

Maureen Erbeznik: Hello, everyone, we'll start here in a couple minutes, just waiting for participants to log in.

Hello, and welcome to the 2021-22 Better Buildings Webinars Series, bringing you the latest actionable insights from leading industry experts. This annual series is a chance to explore topics, technologies and trends that impact your organization. My name is Maureen Erbeznik, and I'm your moderator. I'm an industry water sufficiency consultant and serve as the water technical advisor for the Los Angeles Better Buildings Challenge.

Today we will be covering a few topics. First, we'll have a welcome and poll question. Then we'll have the four speakers presenting. We'll end with about 10 minutes of Q&A and do a wrap up.

Today's webinar is being run by the Better Buildings Challenge Multifamily Program. The Multifamily program is comprised of 90 partners with properties across the country. The vast majority of which are affordable housing. The partners commit to improve the energy efficiency of their portfolios by 20% over 10 years. You can learn more about the Better Buildings Challenge Multifamily Program by visiting the website listed here.

Next slide. Before we dive into today's session, there are a few housekeeping points I'd like to cover. Please note today's session will be recorded and archived on the Better Buildings Solution Center, will follow up when today's recording slides are made available. All attendees are in listen only mode, meaning your microphones are muted. If you experience any audio or video issues during today's session, please send a message via your chat window located on the bottom of your Zoom panel.

We'll be using the interactive polling platform Slido for Q&A and session feedback. Please go to slido.com using your mobile device or opening a window in your internet browser. Today's event code is #DOE. And feel free to send your questions or comments for our panelists by typing them into Slido anytime during the presentation. You can also upvote attendees' questions giving us the feedback on your most important topics and questions.

And then at the end of the presentations we will take questions. We'll be doing an audience poll in a moment. I'll pause briefly to give everyone a chance to open up Slido and select our session.

So, we want to learn more about you. Please join us on Slido and respond to the following question. How would you best describe your employer? Know that if you're having any issues, please message our tech team by using the Zoom chat.

Interesting. Looks like the majority of our consultants and contractors at 18% and then state and local government at 14, 13 out here at the top, affordable housing provider and state and local government. So quite a mix here. Great. I know everyone is going to get something from today's session. Next slide.

Today we're going to be talking about some very innovative and exciting opportunities for water use reduction in multifamily programs properties. Rising water costs have really hit property owners hard and particular owners of affordable housing. And they're expected to continue to rise. This coupled with increases in drought and water supply constraints makes today's topic super relevant.

For the past few decades, most water efficiency efforts at multifamily properties have been replacement showerheads aerators and toilets. These are great measures extremely cost effective, but there's so much more to do. Today we're going to go beyond the low hanging fruit. We have four presentations on new and unique strategies that may help you significantly reduce water use and improve the net operating income for your own properties. Next slide.

We have a great lineup of presenter today. We'll be hearing from Kevin Mulcahy, from AvalonBay Communities. Matthew Bower from Banyan Water, Nick Benz from Sensor Industries and John Skach from Atlanta Housing. To begin, I'm pleased to introduce Kevin Mulcahi from Manager of Energy Management at AvalonBay Communities. In his time with the company Kevin has led a water savings task force to reduce AvalonBay's impact on water stress with a focus on water-based irrigation control. Welcome, Kevin.

Kevin Mulcahy:

Thanks, Maureen. Hi, everybody. My name is Kevin as Maureen said, I'm from AvalonBay Communities. We can go to the next slide. Next slide. So, AvalonBay we're Real Estate Investment Trust. We have about 280 partner communities with over 85,000 individual units. We're in 11 states including DC, and we are the third largest apartment owner in the United States. Next slide.

So at AvalonBay, we have a commitment to sustainability. And in that is a large look at how we are affecting water stress across our entire portfolio. But especially in communities where we are seeing increased water stress like out on the West Coast. As you can find in our most recent PR report, we are very committed to lowering our total water usage. And with that we've been focusing mainly over the past few years on irrigation controls. We can go to the next slide.

