

# WORKFORCE WEBINAR SERIES

## Technology Adoption

Office of Wastewater Management

Office of Water

U.S. Environmental Protection Agency

December 9, 2020

**We will start in a couple minutes.  
Thank you.**

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# Webinar Logistics

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- This webinar is being recorded
- Participants will be in listen-only mode
- To submit a question, use the Q&A function
- Presenters will monitor these questions and respond to as many as possible during the “Q&A” session at the end of the presentation.



- Webinar slides and recording information will be sent out to all participants following the webinar

# Having Audio Difficulties?

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- Call in to any of these phone numbers:

+1 253 215 8782 <or>

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**Webinar ID: 997 1879 2425**

# Opening Poll: Please indicate the sector that you work in:

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- Utility
- State or Local Government
- Federal Government
- Consultant
- Academia/Educator
- Other

If you do not see a poll window pop up, please use the **Chat function** to type in your answer.

# Water Sector Workforce at EPA

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- Reminders:
  - Check out our website for resources and updates:  
<https://www.epa.gov/sustainable-water-infrastructure/water-sector-workforce>
    - Workforce Initiative
    - Past Workforce Webinars
    - Coming Soon- Workforce Case Studies
  - Stay tuned for information on our next webinar (2021). If you are registered for this webinar you are automatically on the email list for future webinars!

December 9, 2020

# Technology Adoption: It's All About the People

Jim Horne, Sustainable Utilities Program Manager, U.S. EPA Office of Wastewater Management

December 9, 2020

# Technology Adoption: It's All About the People

Wynne Miller, Deputy Director, U.S. EPA Office of Wastewater Management



December 9, 2020

## Speakers:

### MCES:

- **Kim Borman-Krinhop:** Assistant Manager, Performance Excellence and Analytics
- **Scott Bowes:** Assistant Manager, Training
- **Tyler Naughton:** Business Systems Analyst
- **Todd Tokar:** Program Supervisor

### The Water Tower:

- **Kristan VandenHeuvel:** Strategic Director of Research and Engagement
- **Chad Wilbanks:** Strategic Director of Training and Technology

**Webinar slides and recording will be sent to registrants within a week after the webinar.**

# Metropolitan Council Environmental Services



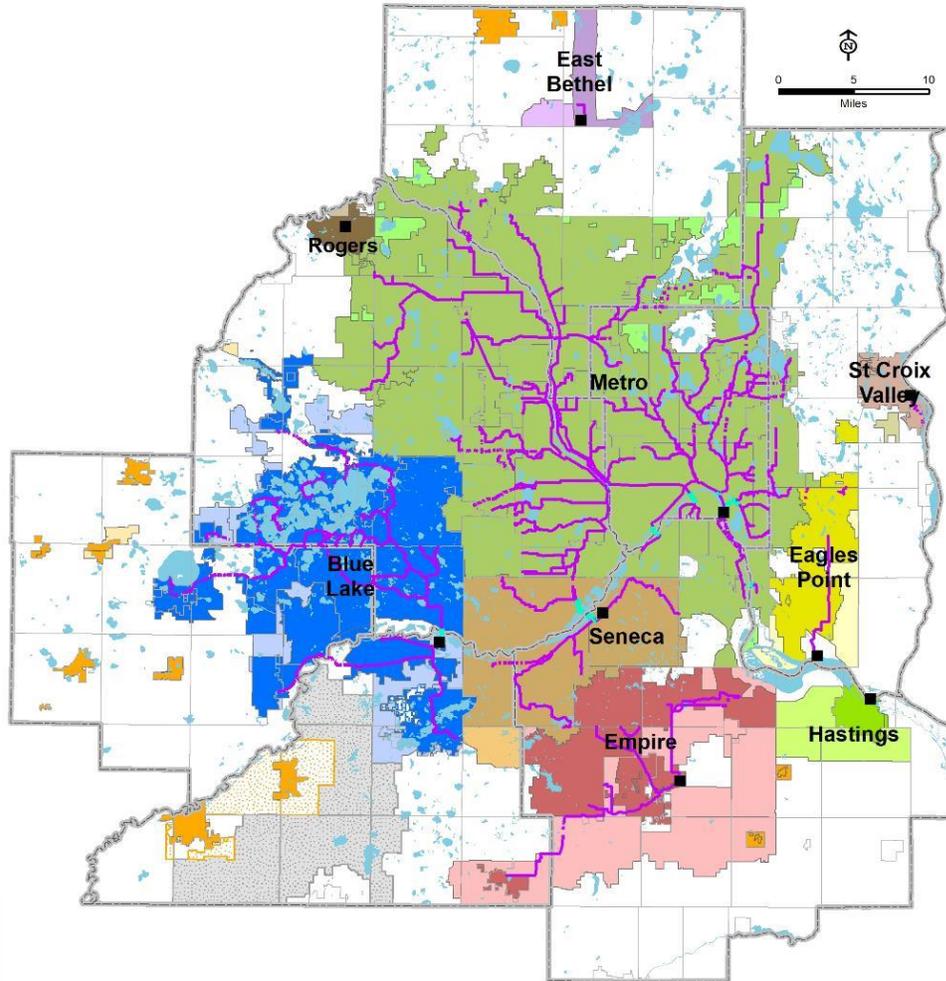
Protects public  
health and  
safety



Protects the  
environment



Fosters the  
economic growth  
of the region



## WHO WE SERVE

7-county Twin Cities Metro Area  
110 communities  
2,700,000+ people

## OUR FACILITIES

9 wastewater treatment plants  
640 miles of interceptors  
\$7 billion in valued assets

## OUR ORGANIZATION

600+ employees  
250 million gallons per day (avg)  
\$150 million / year capital program

Environmental Services Training Tech Focus:

# Piloting 3D Digital Twins, Augmented and Virtual Reality (ARVR) in Training Programs to Engage the Wastewater Workforce

