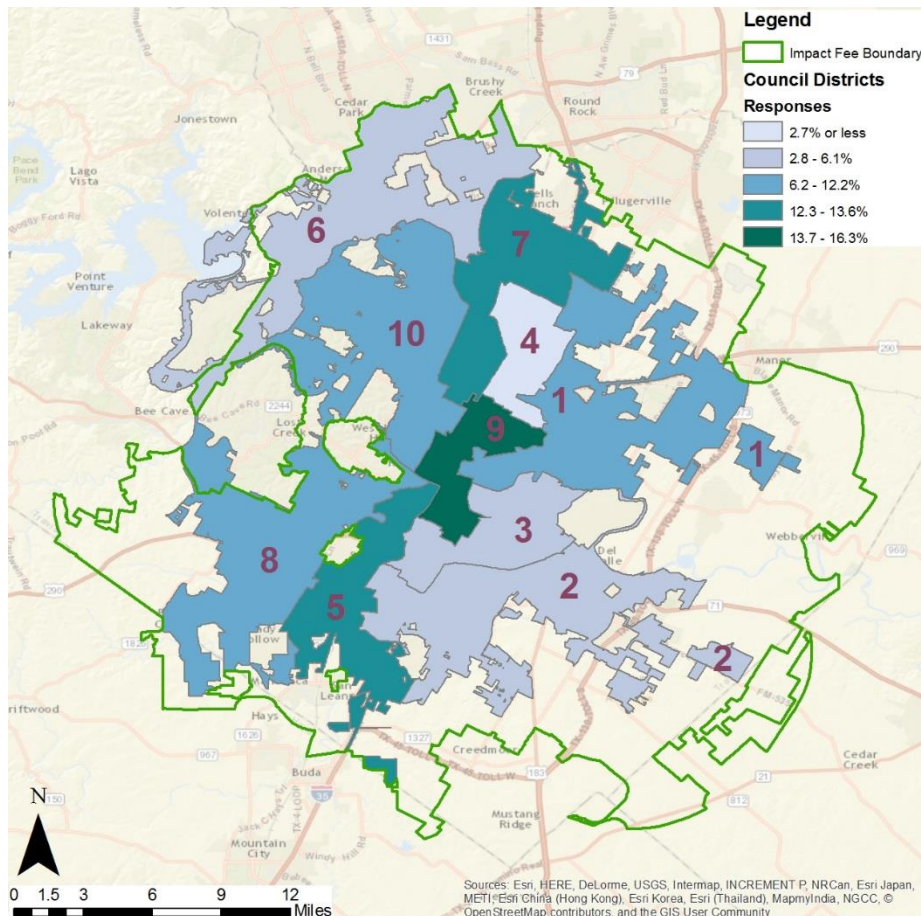
Number of online responses	160
Number of paper survey responses	132
<hr/>	
Number of responses received	292



# Community Value Survey Responses – In Progress

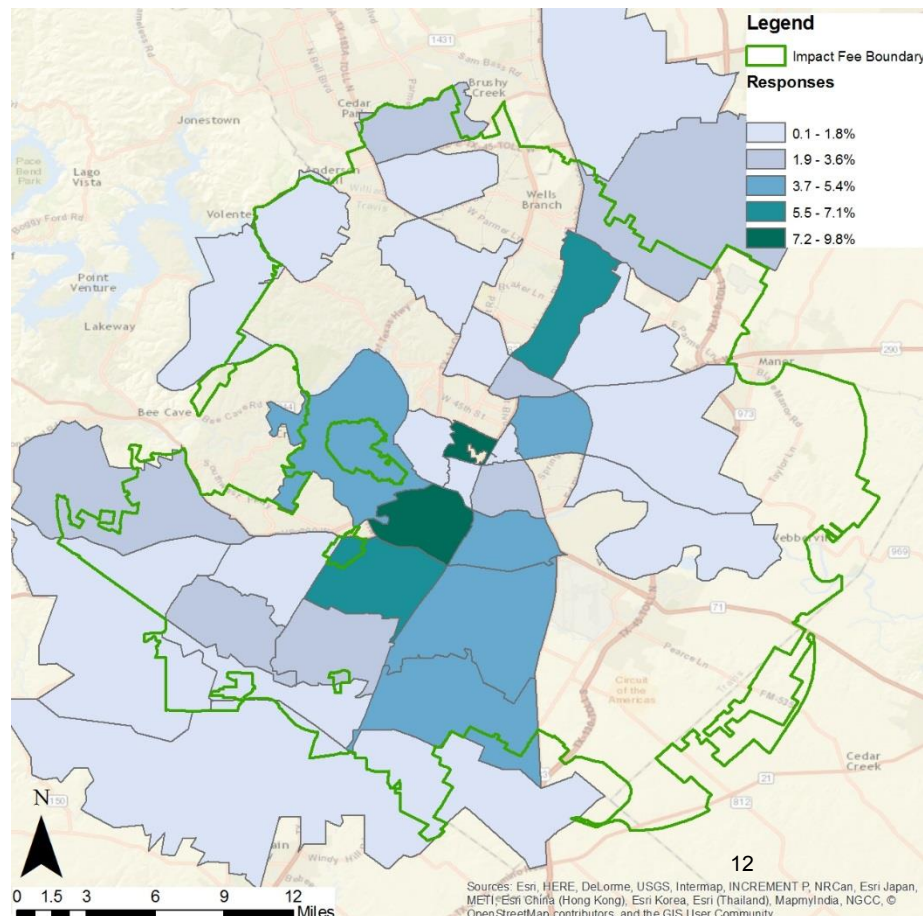
Distribution of responses across Austin  
when Council District was specified

Responses received: 147/292



Distribution of responses across Austin  
when only zipcode was specified

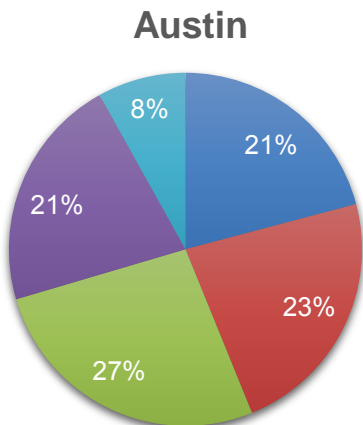
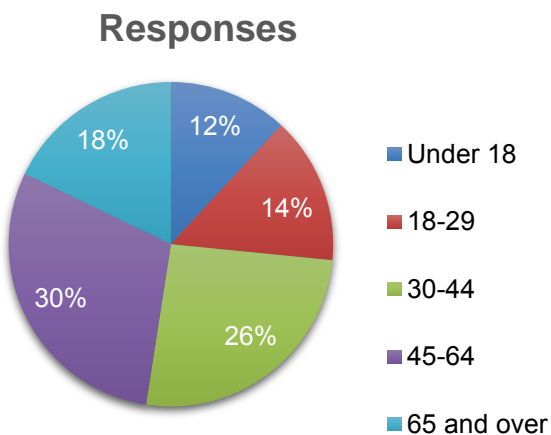
Responses received: 112/292



# Community Value Survey Responses – In Progress

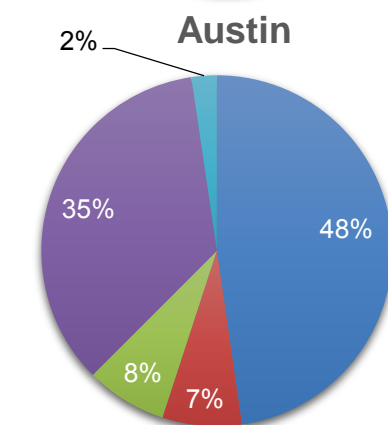
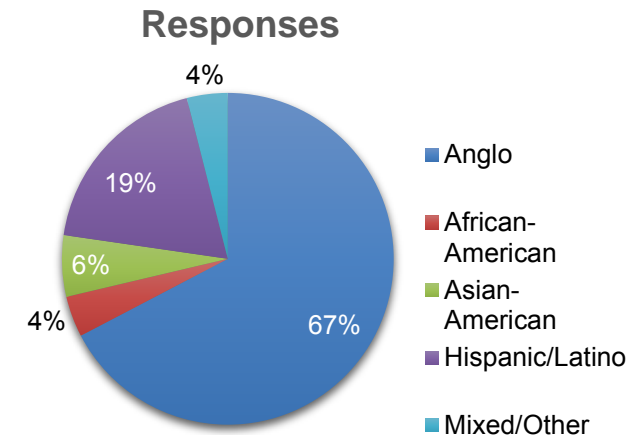
## Distribution of responses across age groups

Responses received: 286/292



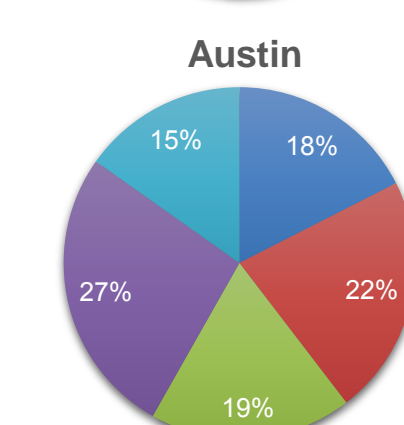
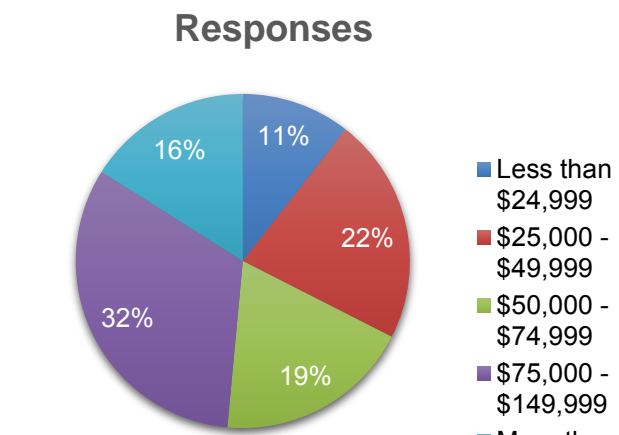
## Distribution of responses across ethnicity

Responses received: 251/292



## Distribution of responses across household income groups

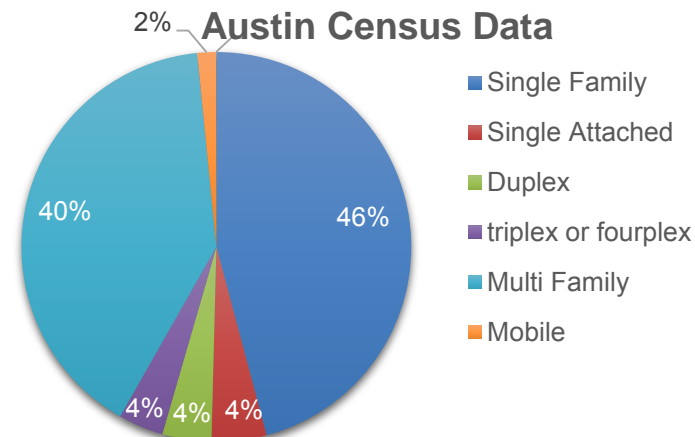
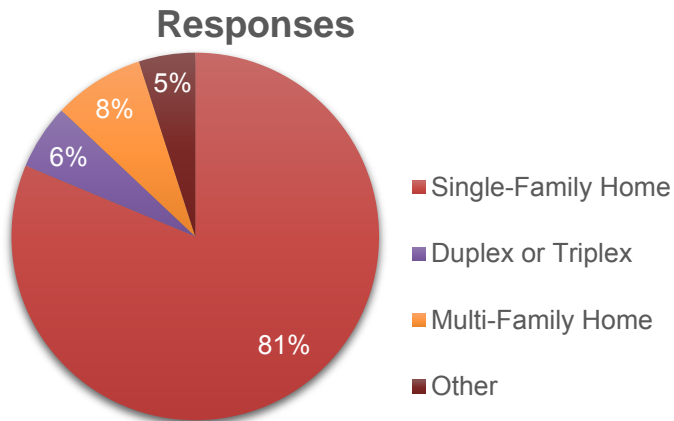
Responses received : 237/292



# Community Value Survey Responses – In Progress

Distribution of responses  
across type of residence

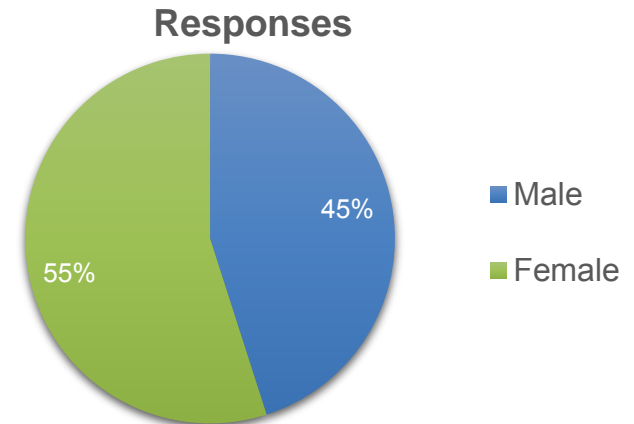
Responses received: 262/292



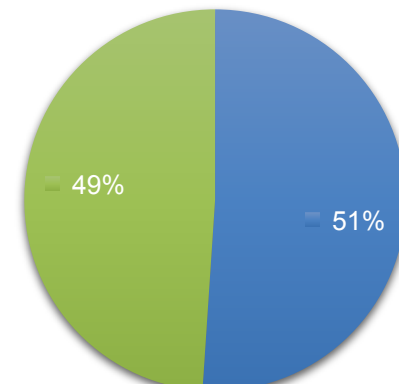
Source: US Census American Community Survey