So one issue that we've found with traditional irrigation, or some issues I should say is that a lot of the teams that work with them, they're just guessing how much they should run these systems. They're having to current day been a perfect science for this. So a lot of the time saying, oh, wake up in the morning, run it for an hour, turn it off. These systems also don't react or get any weather data sent to them.

There's typically no flow management or leak detection. So if something is going wrong with system, we have no idea and that can cause a lot of other issues like potential slip hazards, our parking lots and walkways getting flooded, slope erosion, and some other issues. Next slide.

The word smart irrigation and in our case, weather-based irrigation can do for us is really bring in this high precision weather data into our irrigation systems, meaning the controller itself will pay a weather station nearby and bring in what is happening to that point. That way we know, oh if it is going to rain, we don't want to water or if it had recently rained, we don't need to water.

We can adjust these schedules based on not only the weather information, but also soil information, what type of plants we have planting there, whether it be just your typical grass or water-resistant plants. It also gives us the availability to flow management and leak protection which in a lot of cases can give us or can help save us on our NOI when we have these issues.

We also are able to use cloud-based control so we can do it from anywhere in our portfolio. I'm in Arlington Virginia, but we have a lot of these systems out in California and I'm able to look and see how everything is working at the click of a button. There's mobile apps for on safety use, and our landscaper to use.

We receive weekly alerts, we receive monthly reports, and we are able to use all this app help track our budgets. Next slide. So we've done two phases of projects working with HydroPoint. And using

their weather track system. Our first phase was back in 2014, where we did 29 separate communities with 127 controllers, roughly \$750,000 invested. And in 2020 alone, we've seen \$494,000 in savings.

All these savings have come to less than a three-year payback period. In the development of these systems, we definitely had a lot of lessons learned. We want to pick a partner who has demonstrated customer service. And like I said, HydroPoint has done that for us. We needed a very hands-on and on demand team to deal with these issues.

So having a partner that can help us with those things, is 100% necessary. Having flow sensors and master valves, as I said earlier, is key because we need to be able to see these issues and stop them when they arise. Where we had those issues, we want to make sure that we have the budget money budgeted away, that way we can take care of them. These things can happen, it's inevitable.

So we really want to make sure that whatever comes we're ready for it. And ongoing training with our landscaping team, as well as our onsite team is essential. We want to make sure that with any turnover, they know how these systems work and what they need to do when they receive an alert. Next slide.

Next slide. Thank you. Our second phase was this year. We include the 33 more communities in this phase. We invested about \$1.1 million. And we're estimating the savings to be around \$337,000 with about an average payback of 3.4 years. Again, the proactive customer support is essential. Vendor monitoring and alert alarm status and escalating issues, that has been one issue that I never would have expected us to run into.

But we did have some installation problems with this set where we needed to get a more qualified vendor in to install and fix what was going on. Again, having a good partner to help facilitate that is key. The monthly and quarterly and annual performance saving reporting is also a big thing for us. We were originally just getting it quarterly but that only gives you a small insight.

Having it at a monthly and annual level gives you the granularity you need but also the big picture. And then again, vendor engagement continues trading for trade partners. It is so key to have your team and the vendors that you're working with knowing how these systems work, and how they're going to run every day. Next slide.

So in total, we have 61 communities, 315 separate controllers, about 1.85 million total invested and a projected 831,000 in savings annually. Choosing a partner, not a vendor, always choose someone who's going to be willing to work with you in the long run is essential. Required a commitment to ongoing training. Again, it cannot be said enough that you really want to make sure that we're training your teams and your landscaping vendors to know how these systems are going to run.

Require proactive and not a reactive customer support model. Again, if these systems will have issues as all irrigation systems do, we want to make sure that whatever we're doing, we are working as proactively as possible get these solved, and having a good customer support team is necessary there.

And then just continue to keep all vendors engaged, whether it be the irrigation controller vendor, your landscaping vendors, or whoever else is going to touch these systems is imperative to keep everybody all on the same page. Next slide. And I wanted to give one good case study in the Los Angeles region. This is our Toluca Hills property. We invested 66,000 in on this system with a rebate of 8,700 . The payback is about 1.4 years.