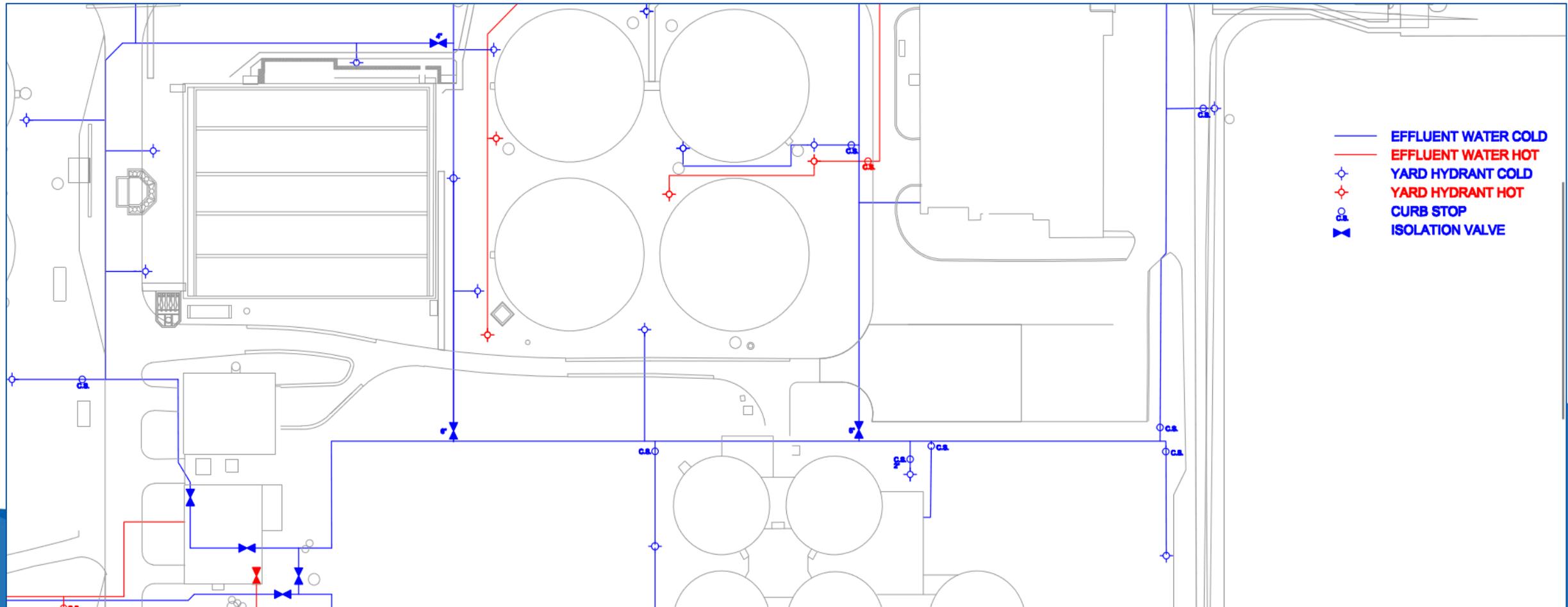
December 9, 2020

EPA: Technology Adoption: It's All About the People

George (Scott) Bowes, Kim Borman-Krinhop, Todd Tokar, Tyler Naughton,

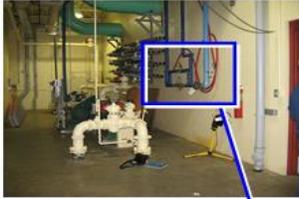


# How We Came to Explore Mixed Reality: The Story Begins

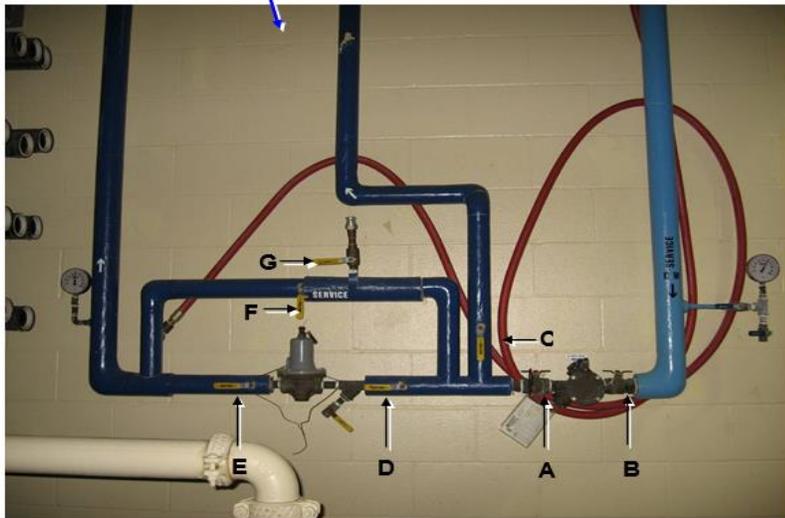


# How ARVR Benefits MCES

## 3. At the main water supply



- Close valve A, downstream of backflow preventer. This valve protects the water supply.
- Close valve B, preceding the backflow preventer.
- Check that valves C, D, and E are open.
- Check that valve F is closed. The main water supply is now isolated from the well water. This site supplies water to the RAS pumps and a remote water supply site, which provides water to the WAS and scum pumps. Once the hot water tank is isolated, this site will be ready for the effluent water to be hooked up.

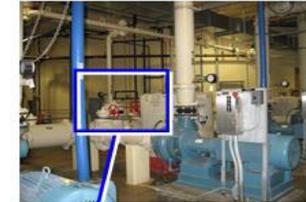


Main Water Supply

## 4. At the water heater next to the remote water supply,



- Turn off cold water supply to hot water tank by closing the valve marked "W". The hot water tank is now isolated.
- At the remote water supply site, check that valves H and I are open.
- Check that valve J is closed.