Distribution of responses  
across gender

Responses received: 273/292



**Austin Census Data**



Source: US Census American Community Survey

# Community Value Survey Responses

## Common themes

**Question:** What things are important to you when it comes to water?





# Community Value Survey Responses

## Common themes

**Question:** What do you see as issues or challenges as we plan Austin's future water resources?

Increasing development leading to water pollution

Climate change impacts

Lack of conservation

Increasing rates

Population growth

Aging infrastructure

Drought

Wasting water on landscaping

Lack of community awareness of water issues

Managing water supply

Maintaining adequate supply

# Community Value Survey Responses

## Common themes

**Question:** What do you think we should do to make sure we have water over the next 100 years?

Water use and development restrictions

Encourage conservation

Innovative technology

Education

Drought resistant native plants

Alternative sources of water

Diversification of sources

Innovate landscaping practices

Rainwater harvesting

Create water efficient communities

## Public Workshop #1

- September 7, 2016
- Waller Creek Center
- 24 attendees
- Purpose
  - Gather public input on Goals and Objectives of Integrated Water Resource Plan

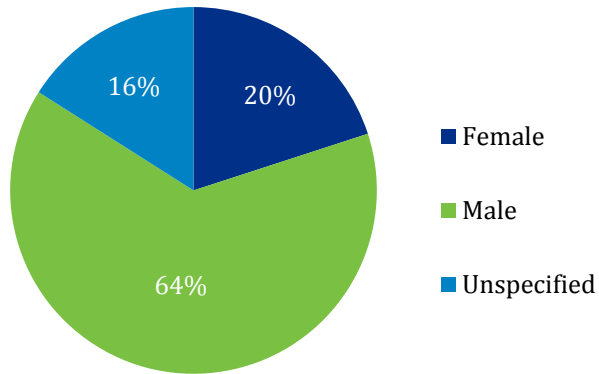


# Invitations

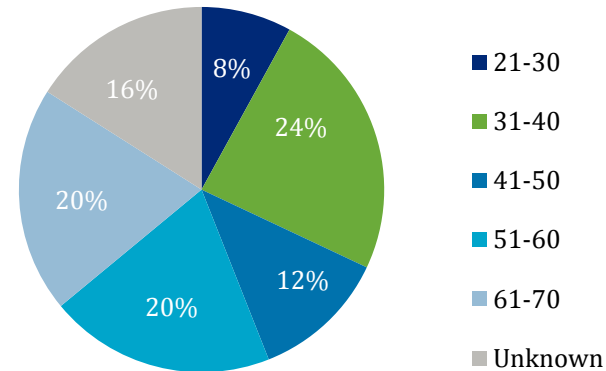
- Austin Water emailed the following eNewsletter lists a notice about the workshop:
  - Water Forward (225 stakeholders)
  - WaterWise Residential List (16,792)
  - WaterWise Commercial List (145)
- Austin Water emailed invitations to groups and individuals on the Water Forward stakeholder list, including:
  - Neighborhood associations
  - Businesses, developers, and professional organizations
  - Environmental advocates
  - Civic Leaders
  - Faith-based organizations
  - Education representatives
- Austin Water reached out to City Council members and engaged the IWRP Task Force.
- Austin Water emailed the staff liaisons for the Water Wastewater Commission, Resource Management Commission (RMC), and the Environmental Commission.
- Posted information to Next Door and Facebook and Twitter
- Posted information to the Water Forward website, <http://austintexas.gov/waterforward>

# Demographic summary of workshop participants

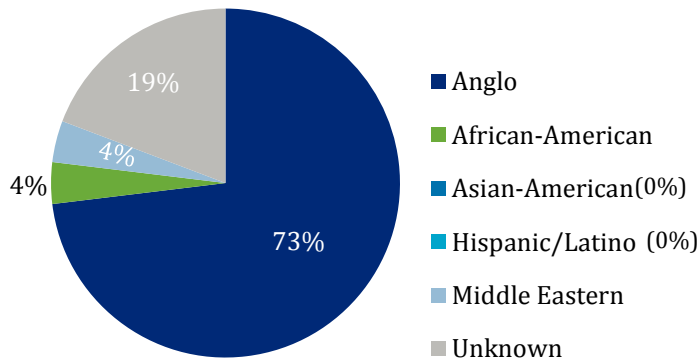
**Gender**



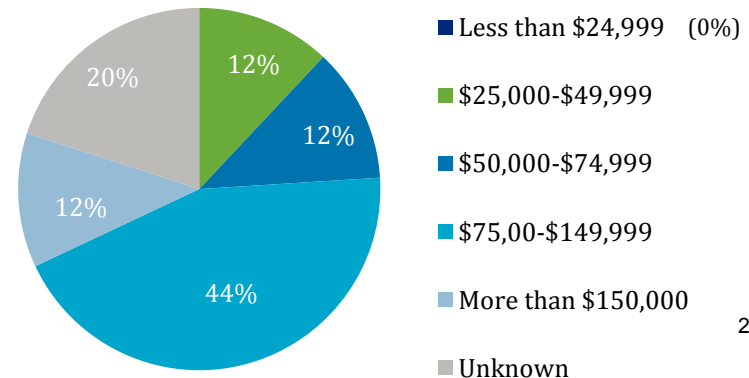
**Age**



**Race/Ethnicity**



**Household Yearly Income**





# What we shared

- Provided an overview of the background of Austin Water, the Integrated Water Resource Plan and the planning process, as well as future public outreach activities. The presentation highlighted:
  - Austin Water's demand and population
  - History, purpose and goals of the plan
  - IWRP development process and public outreach opportunities
- Outlined the guiding principles of the planning process and discussed the Objectives, Purpose and Desired Outcomes of the plan.
- Stakeholders were asked to give their feedback at each of five Objectives including: water supply benefits; economic benefits; societal benefits; implementation benefits and environmental benefits.

# What we heard

## Objective: Water Supply Benefits

**Purpose:** Sustain Austin's water supply reliability, providing resiliency for future population growth and climate change

### Feedback:

- Desire to plan for future shortages now
- Concern about drought
- Planning for climate change
- Value infrastructure investment with an eye on conservation, safety, and water quality



# What we heard

## Objective: Economic Benefits

**Purpose:** Develop water reliability solutions that are cost-effective for the Austin community

Feedback:

- Affordability concerns including making sure rates stay affordable for families over time, especially low-income families
- Maintain flexibility, as technology and circumstances change over next 100 years

# What we heard

## Objective: Societal Benefits

**Purpose:** Provide societal benefits from improving water supply reliability for the Austin community

Feedback:

- Our community cares about low-income populations and underserved populations
- Stakeholders want to ensure that we can measure success in regard to societal benefits because livability, economic vitality and environmental justice can be difficult to quantify.

# What we heard

## Objective: Implementation Benefits

**Purpose:** Reduce potential implementation challenges thereby increasing likelihood of success for projects/programs

Feedback:

- Implementation should be innovative and raise the bar for other cities
- Account for and embrace emerging technologies
- Minimize public and private property impacts
- Clarify impacts and benefits to surrounding communities

# What we heard

## Objective: Environmental Benefits

**Purpose:** Protect and sustain the local environment for the benefit of the Austin community

Feedback:

- Conservation:
  - Use native landscaping
  - Capture air conditioning condensate for reuse
  - Expand grey water use
  - Update irrigation systems
- Look at net environmental impacts: water consumption, waste, energy, base flow, aquifers, aquatic plants and animals.

## **Purpose of Next Series of Stakeholder Outreach**

- Gather input from industry experts and stakeholders
- Get feedback on list of 25 demand management options to potentially refine options and help take list from 25 to 10 options

## **Input we are seeking from the experts**

- Are we moving in the right direction?
- What are the challenges/barriers to implementation (technical, political, feasibility?) How can these barriers be mitigated?
- New and innovative technologies that should be taken into account?

# Targeted stakeholder outreach meetings

## **Thurs. 1/19– Experts in landscaping, irrigation and outdoor water use**

- Landscape transformation
- Irrigation efficiency ordinances and incentives

## **Tues. 1/24 – Commercial and residential developers, home builders, land development, large volume water users**

- Alternative water ordinances
- Incentives that may include rainwater, graywater, AC condensate

## **Thurs. 1/26 - Commercial and residential developers, home builders, land development, large volume water users**

- Development-focused water use estimates and benchmarking
- Commercial, industrial and institutional and non-residential ordinances
- Plumbing codes and ordinances and fixture incentives
- Reclaimed water (centralized purple pipe system) ordinances and incentives

# Targeted stakeholder outreach meetings

## Invitations sent to:

- Emailed to targeted stakeholders
  - Industry professionals
  - Environmental Advocates
  - Education Representatives
  - Large Volume Users
  - Businesses and Developers
  - Chambers of Commerce and other Civic Organizations
- Personal invitation phone calls from Austin Water staff

## Format

- Short presentation explaining demand management strategies, focusing on landscape- and irrigation-specific topics
- Group facilitation for broad questions, feedback recorded on flip charts
- Small group breakouts for more detailed information including rebates, etc
- Survey forms to gather feedback

## Follow up

- Feedback will be summarized and considered in plan development

# **February 8th Workshop – Austin's Future Water Supply Needs and Strategies to meet them**

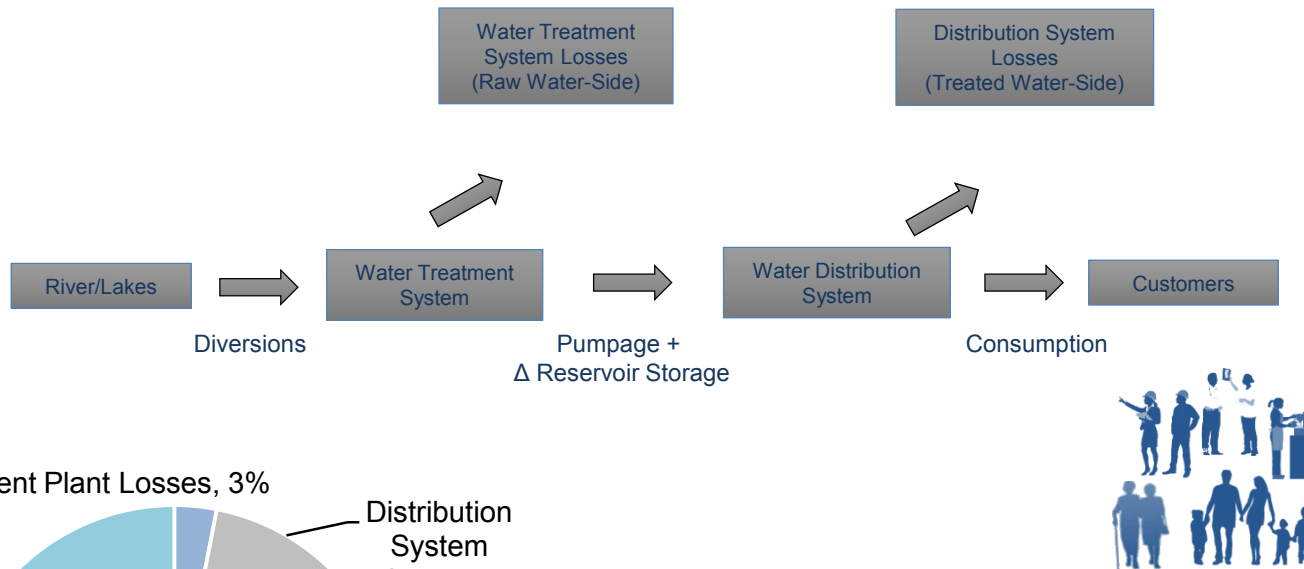
- 6:00 to 8:00 pm
- AISD PAC Multipurpose Room, 1500 Barbara Jordan Blvd.
- Potential Topics: Demand Management and Supply Side Strategies, Gap Analysis, Plan Development Process
- Gathering Input: Table discussions, surveys, comment forms, online open house & public comment portal



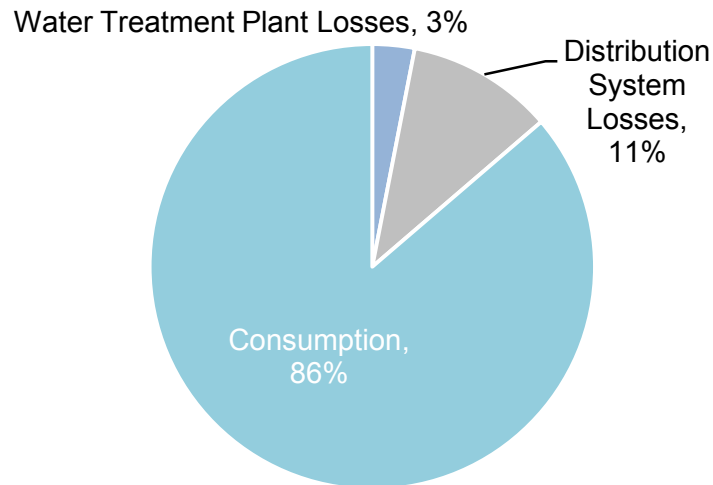
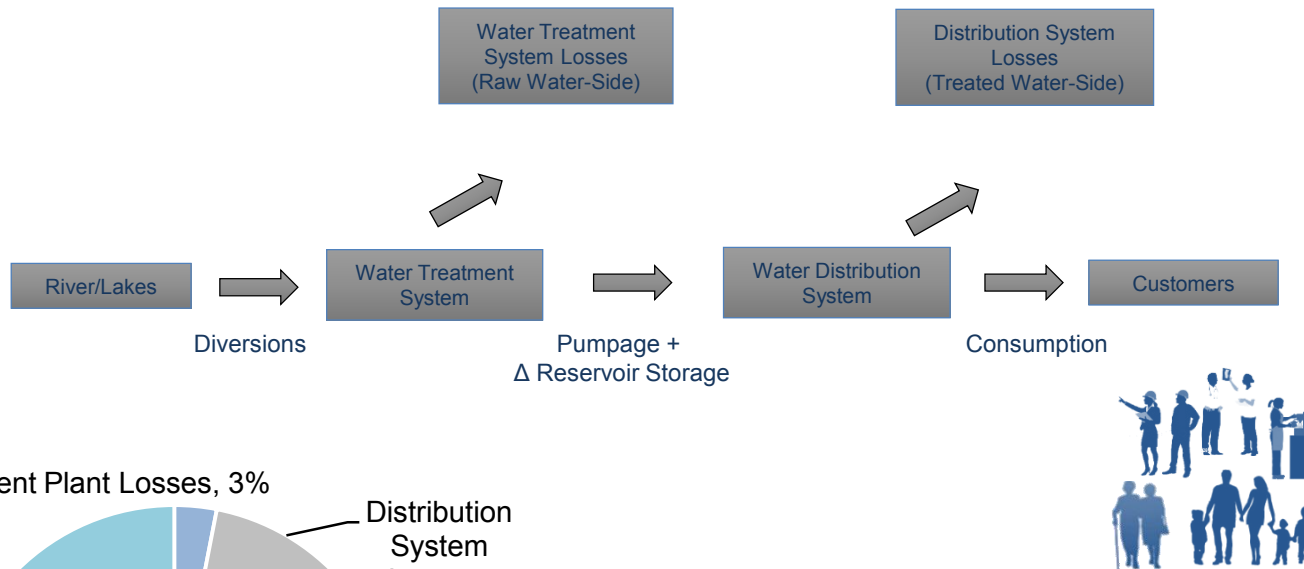
## **Demand Management and Supply Side Options Update**