We haven't achieved it yet but that's because the system was put in this year. We have 11 controllers in 249 different zones. So it's a huge community. And that's why we really wanted to get in one of these systems just so we could be able to manage our budget and our water stress as best as we can. Next slide. And that's all I have. Thank you for having me, Maureen.

Maureen Erbeznik: Thank you, Kevin.

Kevin Mulcahy: And, yep.

Maureen Erbeznik: Great. Next, we have Matt Bower, the Executive Vice President of Operations at Banyan Water, water management software and services business. Prior to his time at Banyan, Matt lead operations at the energy conservation company synergistic. Welcome, Matt.

Matthew Bower: Thanks, Maureen. Thanks for having me. Appreciate it. I'm excited to present to the audience today. And hopefully the information is helpful and happy to take some questions and answers at the end of the fourth presentation today. Next slide, please. So Banyan has been in business for over 10 years located in Austin, Texas, and we have clients all over the United States.

We focus on water conservation for both outdoor and indoor use. We average about 40 to 60% savings for our customers. I think the question is, how do we do that? And it's really fundamental on two components. We install utility grade meters, and also proprietary controllers, that creates real time consumption information for our customers to make informed decisions. We also support our customers when anomalies occur or unexpected use happens.

And that's typically seen in two different ways. One main line or lateral line breaks or leaks. And number two is when consumption breaches the Evapotranspiration model, which is based on local weather plants, soil and slope types. But we don't believe that the solution is really only a software and I think Kevin made a good point. We also complement that software in tech, with onsite support to help train support our customers and make informed decisions.

What you see in the middle of this slide is what we call the Banyan Water Central. And this is the centralized command where you can find consumption information, you can find rate information, you can find your reporting mechanisms either quarterly, annual or monthly. And you can also find your mapping and inventory. So there's no more use for that three ring binder that's on the shelf collecting dust and changing all the time.

This is a very dynamic structure where you can see exactly what's occurring on the property. Next slide please. So these are our results to date. In 2020, for example, our customers experienced 505 leaks that we were able to respond quickly to shut off valves when it's necessary and get the repairs done quickly. Over 4 billion gallons saved for our customers equating to about \$36 million in increased customer asset value.

And on the right-hand side we're proud that we're part of the sustainability award for 2021. Next slide please. Eden Housing creates affordable housing communities throughout California. Water conservation is a part of Eden sustainability roadmap, and in 2018, we began our pilot with Eden at Josephine Lum Lodge and have had very good results.

This is located in Hayward, California where there are two controllers, two points of connection and 23 irrigation zones. The picture there is a map of the property and I'll explain what those highlighted orange areas of the property look like in our form. Next slide please.

So this is the performance at the top. 34% savings with nearly \$30,000 in cost savings, almost \$3 million in gallons and nearly \$3,000 in leak savings and that's calculated by the amount of response time that's reduced with real time monitoring for our system. The lower portion is a pretty extensive graph. But that black line traveling across is the baseline usage.

So we do a lot of data collection for customers to make sure we know what we're comparing ourselves against. That's a very collaborative process. But then we're begin to measure flow. And you'll see that that's the scheduled use in the blue with unscheduled use there and the yellow. What's interesting is that back in 2019, June, you'll see that consumption exceeded baseline conditions.

And that's because some of the infrastructure challenges associated with the property, we choreographed the repairs to get completed. And ultimately, were able to reduce consumption and maintain the health and integrity of the turf. Next slide, please. Here you see an interactive property map, I mentioned that this was the orange in the Eden housing project that we were implementing in. This is an interactive property map.

It's on your cell phone or your desktop, if that's where you would like to use it from. And what it allows you to do is click on each one of the zones of the property to provide some insights into what are the schedules, how much water has been going down?

What is the zone made up of from the landscaping and turf perspective, but it also allows the landscapers to use testing in remote locations and manually run the system if they need to. What this allows you to do is continue to keep that updated inventory, not just from a mechanical and infrastructure standpoint, but also what is the plant type at that location.