Remote Water Supply

# What are we doing, how are we doing it?

- Digital Twins
  - Replicas of plants, vehicles
  - Benefits: Safety, reduce trainer time, remote training



- AR Training
  - Beginning to explore
  - Potential Benefits: knowledge retention, reduce procedure creation time

# How are we involving our operations staff?

- Operations Staff
  - Involved in initial pilot of AR technology
  - Walking us through scanned areas helping name equipment
  - Helping test out procedures and tours of areas virtually
  - Request specific areas/projects in which to use AR or 3D mapping



# Challenges we are facing in adoption of ARVR thus far

- Wifi (AR Goggles)
- Storage
- Security
- Cost
- Transitioning to virtual training

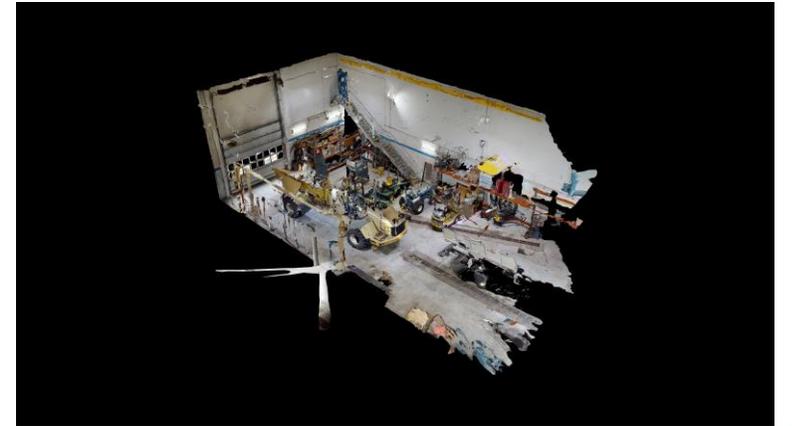


# DEMO: The best part

1. Eagles Point Wastewater Treatment plant 3D mapping
2. Video SOP combining the mapping technology with video
3. Vehicle mapping for training

Maintenance Lead:

The Vehicle mapping allows me to train more people at once and reduces the time needed in the truck.



# Lessons Learned and Looking Forward

- Lessons Learned
  - Adopting takes time
  - Involving all affected departments up front for buy in is helpful
  - Go for Easy Wins
- In the Future:
  - Increased 3D scanning
  - Creating easy access to the models
  - Create AR training pilots using the HoloLens
  - Create more plant tours and SOPS using mapping and video
  - Virtual Reality training

**Our Contact Info: Deb McKinley, Manager  
Program Administrator  
[Deb.McKinley@metc.state.mn.us](mailto:Deb.McKinley@metc.state.mn.us)**



# THE WATER TOWER

GLOBAL INNOVATION HUB @ GWINNETT

Kristan VandenHeuvel, Strategic Director of Research and Engagement  
Chad Wilbanks, Strategic Director of Training and Technology