## Disaggregated Demand Model Follow-Up

## Typical Water Flow In Austin’s Water System






## Typical Water Flow In Austin’s Water System

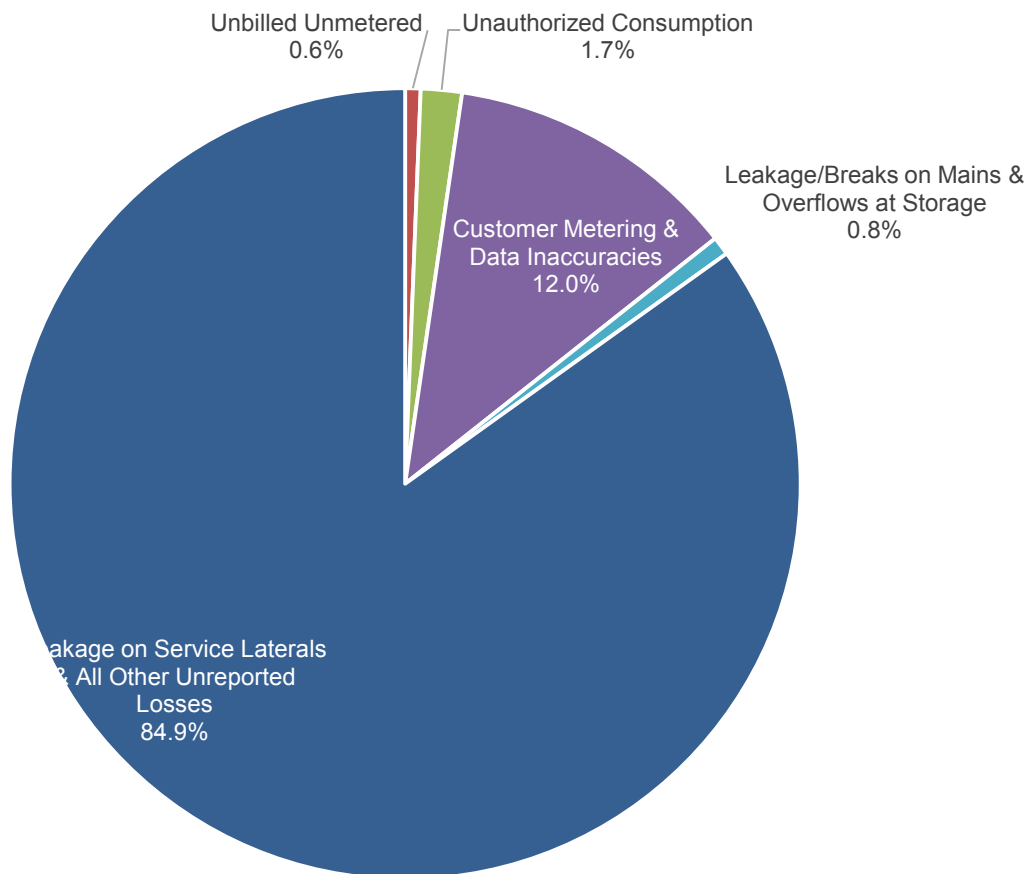


## Water Consumption and Losses after Diversions

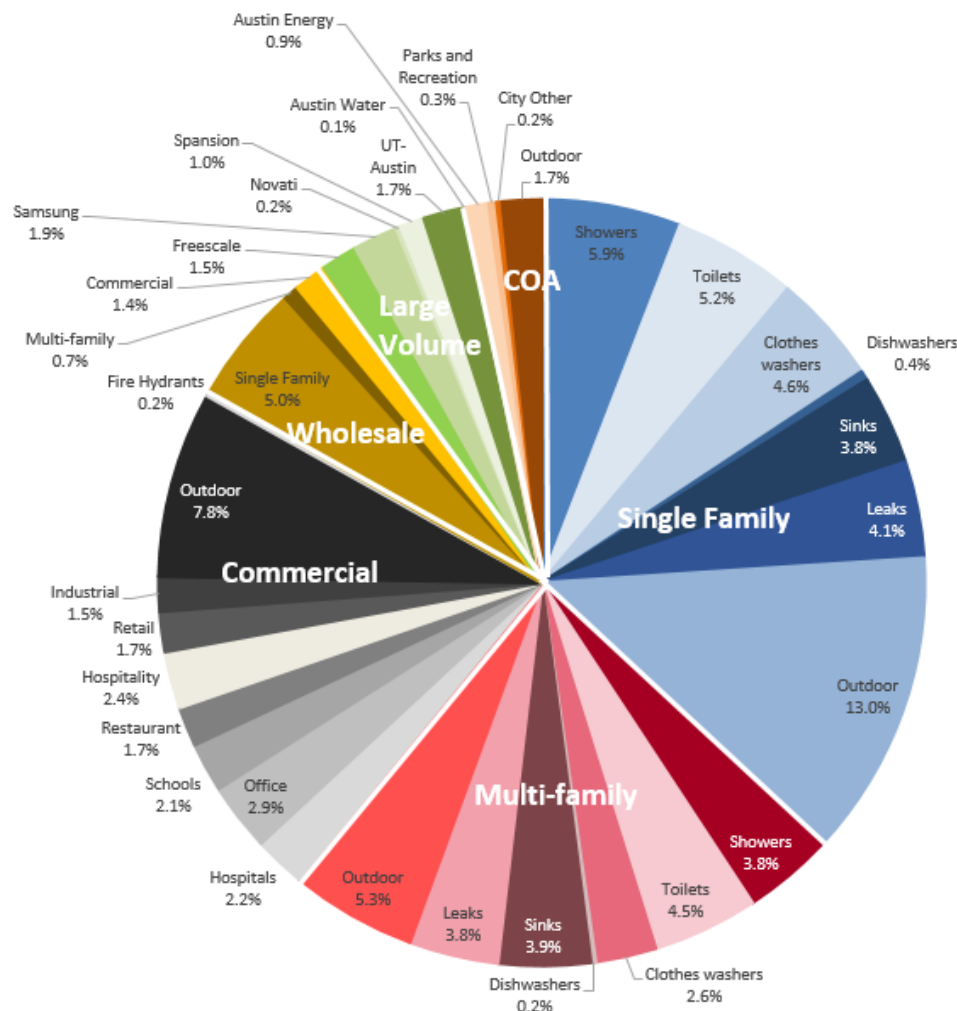
Authorized Consumption	Billed Authorized Consumption	Billed Water Exported (AW wholesale customers)	Revenue Water
		Billed Metered Consumption (AW retail customers)	
		Billed Unmetered Consumption (Other COA department field operations)	
	Unbilled Authorized Consumption	Unbilled Metered Consumption (AW facilities)	Non-Revenue Water
Water Losses	Apparent Losses	Unauthorized Consumption	
		Customer Metering & Data Inaccuracies	
	Real Losses	Leakage/Breaks on Mains & Overflows at Storage	
		Leakage on Service Laterals & All Other Unreported Losses	
		Raw Water Used at Water Treatment Plants	Untreated Diversions

-  Consumption in the Disaggregated Demand Model
-  Distribution system losses in the Disaggregated Demand Model
-  Water treatment plant losses in the Disaggregated Demand Model

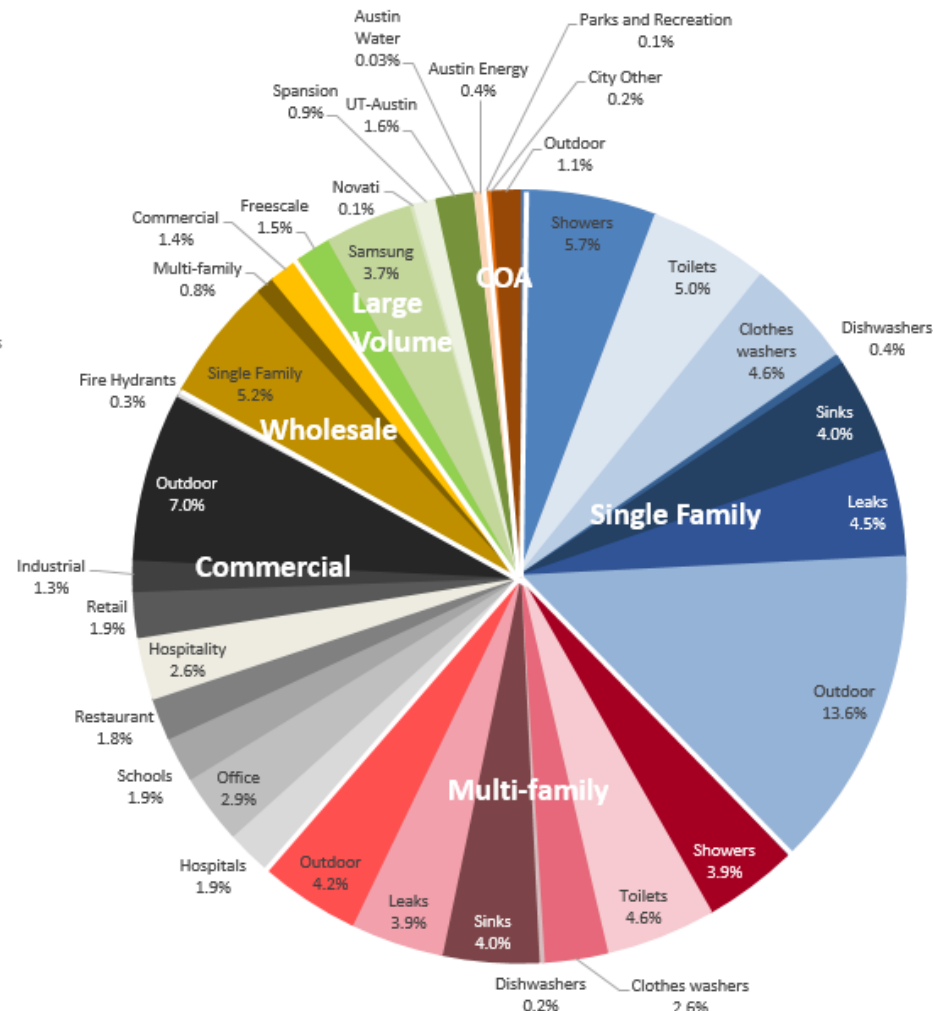
## 2014 & 2015 Average Distribution System Water Losses