And is it going to go into more of a zero-scape type of efforts, this allows that dynamic nature to be captured in house in the nonpermanent situation. Next slide, please.

So this is the last slide that I wanted to highlight here. We talk about leak detections. Some of the leaks can really be very small in nature and hard to be picking up until you see the puddling on the landscaping in the property. So what we're able to do is inform our customers about when the leaks are occurring, where specifically they're occurring at the controller level, and even shut down if they want us to at certain thresholds.

So in an example of a 15 gallon per minute leak, we can remotely turn those things off to mitigate any damage. And also, this has been helping our customers in the areas of Florida and East Texas, and certainly Louisiana, where you have hurricanes and extreme conditions of storms coming in.

And we were able to shut off hundreds of valves within seconds of time to preserve the assets and mitigate risk for our customers. So those are the primary components of the things and I believe that's my last slide, Maureen.

Maureen Erbeznik: Thank you, Matt.

Matthew Bower: Thank you.

Maureen Erbeznik: Just a reminder to everyone go ahead and type your questions into Slido and we'll address them at the end of the session. Next, we have Nick Benz, the Director of Account Management at Sensor Industries. Sensor Industries is an Internet of Things company bringing new operational efficiency increased net operating income and water savings to multifamily communities. Welcome, Nick.

Nicholas Benz: Thanks Maureen. Morning, folks. So excited to be here and flattered to be part of this star-studded panel here. Like Maureen said, I work for Sensor Industries. We're an IoT company. And we focus on water conservation. We do both, solution providing but also implementation. Next slide please. Saves Water Increases NOI, this mantra actually packs a bit more of a punch than it might lead on saving water that's what gets me up in the morning.

That's what invigorates the job. And some days it's more powerful than coffee, which is a bold statement, I know. But increasing NOI is this notion that we've embraced over the years because it doesn't matter how great product is, it doesn't matter how much a CFO loves hugging trees or driving a Prius. If a product doesn't meet bottom line expectations, it's not going to get put into play.

If it can't increase net operating income or achieve a rapid payback, it's going to fall flat. And so we're excited and proud of a pricing model and customer success team that helps customers property owners, property managers save water and increase their net operating income. Next slide please. The public enemy number one for Sensor Industries, the challenge we've taken on is leaky toilets.

There's a number of adages I have that sort of elucidate what this problem is, but the gist of it is that everyone knows the leak, but they don't really know how much a toilet can leak and similarly, it's not hard to fix a leaky toilet but when you have 200 toilets under management at about one property, it's difficult to know which one is leaking.

And by helping our customers pinpoint these problems, know exactly what needs to be fixed when, where, how, we can deliver a sizable volumetric reduction to their water consumption. And this dovetails very well into the low flow toilet advent, which is a fantastic solution that solves a huge problem. How do we make toilets flush less water? But by sort of layering this solution on top, we're solving the problem of helping toilets leak less water. Next slide, please.

Traditionally, and still, Sensor Industries operates in B2B, Business to Business and business to customer formats. Happy to do that, we have teams that focus on that, but I'm here to talk about a really cool it's a novel and innovative partnership that we were a part of, where we brought a bunch of different parties together and deployed a very cool project in a low-income senior housing facility property in Los Angeles, California that's owned and managed by the Retirement Housing Foundation.

Next slide, please. So in this mechanism, there's a bunch of cogs, right? And they can be loosely described by a couple descriptors. So with any of these innovative projects, you're going to have a visionary, some sort of implementer or rather, initiator who wants this project to come to fruition, and perhaps they're focusing on a specific product that they want to see implemented.

So you have the product holder and the solution provider. And then you're going to need help with implementation and location sourcing. So now you have an implementer, and operator, property manager. And with all good projects like this, keep your water agencies in the loop. While I'm talking about a Los Angeles specific installation, water agencies across the nation are excited by innovative technologies and projects.

And at the very least want to know what's going on so that they can be kept abreast of what's coming into the field and how can we affect change, and what are our customers trying to combat and how are they doing it? In this case, in this mechanism, I am playing the role of Sensor Industries. And this is a role we've been playing recently, it's really fun, it's sort of playing this networking

cod, where we're able to pick part and parcel these concepts together to put together a cool project.