# (Challenging) Water Utility World

Water Volatility

Aging  
Infrastructure

Increasing Costs  
and Decreasing  
Revenues

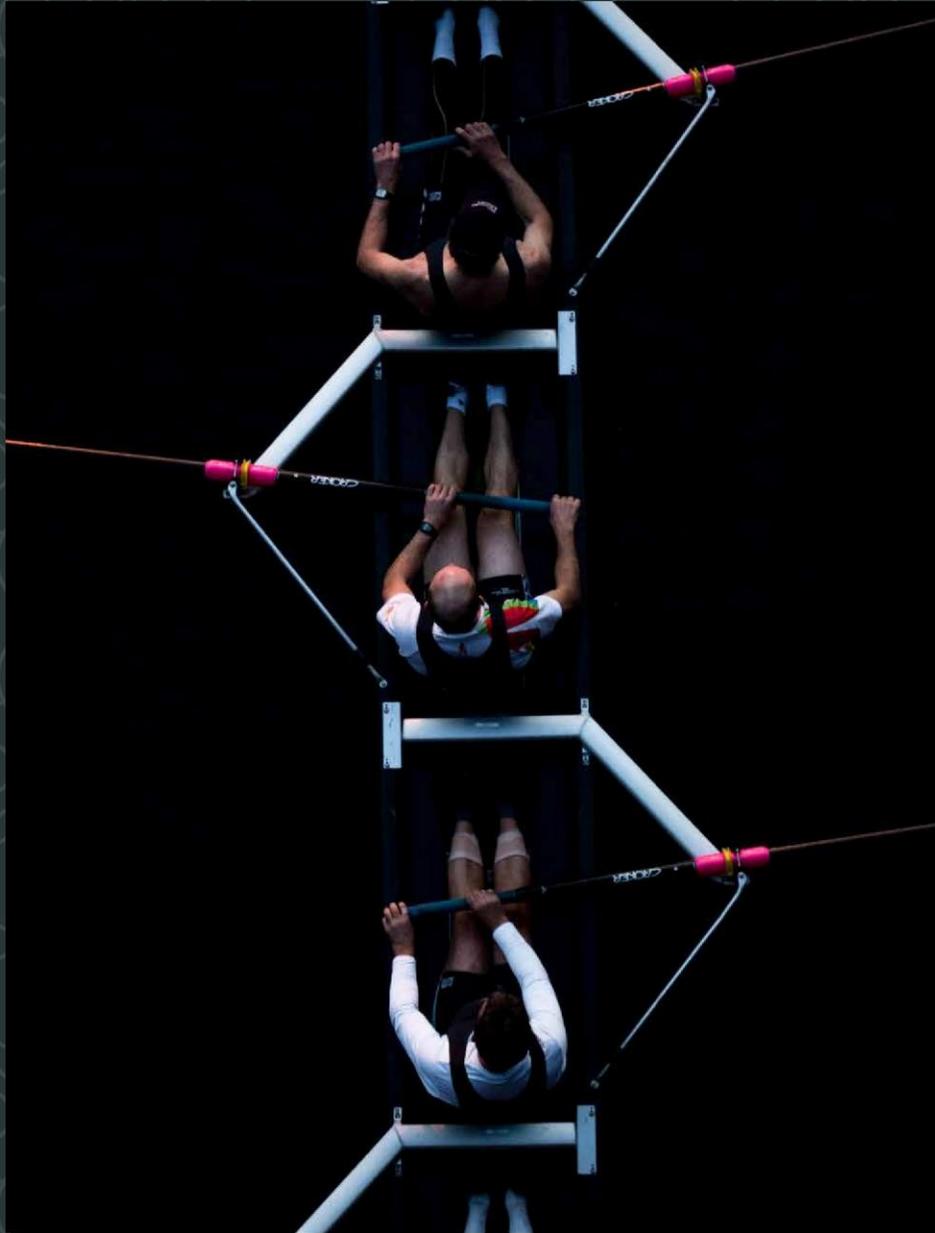
Increasing  
Customer  
Expectations

Aging  
Workforce

One Water –  
holistic water  
management



**THE FUTURE OF  
WATER DOESN'T  
HAPPEN WITHOUT  
COLLABORATION**





**SITE LEGEND**

- A** THE WATER TOWER AT GWINNETT
- B** FIELD TRAINING CENTER
- C** OPTIONAL FUTURE PHASES
- 1** FWAYNE HILL WATER RESOURCE CENTER
- 2** ENVIRONMENTAL AND HERITAGE CENTER

# Unlimited Opportunity

## Innovation & Knowledge Sharing: ROI



### INTERNATIONAL ACCLAIM

Ideas realized in Gwinnett are implemented across the world, impacting all major waterways and water utility providers



### NATIONWIDE

Word gets out – the WIC and campus become the go-to training ground for all of the United States



### SOUTHEAST US

The Southeastern states become a hot bed of water innovation and best practices



### GEORGIA

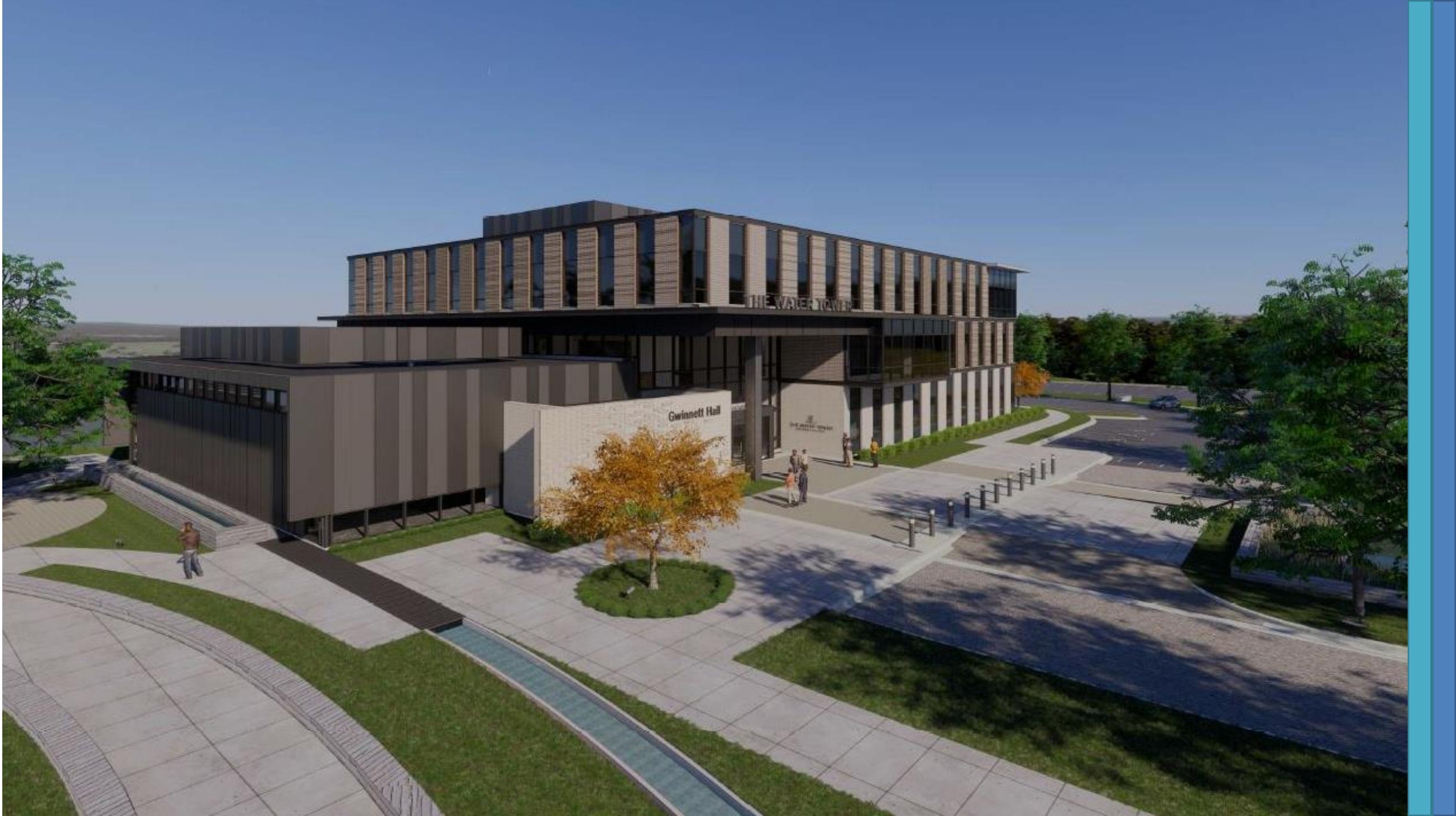
Trials of innovative ideas are expanded beyond Gwinnett to other counties in the State