## Historical Consumption

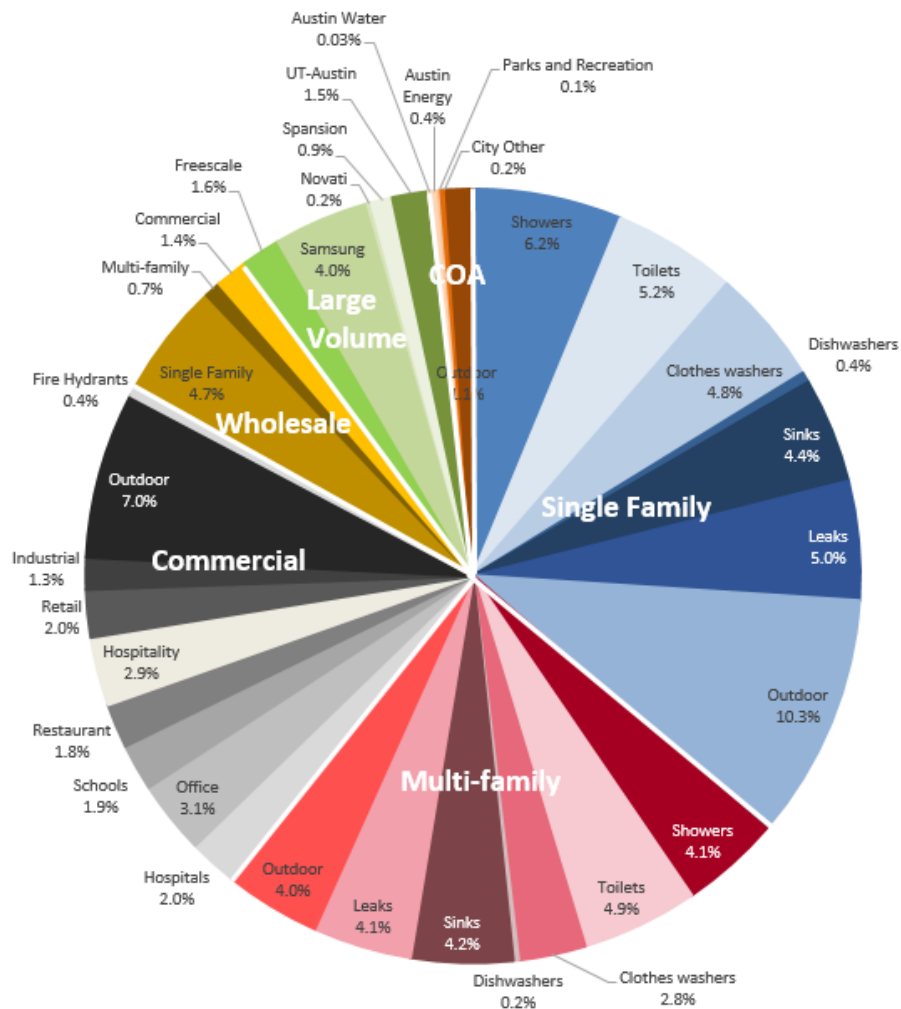


2010

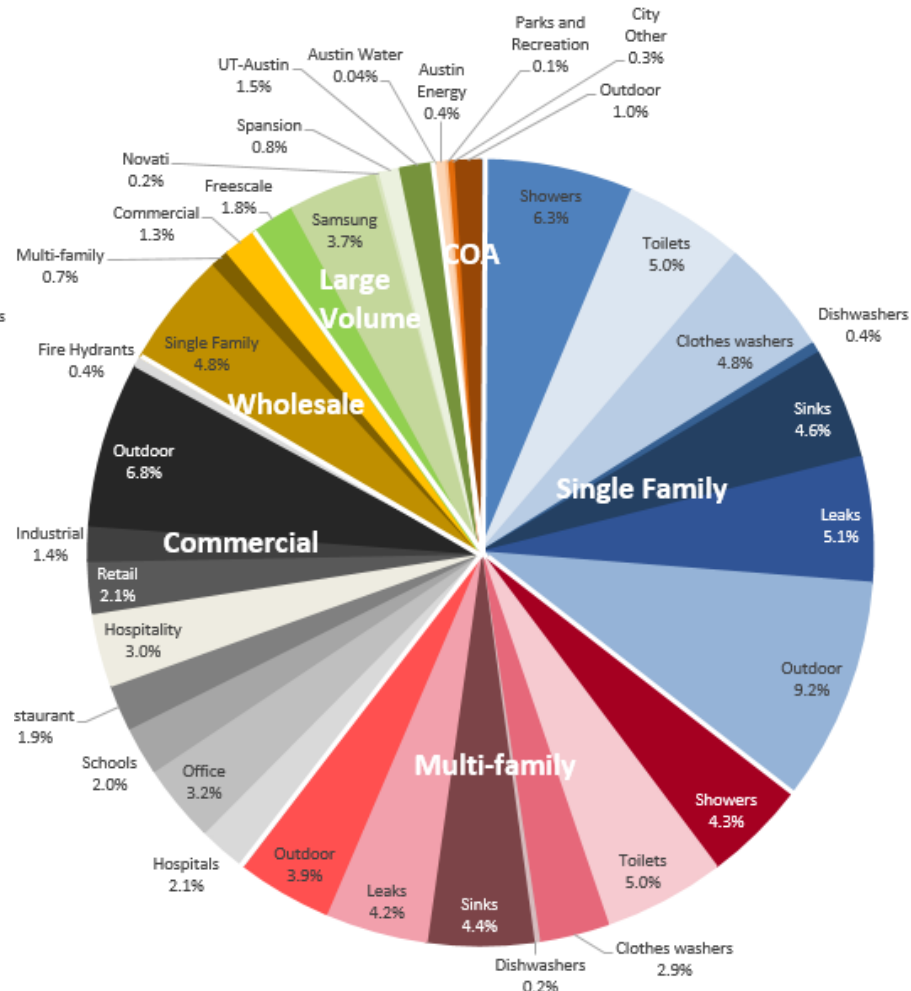


2012

## Historical Consumption



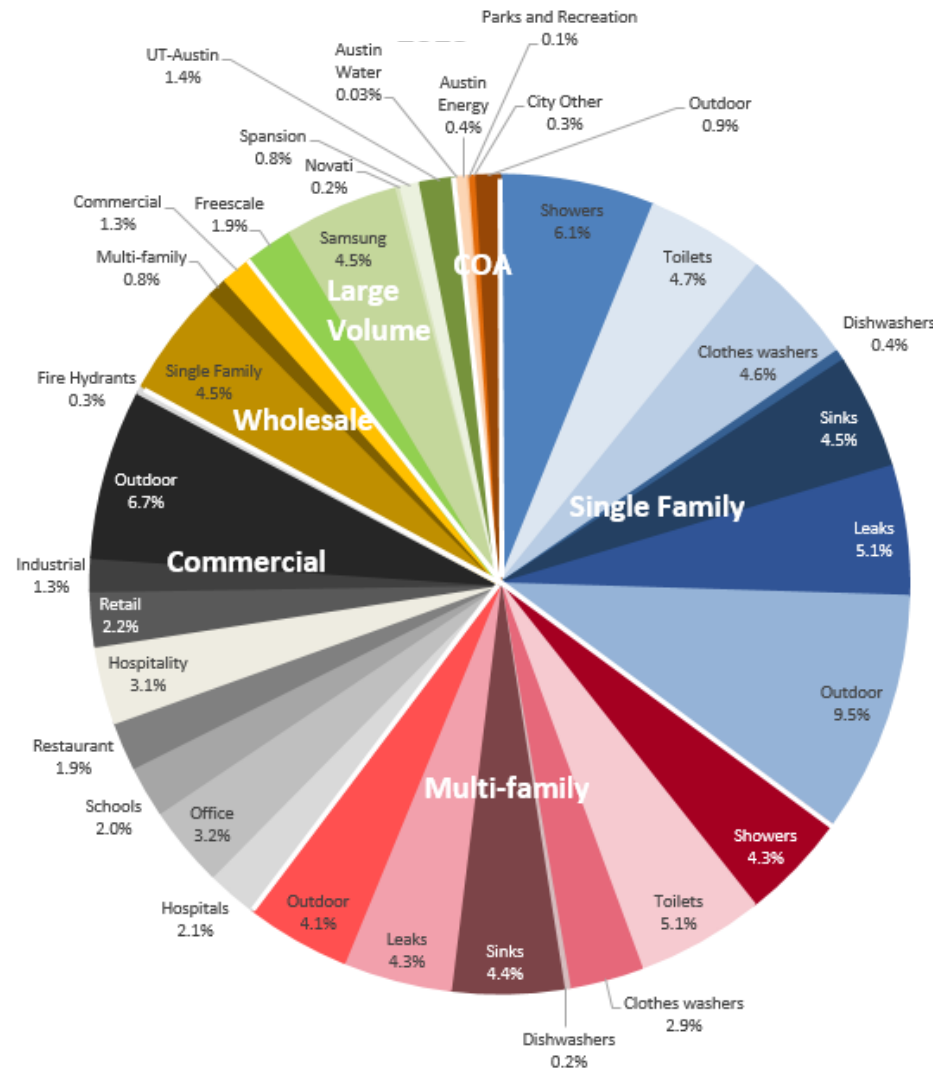
2013



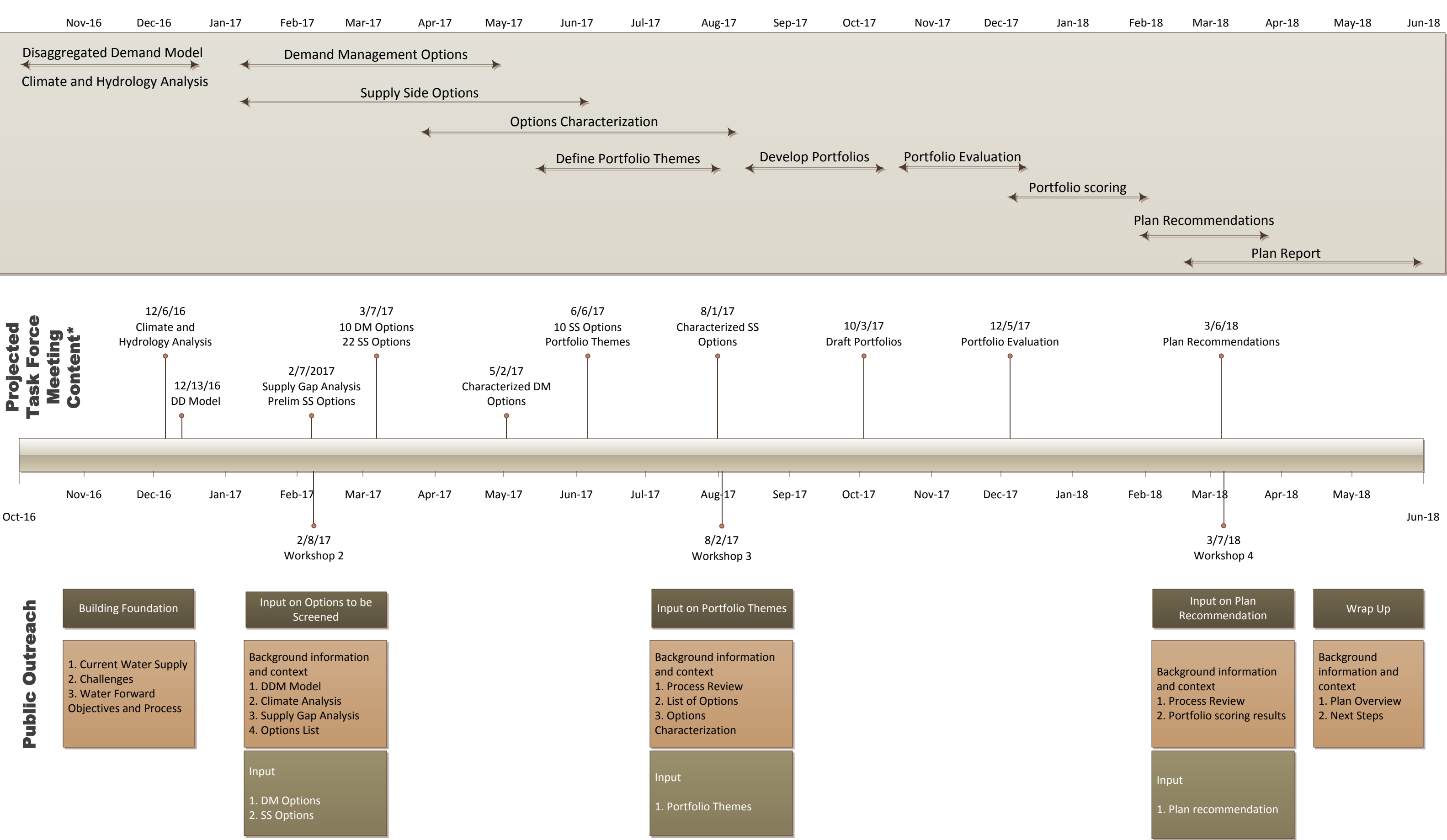
2014



## Historical Consumption



## Questions?



\* Subject to change- Does not show all Task Force Meetings

## Memorandum

To: Teresa Lutes, Austin Water

From: Megan Klein, Rifeline

Copied: Marisa Flores-Gonzalez, Austin Water

Date: September 22, 2016

Subject: Austin Water Integrated Water Resources Plan Workshop 1 Summary Report  
Task [Number] - [Title]  
CDM P/N: 0590-114879

On September 7, 2016, Austin Water hosted the first of four public workshops in order to collect public input for the Integrated Water Resource Plan (IWRP). This 100-year water plan will evaluate mid- to long-term water supply and demand management options for the City of Austin. The IWRP planning process will provide a holistic and inclusive approach to water resource planning.

The workshop gave stakeholders an overview of the IWRP, explained why a water plan is needed and outlined some of the elements of a potential plan. Stakeholders were then given a chance to offer input on the portfolio evaluation criteria for the IWRP. The workshop was held at the Waller Creek Center, located at 625 E 10th Street, Austin TX from 6:00 pm to 8:30 pm. Twenty-four members of the community attended.

## Outreach and Publicity

The event was publicized by Austin Water in the following ways:

- Austin Water emailed the following eNewsletter lists a notice about the workshop (see Appendix for invitation):
  - Water Forward (225 stakeholders)
  - WaterWise Residential List (16,792)
  - WaterWise Commercial List (145)
- Austin Water emailed invitations to groups and individuals on the Water Forward stakeholder list, including:

- Neighborhood associations
  - Businesses, developers, and professional organizations
  - Environmental advocates
  - Civic Leaders
  - Faith-based organizations
  - Education representatives
- Austin Water reached out to City Council members and engaged the IWRP Task Force.
  - Austin Water emailed the staff liaisons for the Water Wastewater Commission, Resource Management Commission (RMC), and the Environmental Commission.
  - Posted information to Next Door and Facebook and Twitter (see Appendix).
  - Posted information to the Water Forward website, <http://austintexas.gov/waterforward>.

## Presentation

Austin Water staff provided an overview of the background of Austin Water, the Integrated Water Resource Plan and the planning process, as well as future public outreach activities. The presentation highlighted:

- Austin Water's demand and population
- History, purpose and goals of the plan
- IWRP development process and public outreach opportunities

The Consultant team outlined the guiding principles of the planning process and discussed the Objectives, Purpose and Desired Outcomes of the plan on which the stakeholders would give feedback. A copy of the full PowerPoint presentation is available in the Appendix.