So California Water Action Collaborative, that was divisionary, Quack. We involved with them, by way of Pacific Institute Environmental Foundation. They wanted to see our product in action in an at need location.

And so Sensor Industries myself, we involved with our preferred partner Bottom Line Utility Solutions at the bottom here who helped us find an ideal property that could use this solution that could benefit from this solution and would showcase what can really be achieved in indoor water conservation.

And that ended up being a property at Retirement Housing Foundation. Sort of put a bow on top, I kept my colleagues at Metropolitan Water District in Los Angeles Department of Water Power involved from the beginning and said, "Hey, we're doing this cool project, what can we do to incentivize it and sort of keep you guys involved?"

Unfortunately, in this locale, there's performance-based rebates available that sort of pay it x cents for y gallons of water saved annually. And what this means is that, although Quack, was able to fund the whole project, which is fantastic, by helping subsidize a project with performance rebates, that means that there's more funds in the coffer to do projects later on, which is exactly what we're doing right now.

Next slide, please. So the project that I'm specifically talking about, and that's under live right now is MacArthur Park Tower. It's a high-rise senior housing facility in Los Angeles, it's got about 200 units, almost 200 toilets may use about six and a half million gallons of water a year. And our models predict that we should be able to help them sort of claw back or mitigate about 1000 gallons of unnecessary water waste annually, which is awesome. That's a great number to hit.

And it kind of goes – I mentioned my adage is one of these adages is that asking folks to water their lawns less or take shorter showers or don't wash their cars or behaviorally modified, they benefit from watering their lawn more, it's hard to get that involvement participation, but the leaky toilet no one benefits. And with this solution, maintenance teams just simply fix what needs to be fixed when it needs to be fixed.

There's no intrusion or expectation from the actual customer tenant themselves. There's sort of just a bystander, which is fairly novel. Next slide, please. So I've sort of talked about the company, the mission statement, I've talked about this cool mechanism that brought into action, which, by the way, might have looked like a lot of moving parts.

But honestly through setting boundaries, expectations, goals, and an abundance of communication, we took it to fruition really quickly, and we had parties involved that had never crossed paths before. And it was a lot of fun and this is something that Sensor Industries has been doing for about a year or two now. It's not just being a solution provider, but sort of networker and so we brought these folks to the table, put the project in action, and now it's underway.

And this product we're specifically talking about is a real time water leak and monitoring system. It's for the toilets, it goes on every toilet, the property and notifies maintenance team in real time. Hallway Bathroom Unit 412C Garden Villa Apartments is leaking 900 gallons of water today, it needs a new flapper, that sort of actionable real time data is where the rubber hits the road.

Again, if fixing toilets is easy, it's hard to know which ones need to be fixed, especially when you have hundreds of them under management. Next slide, please. Next slide, please. Thank you. So as a product, as a solution, it's twofold. There's a hardware component and there's a software component. The hardware component is admittedly the product that's being purchased.

But in the case of a 100-unit, 100 toilet sensor product or sorry, property, that installation would be completed in one day. And at that point, with our two-to-five-year lifespan batteries, a self-healing network, it's kind of a transient experience that's sort of in the rearview mirror. And now the customer focuses on the interface and the data.

And at the top, we can see our desktop dashboard. This is a great tool for the desk jockey like myself, who wants to do trending analysis and imperative studies across properties and portfolios. It's great for the person who wants to see that NOI bump in real time, they want to see that savings and water consumption reduction in real time. And it's a very powerful tool.

But admittedly, that's not always – those folks, myself included are not the folks that are affect to change. Those are the boots on the ground, people and we'll get to that in a second. Next slide, please. So, once we've implemented, once we've trained up the staff and gotten everything underway, now we're getting the live data. On all of our visuals throughout our system with the desktop app or the mobile app, there can be three main colors, red and yellow, which are leak types, and blue, which is flushes and without fail when we install.