### GWINNETT

Innovations are discovered at the WIC and environmental campus, and implemented in Gwinnett





THE WATER TOWER

Gwinnett Hall

THE WATER TOWER

# THE FOUR PILLARS

01

02

03

04



# THE FOUR PILLARS

APPLIED  
RESEARCH



02

03

04

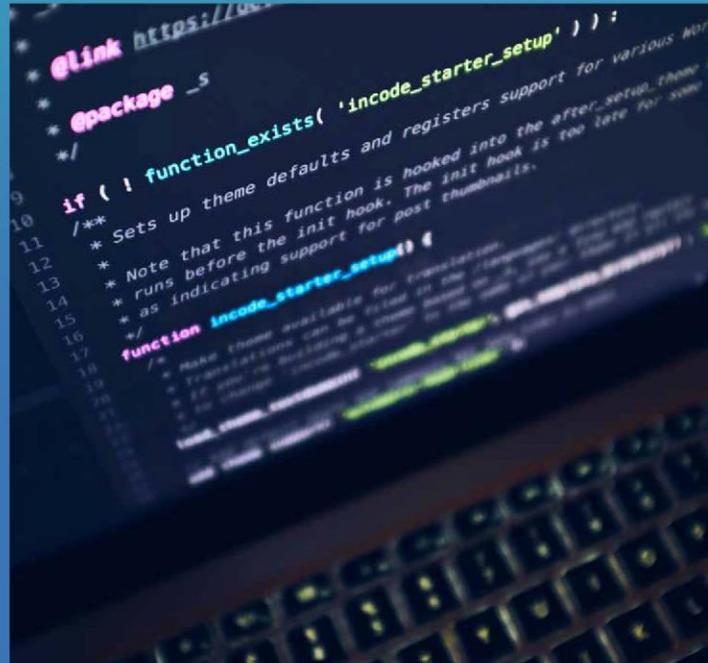


# THE FOUR PILLARS

APPLIED  
RESEARCH



TECHNOLOGY  
INNOVATION



03

04



# THE FOUR PILLARS

## APPLIED RESEARCH



## TECHNOLOGY INNOVATION



## WORKFORCE DEVELOPMENT



04



# THE FOUR PILLARS

## APPLIED RESEARCH



## TECHNOLOGY INNOVATION



## WORKFORCE DEVELOPMENT



## COMMUNITY ENGAGEMENT





## Integration of TWT's 4 Pillars

# Develop a Rigorous and Relevant Applied Research Agenda

- Conduct research to advance the science of water technologies that can be applied to real-world challenges faced by utilities – locally, regionally and nationally
- The initial Research Agenda will focus on the Lake Lanier Watershed; lessons learned from this initial planning process will be used to establish a process to expedite future planning



Action  
Items:

- Establish a Research Advisory Committee (RAC)
- Develop and Approve the Master Plan for Lake Lanier
- Identify Funding for Key Research Projects



# Engage the Community

- Be a beacon of community engagement, serving as a forum for the public to connect and learn about the value of water
- Priorities for 2020: Water Bar Truck, Model Water Community, distributed Water Tower Filling Stations, Youth Environmental Summit
- TWT will also host specific networking sessions throughout the year



Action  
Items:

- Establish a Community Engagement Committee
- Conduct Outreach Events throughout Georgia
- Secure Funding for Outreach Priorities
- Build the Brand



# Establish a Model for Technology Demonstration

- Lead the industry in demonstrating technology in real-time using actual process flows – the best way to vet performance of innovative equipment and processes

Action Item:

- Begin demonstrating technologies throughout utility assets
- Market demonstration visits





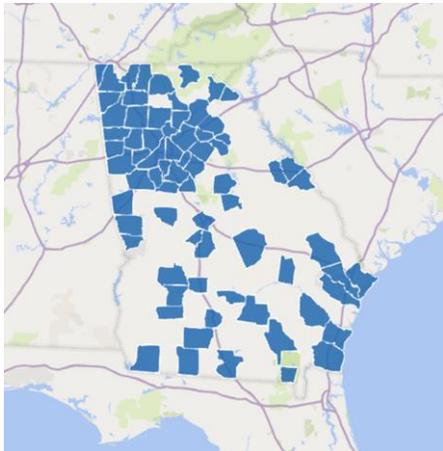
- Primary Influent
- Secondary Effluent
- Advanced Treated Reuse
- Digital Twin/APIs



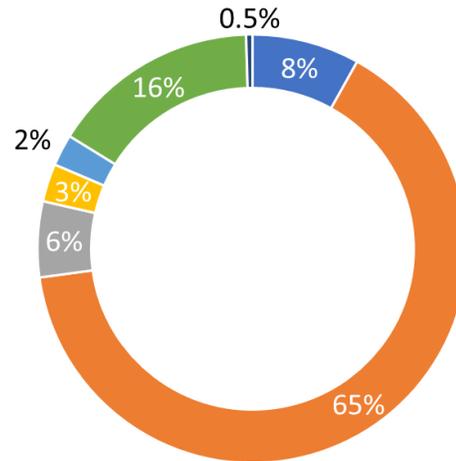


# Workforce Scan & Benchmarking

- 95/55 utilities
- > 210 Reqs

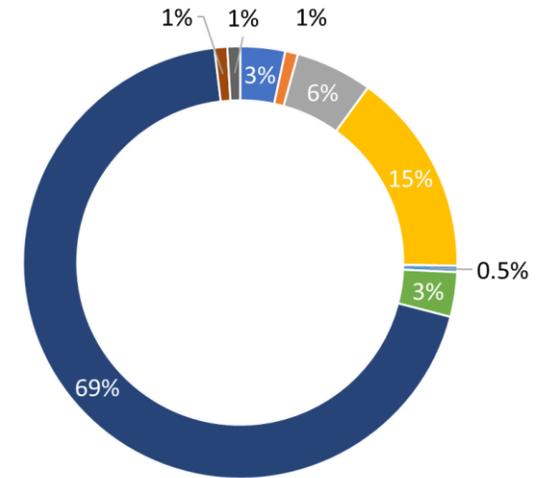


Education



- Not Specified
- High School Diploma or GED
- Associate's Degree
- Technical or Vocational School
- Currently Enrolled in College/University
- Bachelor's Degree
- Master's Degree and above