## Stakeholder Feedback

Stakeholders were asked to give their feedback at five stations, one for each of five Objectives including: water supply benefits; economic benefits; societal benefits; implementation benefits; and environmental benefits. At each station, a member of the project team facilitated a discussion to

discover what stakeholders liked about the Objectives, Purpose and Desired Outcomes, what the stakeholders didn't like about the sub-objectives, and if they thought anything needed to be added. A scribe captured their comments on flipcharts (see Appendix). Stakeholders were also given a survey that they could use to write comments that were specific to each Objective and Purpose and Desired Outcomes (see Appendix). A full list of comments for each Objective is included in the Appendix. The following sections provide a summary of the feedback received, categorized by Objective.

## Objective: Water Supply Benefits

**Purpose:** Sustain Austin's water supply reliability, providing resiliency for future population growth and climate change

**Desired Outcomes:**

- Minimize the number, duration and size of water shortages
- Maximize the certainty that the water supply will be available to Austin when needed
- With emphasis on local sources, enhance the diversification of water supply

**Feedback summary:**

The drought of the last several years was a major topic of discussion with regard to water supply. Discussion ranged from defining local sources to how we put a monetary value on water. The main recurring theme was the desire to plan for future shortages now. Stakeholders value infrastructure investment with an eye on conservation, safety, and water quality.

**Other key feedback themes for this Objective include:**

- Need for clarity of technical language (e.g., how do you define a shortage and over what period; what is meant by diversification)
- Climate change should be explicitly addressed
- Need for adaptability to address planning uncertainties like climate change

## Objective: Economic Benefits

**Purpose:** Develop water reliability solutions that are cost-effective for the Austin community

**Desired Outcomes:**

- Seek cost-effective solutions for improving water supply reliability

- Maximize advantageous external funding for recommended projects/programs

Feedback summary:

The majority of the discussion groups' feedback centered around two themes: affordability and how to plan for a 100-year time period. Affordability concerns included making sure rates stay affordable for families over time, with emphasis on low-income families. Stakeholders highlighted that cost-effectiveness can be viewed from multiple perspectives, including from the perspective of the ratepayer and the perspective of the utility, and costs should be communicated in a way that acknowledges this distinction. In terms of planning 100 years out, stakeholders suggested addressing cost uncertainties by incorporating future evaluations for re-assessing cost-effectiveness. During the discussion on all objectives, stakeholders mentioned maintaining flexibility, as technology and circumstances are expected to change over the 100-year time frame.

Other key feedback themes for this Objective include:

- Clarity around how cost-effectiveness is defined (over what time period, etc.) and how our community values water
- Interest in partnerships and potential funding sources
- Considering regional impacts and benefits upstream and downstream
- Clarity around the plan in general (what's the end product, how concrete will the plan be)

## Objective: Environmental Benefits

**Purpose:** Protect and sustain the local environment for the benefit of the Austin community

**Desired Outcome:**

- Sustain local watersheds and ecosystem health
- Seek lower energy-intensive solutions for improving water supply reliability
- Increase water use efficiency to reduce demands on potable water supplies

Feedback summary:

There were a few terms stakeholders agreed needed to be defined more clearly - "watershed" and "ecosystem health." Several stakeholders mentioned the idea of conservation and that in order for a plan to be successful, everyone in the community needs to know how they can conserve and how

water use and energy go hand in hand. There were also quite a few ideas about how water can be conserved, such as using native landscaping; capturing air conditioning condensate for reuse; expanding grey water use; and changes to irrigation systems.

Other key feedback themes for this Objective include:

- Taking a regional view (consider downstream impacts, good neighbor policy)
- Evaluation of net environmental impacts (including water consumption and waste generation impacts on base flow, aquifers, aquatic plant and animal health, etc.)

## Objective: Societal Benefits

**Purpose:** Provide societal benefits from improving water supply reliability for the Austin community

**Desired Outcomes:**

- Enhance livability and recreation through multi-beneficial water infrastructure/programs
- Protect and improve local economic vitality
- Seek social equity and environmental justice, with emphasis on underserved communities

**Feedback summary:**

Clarity and prioritizing environmental justice were recurring themes at the Societal Benefits table. For many stakeholders, the language was too vague or too technical. Some said the concepts of local economic vitality and underserved communities should be defined, for example. In addition, stakeholders noted the social benefits of the project should be more specific.

Other key feedback themes for this Objective include:

- Water quality should be included as a social benefit
- Societal impacts should stand alone from economic impacts
- Public health and safety are social benefits



## Objective: Implementation Benefits

**Purpose:** Reduce potential implementation challenges thereby increasing likelihood of success for projects/programs

**Desired Outcomes:**

- Achieve public acceptance and permitting/regulatory success, and reduce potential legal/institutional barriers
- Emphasize the scalability of projects/programs to better meet needs over time
- Seek projects/programs that have proven or tested technologies

**Feedback summary:**

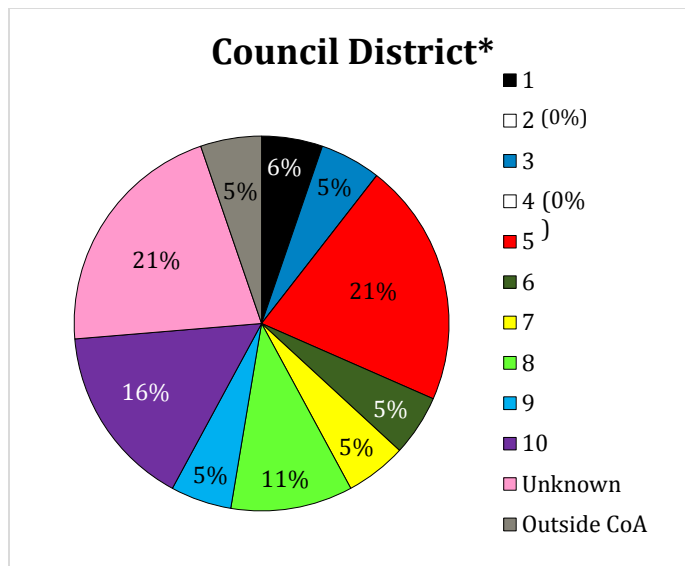
Stakeholders agreed that the implementation of the project should be innovative and raise the bar for other cities. Stakeholders felt the project should account for and embrace emerging technologies, especially in light of uncertainties inherent in planning a century in advance. Outreach and education were seen as key to the process of implementation.

**Other key feedback themes for this Objective include:**

- Clarify impacts and benefits to surrounding communities
- Minimizing public and private property impacts
- Recognize that regulatory and institutional frameworks have the potential to change over the 100-year planning horizon
- Transparency

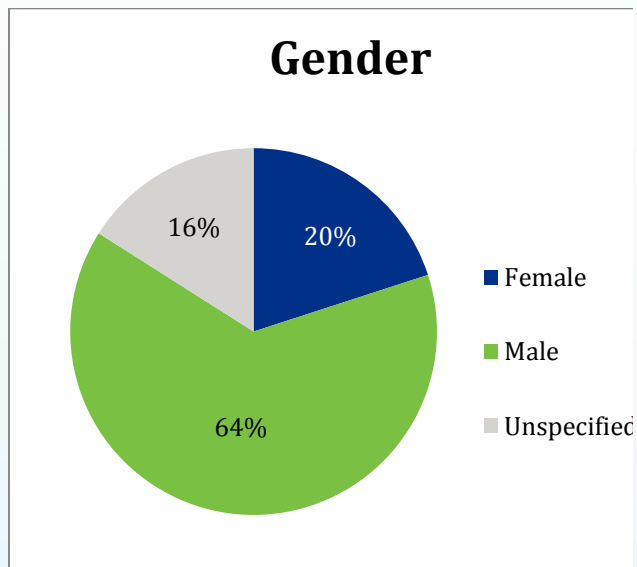
## Demographic Breakdown

Of the 25 surveys collected, the following demographic information was self-reported:



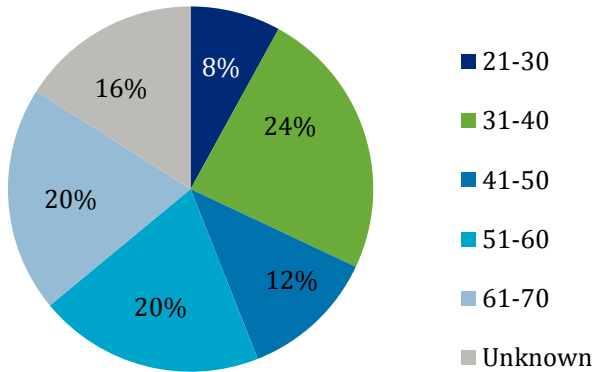
■ \* Five respondents did not know their district and so provided the list of ZIP codes below:

- 78702 (1)
- 78744 (1)
- 78751 (1)
- 78757 (1)
- 78759 (2)

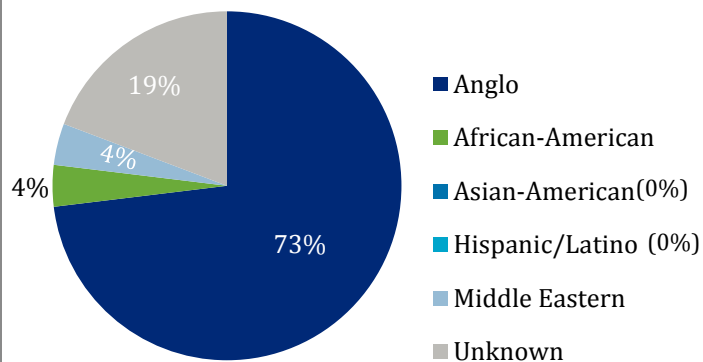


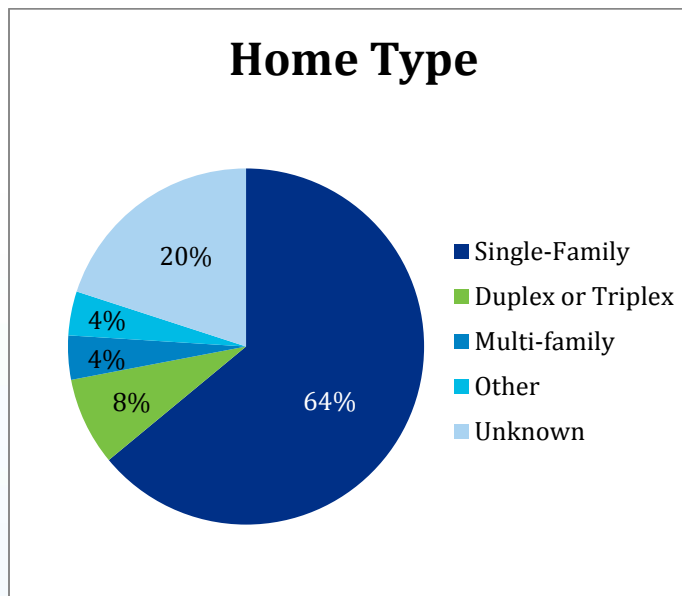
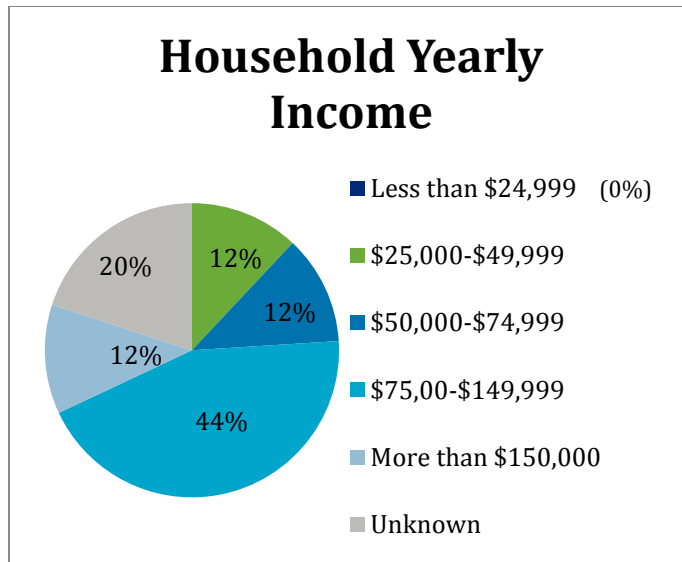


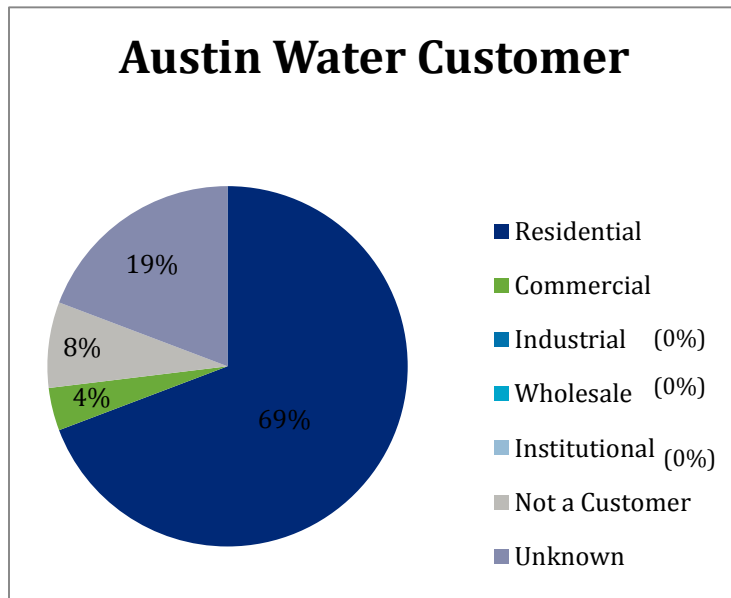
## Age



## Race/Ethnicity







## Next Steps

The next Workshop is tentatively set for February of 2017. In the meantime, Austin Water and the project team will strive to incorporate stakeholder feedback and find more avenues to collect feedback.