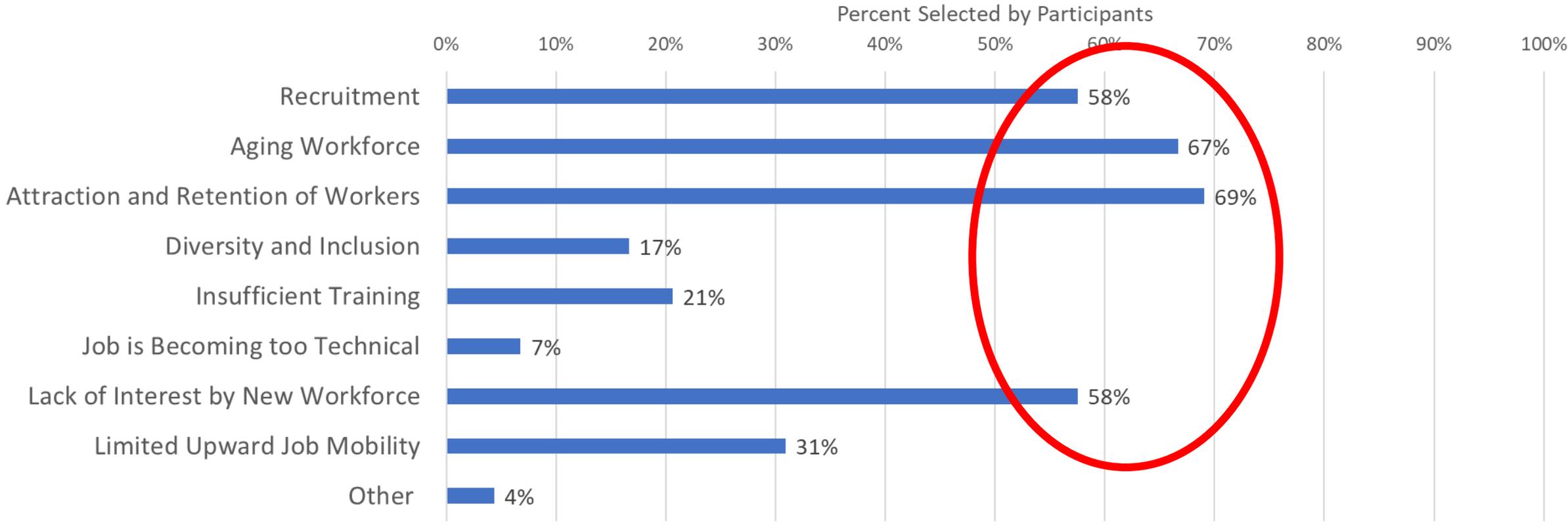
Department



- Administration
- Customer Service
- IT
- Operations and Maintenance
- Procurement
- Communications
- Engineering
- Management
- None

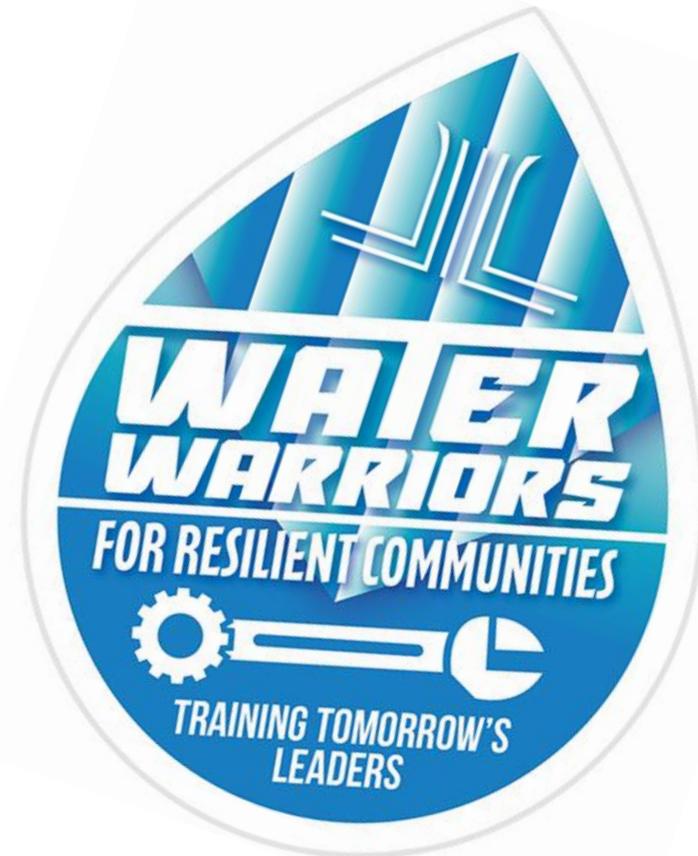


# Key Challenges



# Water Warriors

- Workforce Development for Resilient Communities
  - Community Based
- Blended Learning
  - Emersion
  - Exposure



# Build a World-Class Workforce Development Program

- Become a hub of high-quality training and professional development needed to develop a pipeline of next-generation workers for the water sector
- Programming will offer training through a range of credentialing, from GED to PhD; on-line, in person and in the field



Action  
Items:

- Develop Training and Professional Development Programming for 2020 and beyond
- Enhance Operator Training with field and study classes
- Enhance internship, apprenticeship, and Co-Op opps



# 2020-2021 Classes

Many classes in 2020 were canceled due to Covid-19. However, we were able to finish out our training calendar with the following classes:

- Wastewater Laboratory Analyst
- Maintenance Technologist II
- Water Operator Class II
- Wastewater Operator Class II Review

We are currently planning classes for 2021 in partnership with Georgia Water & Wastewater Institute (GWWI), part of Georgia Association of Water Professionals (GAWP)



# Testimonial



In partnership with GAWP, together we're making water and wastewater classes more accessible for workers in Northern Georgia. Below is a testimonial from one of our recent students.