## Appendix

Invitation language

Social media invite screenshots

Sign in sheets

PowerPoint of presentations

Survey forms

Comment form scan

Flipchart photos

I'm here because.. Photo

Map photo

Photos of open house

Stakeholder list of those who were invited

## AW Draft List of 25 Demand Management Options

Options on this list have been identified as having potential for substantial water savings and were developed based on input from the Water Forward Task Force, other previous Task Force efforts, the Water Conservation Study (Maddaus 2015), other conservation studies, and Austin Water staff and the consulting team. The next step of the process is to conduct a qualitative-based screening process to identify the top 10 options for characterization. The characterization process for the top 10 options will include development of quantified water savings estimates.

1) Water Loss Control – utility side	
a. Enhance current water loss control programs	Austin Water currently implements utility-side water loss control programs (including leak detection, main break response, and water main replacements) and anticipates that additional savings could be achieved with program enhancements.
2) Automated Metering Infrastructure (AMI)	
b. Implement customer-facing programs that provide real-time water use information, including identification of customer-side leaks and other water-saving opportunities	Austin Water is currently conducting an AMI pilot program to test “smart meters” that electronically transmit water usage data, rather than being visually read by a meter reader. The pilot testing includes an interface portal that provides water use information to customers. Smart meters offer more timely data to encourage conservation and allow customers and the utility to monitor water use, including the ability to quickly identify water loss sooner and reduce the risk of meter-read inaccuracies. Preliminary project planning is underway for full-scale implementation using a phased approach.
3) Landscape Transformation Ordinances and Incentives	
c. Implement turf grass area, irrigated area, and/or irrigation system limitations	In May 2016, the City Council adopted a permanent one day per week watering schedule for automatic irrigation systems. Through landscape transformation ordinances and incentives, the focus would be to reduce irrigated areas for new development and to assist customers in complying with the watering schedule and maintaining landscapes appropriate to this region.
d. Increase WaterWise landscape rebates for residential and multifamily	Larger rebate amounts may increase participation in this program. Updated cost benefit information may be required for implementation.
e. Implement a new WaterWise landscape rebate for commercial	Commercial incentives implementation would include additional coordination with Watershed Protection on stormwater runoff controls.

4) Alternative Water ordinances and incentives (for rainwater, graywater, ac condensate)	
f. Incentivize and/or require on-site alternative water use for new developments	This strategy aligns with Watershed Protection's beneficial reuse of stormwater efforts. Potential onsite non-potable water savings for new development may depend on implementation approach and external drivers. Implementation may be facilitated by a balanced range of incentives and requirements.
g. Modify current rainwater harvesting rebate to encourage larger scale commercial systems	Increasing the \$5,000 cap per site may encourage larger commercial systems.
h. Offer an incentive to encourage the installation and use of graywater systems	This option would be a follow-up to the work done by the Graywater Workgroup that identified impediments to implementation of graywater systems. Council approved code amendments in Fall 2014 to remove impediments to installation of these types of systems while still protecting public health and safety.
i. Explore innovative building and plumbing requirements (such as dual plumbing) to expand non-potable use of alternative water sources	Focus on dual plumbing could expand non-potable end uses (such as toilet flushing) that can be provided by alternative water sources.
5) Irrigation efficiency ordinances and incentives	
j. Expand current rebate program for smart controllers responsive to leaks, high pressure, soil moisture, and rain	In May 2016, the City Council adopted a permanent one day per week watering schedule for automatic irrigation systems. The focus would be to assist customers in complying with the watering schedule and maintaining landscapes in a water efficient manner.
k. Incentivize retrofit of grandfathered spray irrigation systems to encourage more efficient irrigation systems	
l. Explore opportunities to eliminate the requirement for permanent automatic irrigation system installation for new commercial development	Advancement of this option would include additional coordination with Watershed Protection.
6) Water Rates and Fees	
m. Continue to explore opportunities to use Austin's fee and rate structures to reduce water use while maintaining affordability	Over the long term and in alignment with Imagine Austin, continue to explore ways to achieve additional water savings through Austin's fee and rate structures.



7) Development-focused water use estimates and benchmarking	
n. Require large building owners to report and benchmark their water use annually	This option would extend the current energy use and reporting program (ECAD – Energy Conservation Audit Disclosure) to water use in helping identify and achieve potential water savings.
o. Require pre-development water use estimate submittal for new development, to be reviewed by City staff for comparison to benchmarks. As part of this review, City staff will provide potential water use efficiency recommendations and information on available incentive and rebate programs.	A similar process currently exists in the Austin Energy Green Building Program, which applies to new commercial, multifamily, and residential development in certain designated areas of the city. This option would apply city-wide to new development and would focus on water use estimates and opportunities for efficiency.
8) Commercial, Industrial, and Institutional (CII) and non-residential ordinances and incentives	
p. Require AC condensate recovery systems for new commercial and multifamily	These options represent conservation best practices.
q. Require older cooling towers to meet water efficiency standards and use efficient equipment	
r. Require steam boiler and other water efficiency standards and equipment	
s. Require sellers of commercial property to provide written disclosure of non-compliant water using equipment or fixtures at point of sale to buyers and City staff	This option would extend the current energy use, reporting, and disclosure program (ECAD – Energy Conservation Audit Disclosure) to water use and would help identify and achieve potential water savings.
t. Require and/or incentivize swimming pool water use efficiency	This option would explore opportunities for implementing municipal and commercial swimming pool water use efficiency.
9) Plumbing codes and ordinances and fixture incentives	
u. Require or incentivize EPA Energy Star and/or WaterSense labeled residential and commercial fixtures and equipment	These options represent conservation best practices. These options would be in addition to existing requirements at the state level.
v. Incentivize or require toilet, urinal, and bathroom faucet aerator efficiencies.	

10) Reclaimed water ordinances and incentives (centralized purple pipe system)	
w. Expand current reclaimed system connection requirements or incentives for existing commercial cooling tower, outdoor irrigation, and other non-potable uses	These additional connection requirements or incentives will be considered separately from expansion of the reclaimed water distribution system (to be considered as part of the supply side options list).
11) Customer education and outreach programs	
x. Enhance customer engagement outreach and education programs	These options would enhance efforts on customer outreach and education.
y. Continue to enhance web-site and social media programs targeting customer water use efficiency	

			Option	Reference	Related Code, if applicable	Referenced to List of 25 Demand Management Options
A	Water loss control - Utility-side	1	Leak detection and reduction Continue and enhance efforts to reduce leaks and system losses from Austin Water Infrastructure	AWRPTF p.14 (2014)		a
B	AMI metering, information, and education including AMI enabled alerts	2	Implement Advanced Metering Infrastructure (AMI): Consider implementing customer-facing program that provides near real time water use and analytical data displays for leak detection and customer identification of other water saving opportunities	AWRPTF Appendix C (2014); Water Conservation Study (Maddaus 2015), TF Member Lauren Ross		b, x
		3	Irrigation systems must be a smart/ realtime reporting system that tracks use (and where AW can track use specifically for irrigation)	TF Member Sarah Richards		b, j, x
		4	Conduct an independent water savings assessment and cost/benefit analysis on whether to continue or modify the home water use reporting software program in advance of AMI implementation, including report delivery methods and in combination with and without "smart" meters, that may be provided at an additional service cost or incentivized until or if used in combination with Austin Water AMI that can provide customers near real time water use and analytical data displays for leak detection, comparisons with historical water use and similar and efficient households or facilities, and customer identification of water saving opportunities.	AWRPTF p. 14 (2014)		b, j, x
		5	On turf grass restrictions: if we are restricting turf use, seems like we should also specify what should be used for landscaping. Perhaps AW should rank options and provide incentives or disincentives to encourage best options for the environment? E.g. native landscape and/ or native grasses are top rated option, mulched beds next best, other alternatives like gravel are lowest ranked..	TF Member Sarah Richards		c
C	Landscape transformation ordinances an incentives	6	Require limitations on irrigated areas. Implementation options include: i) For new residential construction, limit irrigated area to not greater than 2.5 times the building footprint. ii) For new residential and commercial construction, limit the area that may be irrigated with automatic irrigation systems.	CWCITF O-NC-5 (2010); AWRPTF Appendix C (2014)	Land Development Code	c
		7	Require turf grass limit. Implementation options include: i) For new residential and commercial construction, limit the area that may be planted with turf grass. ii) Remove requirement that turf grass landscapes be installed before a certificate of occupancy may be issued.	AWRPTF p.18 (2014)	Land Development Code, Building & Fire Code	c
		8	Increase landscape rebate - Residential, multifamily	Consultant Team		d, e
		9	For all irrigation meters or cooling towers within 1,000 feet of a reclaimed water distribution line must connect to the line	TF Member Lauren Ross		w
D	Reclaimed water ordinances and incentives (centralized purple pipe system)	10	For every new subdivision etc. - require dual potable/ non-potable plumbing for outdoor irrigation and toilets [could apply to decentralized systems as well]	TF Member Lauren Ross		i
		11	All new developments that come within a certain distance of existing or proposed reclaimed water lines will be required to install appropriate infrastructure to connect to the current or future reclaimed water system. In the case of residential subdivisions, the developer will be required to install a reclaimed water distribution line in the street to provide irrigation water for each home.	TF Member Bill Moriarty		w
		12	Require installation of reclaimed water distribution lines in new residential subdivisions to provide irrigation water for each new home.	TF Member Bill Moriarty		Connectivity to implementation of reclaimed expansion on the supply side
		13	Explore the possibility of Austin Water delivering non-potable water to residences for irrigation use alone [could apply to some decentralized systems as well]			i
		14	All existing commercial sites with significant irrigation and/or cooling tower water demands, that are within a certain distance from existing or proposed reclaimed water lines, will be required to connect to the reclaimed water system	TF Member Bill Moriarty		w
		15	For[new] irrigation systems - require nonpotable use (or at least start moving in that direction). [could apply to decentralized systems as well]	TF Member Sarah Richards		l, h, f, g, p

# Blue Sky List of 65 Demand Management Strategies Referenced to Draft List of 25 Demand Management Strategies to Be Screened

1/17/2016

E	Commercial, Industrial, and Institutional (CII) and non-residential ordinances and incentives	16	For ICI customers, I think the cooling tower requirements could be much stricter, especially looking 100 years out. Cooling towers and hvac systems can be biggest users of water for these customers - could they be required to use nonpotable water or at least heavily incentivize that they are?	TF Member Sarah Richards		q, w, f, p
		17	As of a date certain, the seller of a commercial property must provide a written disclosure to the buyer of any non-compliant water-using equipment or fixtures on the property.	Austin Water Team	Energy Conservation Code	s
		18	All steam boilers shall be equipped with conductivity controllers to control blowdown, cold water make-up meters, and steam condensate return systems effective October 1, 2017.	WCTF IN 3 (2007)	Mechanical Code	r
		19	Offer a rebate for a high efficiency water broom that uses less than 1 gallon per minute.	Austin Water Team		r
		20	Swimming pool rehabilitation - municipal [where appropriate, focus on potable water use locations]	Consultant Team	CII	t
F	Plumbing codes and ordinances and fixture incentives	21	City-owned and commercial (including those operated by HOAs) pools shall be equipped with re-circulating filtration equipment and shall submeter the make-up water by a date certain. Pools with capacity of 50,000 gallons of water or less shall use cartridge filter systems or regenerative coated media filters. The cartridges shall be the reusable type. In-ground pools with splash troughs shall drain back into the pool system.	Austin Water Team	Water Conservation Code	t
		22	All cooling towers using potable water shall achieve a minimum of five cycles of concentration and have makeup and blowdown submeters, conductivity controller, drift eliminators and overflow alarms by January 1, 2018. Currently, only new and replacement cooling towers since January 1, 2008 are required to meet these efficiency standards and have this equipment.	WCTF IN-4 (2007); CWCITF ICI-1, ICI-3 (2010); AWRPTF Appendix C, p.2 (2014)	Mechanical Code; Plumbing Code	q
		23	Dipper wells in commercial kitchens/restaurants shall be equipped with flow restrictors and shall have a flow rate no greater than 0.2 gpm.	CWCITF ICI – 3 (2010)	Plumbing Code	u, r
		24	[require that?] All new toilets including dual flush toilets are required to have a maximum flow rate of 1.28 gpf, rather than an average flow rate of 1.28 gpf.	Austin Water Team	Plumbing Code	u, v
		25	Provide efficient toilet incentives. Options include: i) Provide a toilet retrofit rebate program for kits that retrofit an existing 1.6 gpf or greater toilet to a 1.28 gpf or less toilet. ii) Provide a toilet replacement rebate program for toilets that use on average more than 1.28 gpf (e.g. 0.8 gpf).	AWRPTF Appendix C (2014)		u, v
		26	Pre Rinse Spray valves may not use more than 1.28 gpm.	CWCITF ICI-3 (2010)	Plumbing Code	u, r
		27	Commercial and multi-family facilities must have water efficient toilets, urinals, and bathroom faucet aerators. i) Flow rates must be no more than 1.28 gpf for toilets, 0.5 gpf for urinals, and 0.5 gpm and 0.25 gpm (metered) for public bathroom faucet aerators ii) Options for implementation include upon resale or by a date certain and/or as a requirement to obtain a building or occupancy permit.	WCTF IN-1 (2007); AWRPTF 3.1.2 Appendix C (2014)	Plumbing Code; Building & Fire Code	u, v, s
(not including centralized reclaimed water)		28	New decentralized options – customer scale (such as rainwater harvesting and graywater reuse)	Austin Water Team		f, g, h, i
		29	In general, demand should be met first and foremost by graywater and / or water from decentralized collection if and when possible. Perhaps there is some overarching requirement that a decentralized system should be placed every XX acres throughout the city, and all ICI and developments should be required to use those waters to meet XX% (or a minimim # gallons/yr) of their water use annually or they are severely fined	TF Member Sarah Richards		f, g, h, i
		30	Require site plans for new development to include strategies for beneficial use of on-site sources of water and water reuse based on non-potable end use water demand.	CWCITF O-NC-4 (2010); Water Conservation Study, p.21 (Maddaus 2015)	Land Development Code	f, i, o
		31	Require on-site reclaimed system technologies and the beneficial use of reclaimed water, including rainwater harvesting, condensate collection, foundation drain water, recycled process water, or cooling tower blowdown, or a combination thereof, for non-potable indoor use and landscape watering to be incorporated into the design and construction of each new building with a roof measuring at least 10,000 square feet and based on non-potable end use water demand. (This item is the regulatory version of auxiliary water incentive program items included later)	AWRPTF Appendix C (2014); WCS, p.21 (Maddaus 2015)	Building & Fire Code	f, g, h, i, o, p, q, w

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1/17/2016

G	Alternative Water ordinances and incentives	32	Modify the current Rainwater Harvesting Rebate Program to encourage larger scale commercial systems and improve the utility's cost/benefit ratio.	WCS, p.21 (Maddaus 2015)		f, g
		33	For every new subdivision etc. - require AC condense reuse	TF Member Lauren Ross		f, p, o
		34	Newly constructed commercial and multi-family facilities installing air conditioning systems with a combined cooling capacity equal to or greater than 100 tons shall have a single and independent condensate wastewater line to collect and use condensate wastewater for beneficial purposes beginning October 1, 2017.	AWRPTF Report, Section IV. 3.1.2, pg. 13; Section VI, pg.18, Appendix C, pp 1-2 (2014); WCTF Report IN-4 (2007); CWCITF Report O-NC-1, ICI-13 (2010)	Mechanical Code	i, f, p, o
		35	For every subdivision etc. including retrofits - Require retention / reuse of all storm runoff through the 95th percentile storm based on a daily water balance and historical daily rainfall amounts.	TF Member Lauren Ross		c, e, f, i, l
		36	Offer an incentive to encourage the installation and use of gray water systems. These rebates could range from simple "laundry to landscape" systems, capturing untreated gray water from the bathroom lavatory sink, filtering and disinfecting it, and using it to flush a tank-type gravity-fed toilet, to large scale systems in new construction.	AWRPTF Appendix C (2014); Water Conservation Study, p.21 (Maddaus 2015)		f, h, i, x
H	Irrigation efficiency ordinances and incentives	37	For every new subdivision etc. - Require in-ground sprinklers to use drip rather than spray irrigation	TF Member Lauren Ross		k
		38	For every new subdivision etc. - have smart controllers responsive to leaks, soil moisture and rain	TF Member Lauren Ross		j
		39	Require annual audits of irrigation systems	TF Member Sarah Richards		n, x
		40	Minimize the type and number of customers that are permitted to even have irrigation systems	TF Member Sarah Richards		c, l
		41	Require use of soil moisture sensors for new automatic irrigation systems [to be used in alignment with the City of Austin watering schedule]	TF Member Bill Moriarty		j
		42	Incentivize use of drip irrigation over use of broadcast [in new] irrigation systems	TF Member Bill Moriarty		k
		43	Rebate for smart irrigation valve that cuts off under high pressure. Provide a rebate to residential and commercial customers for a "smart" irrigation spray valve that is installed in the base of each sprinkler head in a problem watering zone(s). Within each valve is a toggle that turns the valve on or off when triggered by water pressure. By installing some valves in the "on" position, and others in "off", the irrigation zone is effectively sub-divided into independent subzones. Then, using the "A" and "B" programs (found on most irrigation system controllers) property owners can adjust each subzone to function for a unique time period for areas with different watering needs due to vegetative type, soil depth or slope, or exposure to direct sunlight, thereby better managing total water use.	WCTF OU-5 (2007)		j, x
		44	Require irrigation sub-metering for new residential, multifamily, commercial, industrial, civic and educational [note that this is currently required for all non-single family residential facilities]	TF Member Ross		m, x
		45	Require all commercial and multi-family facilities to install a separate irrigation meter. Currently, only new commercial and multifamily facilities since December 16, 1999 have this requirement (Water and Wastewater Design Criteria, Utilities Criteria Manual).	Austin Water Team	Code, Water and Wastewater Design Criteria, Utilities	m, x
		46	Provide a rebate to residential customers for acoustic sensors to detect water leaks in irrigation systems. If the collected acoustic data is beyond the preprogrammed acceptable threshold, it would transmit this to the controller to shut off the system.	Austin Water Team		b, x
		47	Differentiation made between spray irrigation and drip irrigation to protect tree canopies and slab movement on some soils	TF Member Diane Kennedy		k
		48	Explore opportunities to eliminate requirements for permanent automatic irrigation system installation for new commercial development	Austin Water Team	Land Development Code	c, l
		49	Offer a rebate to residential customers to permanently cap and/or remove their automatic irrigation systems.	AWRPTF 3.1.2 Appendix C (2014)		c, d

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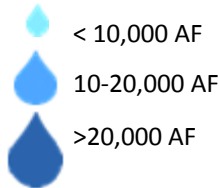
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		50	Provide a rebate to residential customers for a "smart" irrigation controller mobile app that can detect leaks and turn off fixtures, appliances and irrigation systems or automatically adjust irrigation schedules due to rainfall and soil moisture information.	CWC ITF O-EC-9 (2010)		j
		51	Expand current rebate program for smart controllers responsive to leaks, soil moisture and rain to include residential	Austin Water Team		j
		52	Incentivize retrofit of grandfathered spray irrigation systems to encourage efficient irrigation systems	Austin Water Team		k
I	Rates and Fees Incentives	53	Explore ways that meter sizing and impact fees could potentially be a mechanism to incentivize reduction in water use.	Austin Water Team		m
		54	Continue to explore opportunities to use Austin's fee and rate structures to reduce water use while maintaining affordability	Imagine Austin Comprehensive Plan (2012, page 191), AW		m
		55	Implement an allocation-based conservation rate structure depending on weather data, number of residents, and/ or business type and use. [---> see Imagine Austin p. 191 "Continue to use Austin's rate structure to reduce water use while maintaining affordability... etc.]	TF Member Lauren Ross		m
J	Development-focused Water Use Estimates, benchmarking, etc.	56	Require owners of any building larger than 10,000 square feet (including residences) to report and benchmark their water use rating Austin Water each year using EPA's Energy Star or equivalent.	TF Member Lauren Ross, Austin Water	Energy Conservation Code	n
		57	For every subdivision etc. including retrofits - Condition re-zoning, Planned Unit Development and other similar agreements between the City of Austin and developers on meeting a project water budget	TF Member Lauren Ross		n, o
		58	For every subdivision etc. including retrofits - require all plans to demonstrate compliance with a project water budget as a condition of approval. The regulatory basis for project water budgets should be updated no less frequently than every three years	TF Member Lauren Ross		n, o
		59	For every new residence and multifamily/ commercial/ industrial/ civic/ educational site plan: specify a limited outdoor potable water budget. Require that the landscape plan (combined in-ground irrigation, plants, turf area, soil, rainwater harvest or gray-water reuse) be consistent with that budget. The regulatory basis for outdoor potable water budgets should be updated no less frequently than every three years.	TF Member Lauren Ross		c, n, o
K	Customer Education and Outreach Programs	60	Increase customer engagement, 1-1, surveys, etc.	Water Conservation Study (Maddaus 2015)		x, y
		61	Commercial: Improve marketing, expand outreach, use electronic forms to make process work to encourage more participation.	Water Conservation Study (Maddaus 2015)		e, u, v, x, y
		62	Increase marketing and engagement with largest water users. Conduct large projects with effective incentives and advancements, and save large amounts of water.	Water Conservation Study (Maddaus 2015)		e, u, v, x, y
		63	Add more photos to website and multimedia for customer appeal	Water Conservation Study (Maddaus 2015)		y
L	Other	64	Try coupon programs, such as car wash or purchasing efficient plants	Water Conservation Study (Maddaus 2015)		d, e
		65	For every subdivision etc. including retrofits - Amend section 25-2-144(B) of Austin's Land Development Code to read: "The purpose of a PUD district designation is to preserve the natural environment, conserve water, encourage high quality development and innovative design, and ensure adequate public facilities and service for development with a PUD,"	TF Member Lauren Ross		o


# Blue Sky List of Water Supply Options with Descriptions

Relative magnitudes indicated for each option are planning level estimates and may be refined through the IWRP process.



Relative Magnitude of  
Annual Supply (Acre-Feet)



Option	Brief Description	Est. Annual Supply
1 Aquifer storage and recovery (FEA 5)	Aquifer storage and recovery is a strategy in which water (ex: potable drinking water) can be stored in an aquifer during wetter periods and recovered for use during drier periods. Storing water underground can improve drought preparedness and reduces the amount of water that evaporates compared to water storage in open above-ground reservoirs. This type of strategy is currently being used by cities in Texas including San Antonio, Kerrville and El Paso. Exploring aquifer storage and recovery as a potential option was a recommendation of the 2014 Task Force and has been analyzed by Austin Water as part of Feasibility and Engineering Analysis #5 (Northern Edwards and Trinity Aquifers).	
2 Direct non-potable reuse (centralized reclaimed purple-pipe system)	Through its Water Reclamation Initiative (WRI) program, Austin Water provides highly treated wastewater effluent for non-potable uses such as irrigation, cooling, manufacturing, and toilet flushing. Austin's direct reuse (purple pipe) system currently supplies approximately 4,600 AF per year. The 25-year direct reuse system master plan includes a total of 130 miles of transmission mains to be constructed and an estimated annual use volume of 25,600 AF. Potential expansion beyond this amount may be explored as part of the IWRP process.	
3 Lake Austin operations (lake level variation)	This option is an operational drought strategy to vary the Lake Austin operating level during non-peak months (October-May) and after combined storage in the Highland Lakes falls below 600,000 acre-feet. This strategy would allow local usage to draw the lake down a maximum of three feet to be able to catch runoff from local storm events should they occur. This approach would allow for use of this runoff as opposed to excess runoff spilling over Tom Miller Dam to flow downstream. This measure was included as a recommendation of the 2014 Task Force.	

4	Stormwater and Rainwater Harvesting	This option involves the collection and reuse of rainwater or stormwater to meet appropriate end use demands. The implementation of this strategy is dependent on a number of factors including the catchment area, storage capacity, rainfall frequency, and water demand of the end user. On average, the Austin area generally receives about 32 inches of rainfall per year. This rainfall is not distributed uniformly during the year and, as a result, implementation of this strategy should consider water demands and supplies over a multi-month period. This option is being analyzed as part of Task 6.3.	TBD
5	Sewer mining (wastewater skimming)	This option involves the extraction (mining or scalping) of wastewater from the centralized sewer system, treatment at a small local facility, and reuse to meet non-potable demands. Implementation of this strategy is highly site-specific, dependent on factors including accessibility of wastewater flows and proximity to suitable non-potable demands, with drivers being to minimize potable water consumption and infrastructure upsizing. Wastes from the treatment process are typically discharged to the centralized sewer system for subsequent treatment at the downstream Wastewater Treatment Plants (WWTPs). This option is being analyzed as part of Task 6.3.	TBD
6	Distributed wastewater systems	This option involves the onsite capture and treatment of the wastewater stream generated in a building or development for reuse to meet non-potable demands onsite. To be feasible, this option requires that a building or development have sufficient non-potable demand to beneficially use all of the reuse water that is produced and that the building have enough wastewater available to reuse and meet non-potable demands. Types of treatment systems may include constructed wetlands (for example the "Living Machine" at SFPUC), membrane bioreactors, etc. This option is being analyzed as part of Task 6.3.	TBD
7	Capture Lady Bird Lake Inflows (FEA 4)	This option would Capture available spring and stormwater flow into Lady Bird Lake and convey the water to the Ullrich WTP through a potential new intake pump and piping system. Exploring capturing Lady Bird Lake inflows as a potential option was a recommendation of the 2014 Task Force and has been analyzed by Austin Water as part of Feasibility and Engineering Analysis #4.	
8	Indirect reuse – bed and banks	Recapture discharged treated effluent from Austin's Wastewater Treatment Plants downstream to be pumped back upstream for treatment. City of Austin and LCRA have applied jointly for the water right permit for indirect non-potable reuse in accordance with the terms of the 2007 settlement agreement between Austin and LCRA.	Variable, subject to permitting, availability, and terms of the 2007 agreement



9	Indirect Potable Reuse (FEA 2)	This option would convey highly treated reclaimed water from one treatment train at South Austin Regional Wastewater Treatment Plant to Lady Bird Lake and subsequently divert water by a potential new intake pump and piping system downstream of Tom Miller Dam to the Ullrich Water Treatment Plant to help meet City demands. This approach could supplement water releases from lakes Buchanan and Travis to extend water supplies during severe drought. This option was a recommendation of the 2014 Task Force and has been analyzed by Austin Water as part of Feasibility and Engineering Analysis #2	
10	Reclaimed Water Infiltration (FEA 3)	This option would convey highly treated reclaimed water from one treatment train at South Austin Regional Wastewater Treatment Plant to an infiltration basin within the Colorado River alluvium. After a minimum six month retention time, recovery wells and pump station would capture and transport the water to Lady Bird Lake. A potential new intake pipe and pump station downstream of Tom Miller Dam would convey the water to the Ullrich Water Treatment Plant to help meet City demands. This approach could supplement water releases from lakes Buchanan and Travis to extend water supplies during severe drought. Exploring reclaimed water infiltration as a potential option was a recommendation of the 2014 Task Force and has been analyzed by Austin Water as part of Feasibility and Engineering Analysis #3.	
11	Direct potable reuse	This option is relatively new to Texas and involves taking treated wastewater effluent, further treating it at an advanced water treatment plant, and then either introducing it upfront of the water treatment plant or directly into the potable water distribution system.	TBD
12	Desalination – brackish groundwater	Desalination is the process of removing dissolved solids from seawater or brackish groundwater, often by forcing the source water through membranes under high pressure. The specific process used to desalinate water varies depending upon the total dissolved solids, the temperature, and other physical characteristics of the source water but always requires disposal of concentrate that has a higher total dissolved content than the source water. Disposal may take the form of an injection well, evaporation beds, or an ocean outfall diffuser. Exploring desalination of brackish groundwater as a potential option was a recommendation of the 2014 Task Force	TBD

13 Desalination – seawater

Desalination is the process of removing dissolved solids from seawater or brackish groundwater, often by forcing the source water through membranes under high pressure. The specific process used to desalinate water varies depending upon the total dissolved solids, the temperature, and other physical characteristics of the source water but always requires disposal of concentrate that has a higher total dissolved content than the source water. Disposal may take the form of an injection well, evaporation beds, or an ocean outfall diffuser.