"I would like to personally thank The Water Tower for their partnership with Georgia Water and Wastewater Institute and their continued focus on workforce development"

- Brandon, Recent student

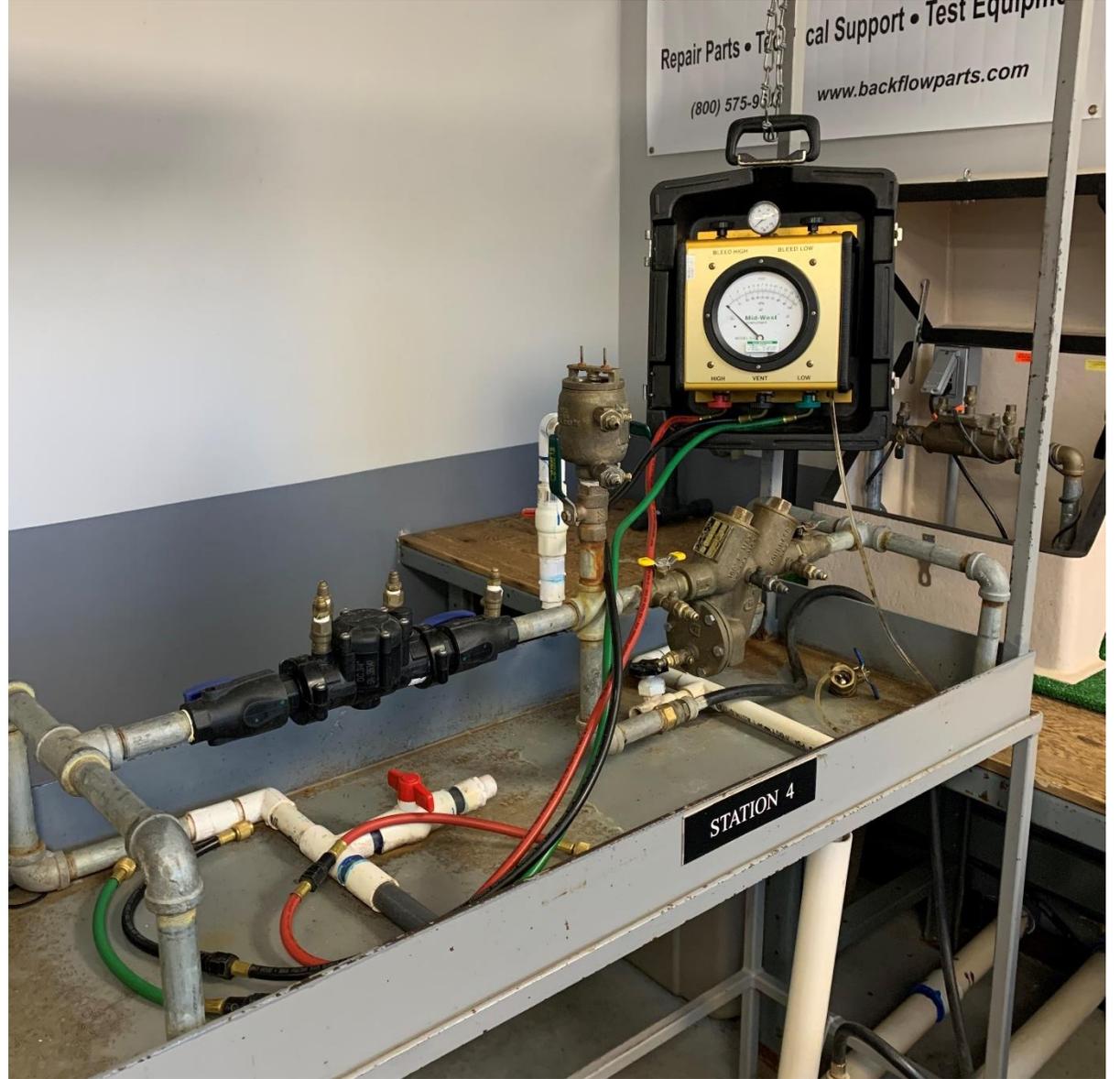


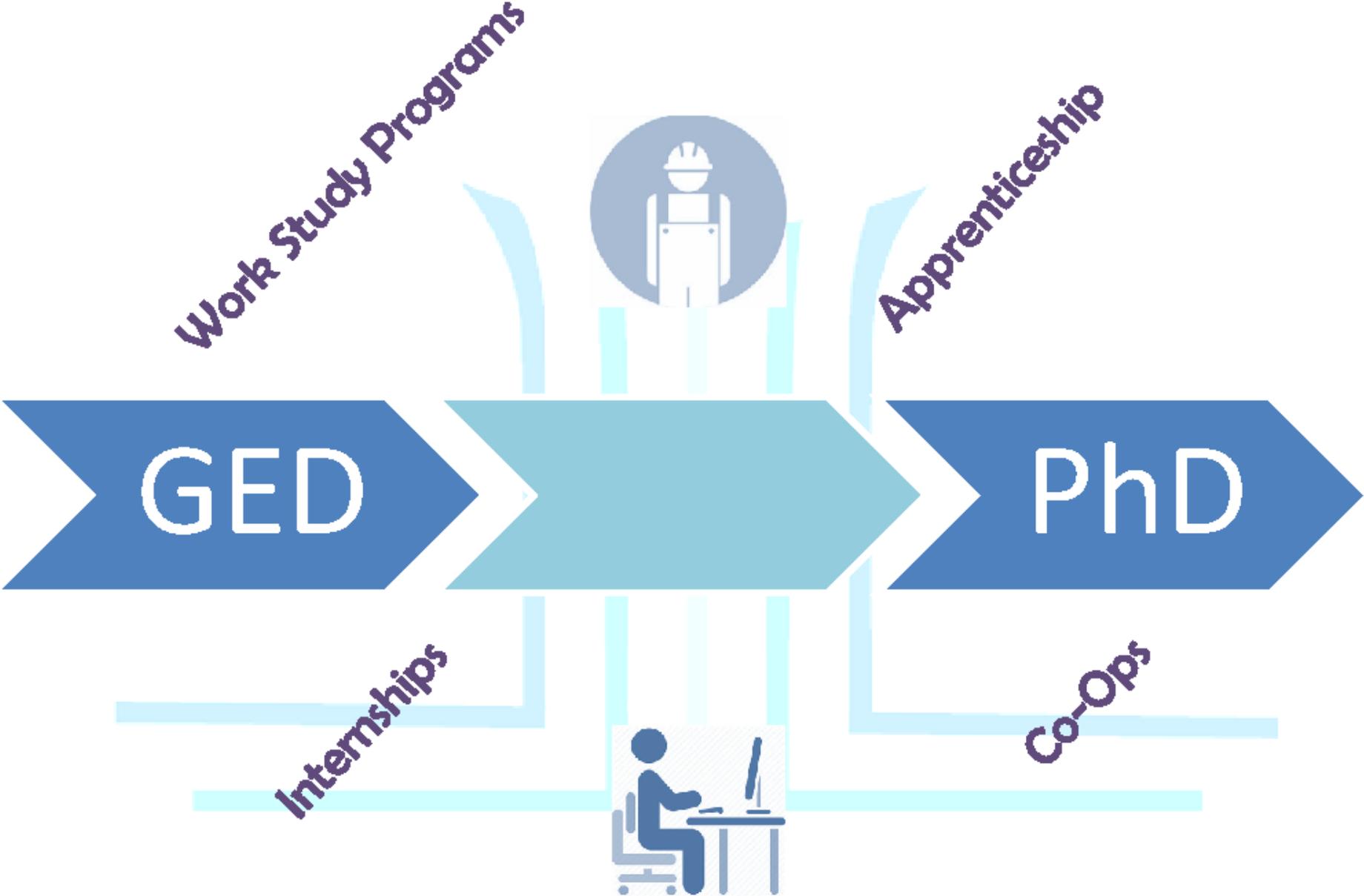
FUTURE SUGARLOAF PARKWAY R.O.W.



### KEY LEGEND

- A** PAVILION
- B** ADMIN BUILDING
- C** ANGLED PARKING
- D** MOCK UP RESIDENTIAL AREA- 12 UNITS
- E** COMMERCIAL DRIVERS LICENSE DRIVING AREA
- F** HEAVY EQUIPMENT YARD
- G** LAWN/ OPEN EVENT SPACE
- H** OVERLOOK TOWER
- I** GATED ENTRANCE/EXIT
- J** FILL UP STATION
- K** STORAGE
- L** DETENTION





# Lessons Learned

- Covid-19 presented many challenges for training while social distancing
  - Safety protocols, decreased class sizes, emphasis on online learning
- Engage partners to demonstrate their emerging, innovative technologies on campus
  - Exposure for tech providers to the water workforce (customers)
  - Practical training for students
- Need to address the "we have always done it that way" perspective
  - Demonstrate advantages of new technologies through real-world applications and results