14 Enhanced Off-Channel Storage at Walter E. Long Lake (Decker Lake) (FEA 1)

If Decker Power Station were taken offline and Walter E. Long (Decker) Lake was no longer needed for electric generation purposes, this strategy would involve use of the lake as enhanced off-channel storage for water supply augmentation. Enhanced operations of Lake Long would allow more fluctuation in the lake level than current operations, up to approximately 25 feet. In concept, the strategy would allow water from Lake Long to be released to meet downstream needs, including environmental flows and other uses, which would otherwise need to be released from Lakes Travis and Buchanan. This strategy would require making improvements to increase the capacity to refill Lake Long through a combination of Colorado River water and reclaimed water. This option was a recommendation of the 2014 Task Force and has been analyzed by Austin Water as part of Feasibility and Engineering Analysis #1. Based on preliminary results from this analysis, potential for water quality issues and lower than expected yields have been indicated.



Not included on draft list based on previous processes and input:  
Imported Groundwater

AW Disaggregated Demand Model

PRELIMINARY MODEL RESULTS

Baseline Demand Scenario Results Summary- includes passive conservation savings but does not include any additional future active conservation strategies or future increased reclaimed water use.

		HISTORICAL				
		2010	2012	2013	2014	2015
MUNICIPAL DIVERSIONS SUMMARY						
Municipal gallons ->		47,238,945,321	49,244,558,226	46,154,578,363	44,650,482,732	45,350,430,231
Municipal Acre-Ft ->		144,971	151,126	141,643	137,027	139,175
PUMPAGE SUMMARY (gallons)						
Total Pumpage		45,337,537,000	47,015,326,000	44,806,616,000	43,775,225,000	43,834,370,000
CONSUMPTION SUMMARY (gallons)						
Single-Family		15,515,664,500	16,124,976,263	14,621,926,397	13,771,604,494	13,583,853,269
	Indoor	10,062,801,703	10,313,002,945	10,477,065,087	10,183,094,279	9,887,596,230
	Outdoor	5,452,862,797	5,811,973,318	4,144,861,310	3,588,510,215	3,696,257,039
	% Outdoor	35%	36%	28%	26%	27%
Multi-Family		10,057,728,300	10,029,571,945	9,829,794,256	9,646,519,792	9,818,339,839
	Indoor	7,825,683,700	8,220,957,149	8,209,770,691	8,132,094,595	8,231,180,380
	Outdoor	2,232,044,600	1,808,614,796	1,620,023,565	1,514,425,197	1,587,159,459
	% Outdoor	22%	18%	16.5%	15.7%	16.2%
Commercial		9,317,143,700	9,103,185,177	8,857,585,610	8,753,082,396	8,703,030,078
	Total Indoor Consumption	6,026,794,334	6,109,627,220	6,055,224,189	6,125,869,790	6,105,709,353
	Hospitals	914,462,993	824,233,609	804,992,926	806,345,494	802,971,473
	Offices	1,207,839,939	1,244,999,508	1,236,674,365	1,247,840,616	1,244,353,278
	Schools	870,836,521	807,764,967	782,716,414	775,414,736	785,885,272
	Restaurants	701,332,179	747,680,252	742,806,623	730,024,419	736,662,973
	Hospitality	1,006,954,521	1,108,188,489	1,152,563,162	1,179,134,985	1,192,381,200
	Retail	708,877,737	816,243,973	799,375,317	824,522,813	839,623,927
	Industrial	616,490,443	560,516,421	536,095,381	562,586,726	503,831,230
	Outdoor	3,290,349,366	2,993,557,957	2,802,361,421	2,627,212,606	2,597,320,725
	% Outdoor	35%	33%	32%	30%	30%
Wholesale		2,973,430,431	3,100,482,728	2,741,994,311	2,667,855,971	2,522,754,720
	Single-Family	2,114,069,000	2,198,180,140	1,910,915,346	1,859,811,734	1,731,775,686
	Multi-Family	275,295,366	322,753,509	280,033,148	286,026,325	301,827,035
	Commercial	584,066,065	579,549,079	551,045,817	522,017,913	489,151,998
Large Volume		2,679,335,900	3,326,677,512	3,291,153,755	3,096,786,817	3,400,995,046
	Freescale	644,931,500	622,107,171	650,053,849	715,276,755	724,963,929
	Samsung	789,991,700	1,563,413,020	1,611,936,449	1,430,857,175	1,750,388,236
	Novati	80,359,600	61,220,939	63,477,206	59,871,191	66,272,445
	Spansion	432,920,500	399,693,847	361,191,406	324,706,848	299,221,940
	University of Texas	731,132,600	680,242,535	604,494,845	566,074,848	560,148,496
City of Austin		1,361,749,500	780,983,354	739,424,351	701,992,777	645,115,200
	Total Indoor Consumption	668,505,000	314,637,169	298,821,074	318,352,716	300,797,642
	Austin Water	37,564,000	13,365,704	10,200,469	15,749,284	10,860,882
	Austin Energy	391,473,900	150,793,097	154,180,462	150,215,412	156,261,567
	Parks and Recreation	140,424,200	56,013,366	42,402,061	51,977,006	35,794,955
	Other	99,042,900	94,465,002	92,038,082	100,411,014	97,880,238
	Outdoor	693,244,500	466,346,185	440,603,277	383,640,061	344,317,558
	% Outdoor	51%	60%	60%	55%	53%
Fire Hydrants		80,129,900	134,514,237	179,023,712	165,121,719	127,106,859
Billed Unmetered		280,295,968	3,550,919	N/A	3,339,880	3,211,226
Fire Hydrant Use (% of Consumption)		0.19%	0.32%	0.4447%	0.4255%	0.3276%
Billed Unmetered Use (% of Consumption)		0.66%	0.01%	N/A	0.0086%	0.0083%
Indoor Sub-Total		30,236,551,068	31,385,384,723	31,074,029,106	30,524,054,168	30,449,033,371
Outdoor Sub-Total		12,028,927,131	11,218,557,412	9,186,873,285	8,282,249,678	8,355,372,866
Consumption Sub-Total		42,265,478,199	42,603,942,135	40,260,902,391	38,806,303,846	38,804,406,237
Acre-Ft		129,708	130,747	123,556	119,092	119,086
Miscellaneous						
Process Water		5,169,730,202	5,284,299,098	5,026,530,493	3,681,522,463	3,090,547,701
Non-Revenue Water	UU	167,086,619	72,076,765	N/A	37,225,956	41,595,245
	RL	3,867,859,439	3,258,511,274	N/A	4,878,015,126	5,862,768,723
	UARL*	3,970,928	4,019,017	N/A	4,116,792	4,136,081
	AL	1,021,687,792	1,052,164,116	N/A	869,928,603	850,155,468
% Loss: Diversions -> Pumpage		4.03%	4.53%	2.92%	1.96%	3.34%
% Loss: Pumpage -> Consumption		6.78%	9.38%	10.15%	11.35%	11.47%
Total Losses		10.53%	13.48%	12.77%	13.09%	14.43%
Total Consumption						
		47,322,112,049	46,986,694,290	40,260,902,391	44,591,473,531	45,558,925,673
Population		875,936	907,161	928,026	951,329	977,491
Employment		546,025	577,366	593,036	608,707	624,378

BASE YEAR	
2013-2015	
45,385,163,775	
139,282	
44,138,737,000	
13,992,461,387	
10,182,585,199	
3,809,876,188	
27%	
9,764,884,629	
8,191,015,222	
1,573,869,407	
16.1%	
8,771,232,695	
6,095,601,110	
804,769,965	
1,242,956,086	
781,338,807	
736,498,005	
1,174,693,116	
821,174,019	
534,171,112	
2,675,631,584	
30%	
2,644,201,667	
1,834,167,589	
289,295,503	
520,738,576	
3,262,978,539	
696,764,844	
1,597,727,287	
63,206,947	
328,373,398	
576,906,063	
695,510,776	
305,990,477	
12,270,212	
153,552,480	
43,391,341	
96,776,445	
389,520,299	
56%	
157,084,097	
3,275,553	
0.3992%	
0.0084%	
30,682,372,215	
8,608,165,276	
39,290,537,491	
120,578	
9,655,879,642	
3,932,866,885	
39,410,601	
5,370,391,925	
4,126,436	
860,042,036	
3.36%	
9.83%	
12.86%	
43,470,433,865	

1/17/2017			
DRAFT- Subject to Change			
PRELIMINARY PROJECTIONS (SUBJECT TO CHANGE)			
2020	2040	2070	2115
50,239,074,533	70,231,363,141	105,459,192,858	179,702,900,564
154,178	215,532	323,642	551,488
48,553,481,504	67,875,000,145	101,920,885,634	173,673,610,427
15,883,243,609	21,616,873,970	31,613,586,001	49,676,473,699
11,506,156,596	15,696,884,600	23,304,650,064	36,904,517,589
4,377,087,013	5,919,989,370	8,308,935,937	12,771,956,110
28%	27%	26%	26%
11,340,061,895	15,857,200,310	25,087,533,105	49,873,969,502
9,475,920,399	13,065,469,447	20,709,626,926	41,192,706,710
1,864,141,496	2,791,730,863	4,377,906,179	8,681,262,792
16.4%	17.6%	17.5%	17.4%
9,777,696,795	14,943,598,105	24,652,715,374	44,479,636,207
6,764,413,063	10,269,368,565	16,016,835,757	28,904,868,737
876,276,959	1,320,898,293	1,879,787,273	3,394,384,888
1,385,829,565	2,083,641,324	3,365,883,860	6,082,603,748
857,957,913	1,294,783,518	1,910,618,437	3,404,146,199
814,874,203	1,235,996,324	1,909,529,460	3,458,042,766
1,291,959,225	1,944,602,747	2,881,815,357	5,214,385,519
917,791,006	1,408,088,771	2,352,762,843	4,242,674,150
619,724,193	981,357,588	1,716,438,527	3,108,631,467
3,013,283,731	4,674,229,540	8,635,879,617	15,574,767,470
31%	31%	35%	35%
2,377,060,885	2,794,152,203	3,322,318,973	3,527,301,736
1,618,251,571	1,879,724,767	2,283,924,597	2,405,667,116
280,742,546	309,801,347	320,992,647	324,283,148
478,066,769	604,626,089	717,401,729	797,351,472
3,341,038,563	4,276,763,077	4,819,649,251	5,362,535,424
668,894,251	647,991,305	647,991,305	647,991,305
1,738,327,288	2,674,595,478	3,120,361,391	3,566,127,304
60,678,669	58,782,461	58,782,461	58,782,461
310,101,518	300,410,845	300,410,845	300,410,845
609,530,800	644,339,503	749,553,119	854,766,734
885,751,937	1,468,512,804	2,037,186,647	3,052,675,652
386,639,926	645,133,551	892,093,858	1,333,094,407
17,263,763	30,408,390	42,220,095	63,312,426
206,700,267	379,753,291	544,459,307	838,577,191
54,523,456	77,259,118	102,307,121	147,035,698
108,152,439	157,712,752	203,107,335	284,169,092
499,112,011	823,379,253	1,145,092,789	1,719,581,245
56%	56%	56%	56%
174,087,883	243,364,940	365,436,024	622,704,496
3,680,676	5,145,375	7,726,279	13,165,612
0.3992%	0.3992%	0.3992%	0.3992%
0.0084%	0.0084%	0.0084%	0.0084%
33,897,723,395	46,797,127,958	69,122,624,699	117,290,567,828
9,931,392,811	14,457,839,341	22,840,976,825	39,383,437,725
43,782,622,243	61,205,610,784	91,906,151,654	156,608,462,328
134,364	187,833	282,050	480,614
12,663,202,166	16,130,583,309	21,915,207,530	33,950,408,764
1,887,954,779	2,566,408,434	3,752,259,711	6,251,476,844
92,500,592	129,310,556	194,172,322	330,870,440
4,797,108,959	6,706,084,944	10,069,835,951	17,159,042,086
2,471,941	3,455,633	5,188,968	8,842,023
1,070,340,116	1,496,274,485	2,246,801,036	3,828,558,253
3.36%	3.36%	3.36%	3.36%
9.83%	9.83%	9.83%	9.83%
12.85%	12.85%	12.85%	12.85%
49,742,571,911	69,537,280,769	104,416,960,963	177,926,933,107
1,101,632	1,577,760	2,314,769	3,977,380
702,731	1,048,834	1,612,005	2,877,726

City of Austin Steam-Electric Demand				
YEAR	Water Demand (Acre-Feet)			
	2020	2040	2070	2115
Travis County	9,000	9,500	9,500	9,500
Fayette County	9,000	9,000	9,000	9,000
<b>COA Steam-Electric Demand Total</b>	18,000	18,500	18,500	18,500