- Make the water industry exciting! Engage the future of the water workforce in a creative way
  - Gamification, AR/VR, hands-on training



# TWT Collaborators

## Founding Partners



Global Water Works



## Interested Parties



# *Thank you!*

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Chad Wilbanks

Strategic Director of Training and Technology, The Water Tower

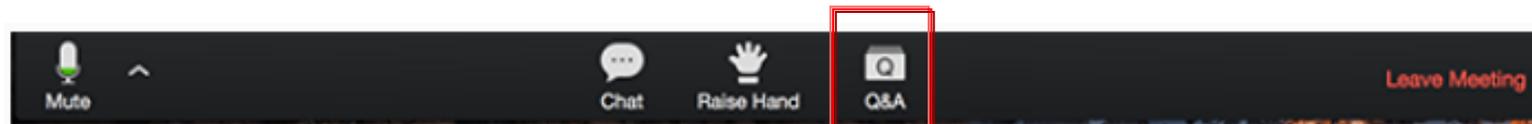
[chad@theh2otower.org](mailto:chad@theh2otower.org)

[www.theh2otower.org](http://www.theh2otower.org)



# Q&A Session

**Webinar slides and recording will be sent to registrants within a week after the webinar.**



# Closing Poll #1

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On a scale of 1-10, with 10 being the best score and 1 being the worst, how would you rate today's webinar?

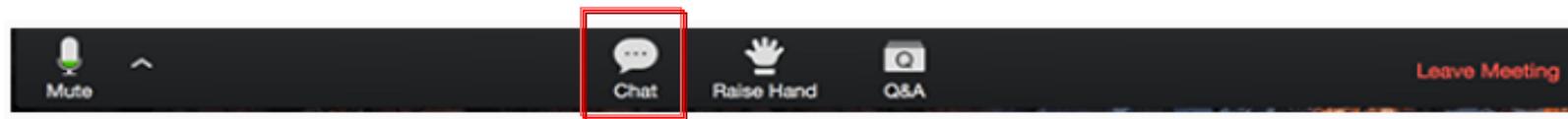
If you do not see a poll window pop up, please use the **Chat function** to type in your answer.

# Closing Poll #2

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Finally, what other topics would you like to see covered in subsequent webinars?

*Please type a brief response in the chat box.*



Thank you!