We see this glaring amount of red and yellow and a very diminished amount of blue, telling us that toilets leak far more than a flush without fail across all of North America.

This is the story we learn. And so by getting this real time data with localized problems, you have a problem in this toilet right now, we can start issuing maintenance campaigns through our work order system. And by battling these toilets and fixing them and knocking them off each week, we get down to what I call the cruising altitude.

That sort of baseline plateau at the bottom there, and admittedly, you'll never catch all the leaks, it's got to leak in order to catch it. But if you can get down to that cruising altitude, that's where the savings take place. And that's where you're looking at sizeable reductions in unnecessary water overhead. Next slide, please.

The mobile app, that's what I was talking about in terms of the interface for the boots on the ground folks. This is a streamlined solution for tablets and phones, where maintenance techs, maintenance supervisors, et cetera, are getting a categorized list of these are the problems you're in charge of right now. This is where they are.

They can open it up and see relevant metadata, the whos and the whats and the wheres and what does this look like helping them diagnose the problem. And once they're able to engage with it and solve the problem, they can open up the work order, use a pre populate solution or add their own notes and close it out. And something really beautiful happens here that's kind of cool, almost social experiment type of ideology is we have accountability.

Suddenly, there's accountability for good data. There's a lot of great products that are only great if the users engaged with the data they're getting. And when we have that big mechanism, I talked about, we have visionaries, we have implementers, we have

fundes, we have solutions providers, property managers, property owners, when all these folks are seeing this data now. They all have access to this mobile app and web app.

They're going to see maintenance technician Nick closed out that work order at 11:30 a.m. on September 28th, the toilet was leaking 900 gallons of water a day, installed a new flapper and filled out and adjusted the chain. Suddenly, something really cool happens where we're able to award gold stars when they're needed for efficacious and quick responses. And we're able to award additional resources when it's clear that a team needs more help or more manpower.

Next slide, please. At this specific property, while it's only been underway for a few months, you've already seen a non-negligible reduction in water consumption. And just the first three days we saw that nearly half of the water going through their toilets was attributed to stuck wide open leaks. And this is a type of leak, we've observed where the toilet is flushed, and it remains in a flush state. It doesn't stop until someone intervenes.

But using the work order system, issuing maintenance campaigns, getting on top of the problems before their two-month water bill cycle comes up, we brought that number down or more importantly, MacArthur Park Tower and RHF brought up that consumption down from 44% to 11%. And it's going down even more, it's expected to get covered down to this low single digits.

And that's just in a couple months of being deployed. Next slide, please. So that's the solution, that's mission statement. This is a cool partnership we did and we are going to do more of them and I hope to take part in partnerships like this across the nation. Everyone is fighting this battle together, saving water. And if I can help you increase your NOI to make it happen, then that's great. So thanks, folks.

Maureen Erbeznik: Thank you, Nick. And last but not least, you will hear from John Skach, the Director of Planning, Design, and Community Development at Atlanta Housing. As an urban planner and architect, John is involved in Atlanta housings redevelopment planning efforts for a broad range of agency assets, including vacant land and existing buildings with a focus on creating sustainable, high-quality communities centered on affordable housing. Welcome, John.

John Skach:

Thanks, Maureen. Good morning, everybody. I'm certainly delighted to be on the panel today and honored to be representing Atlanta Housing and all the colleagues and folks that were involved in the project I'm going to talk to you about today. So let's go to the next slide.

And I'm going to share a case study that's not itself about or a multifamily building, but it really has principles I think, which can be applied to multifamily housing, and it's certainly helping our real estate planning and development team at Atlanta Housing raised the bar on our future affordable housing development project. Next slide.

The Roosevelt Hall is the last remaining building from University Homes, which was the first federally funded public housing project in unit in the United States for African-American families. The project's original two-story brick residential buildings are really cutting edge for the time and the optimized space and provided a lot of light and air.

And Roosevelt Hall served as the retail and the office building for University Homes and really became the social hub of the community. And while the residential buildings were really celebrated for their progressive design and their management, eventually they deteriorated like a lot of public housing, and were demolished in 2008. But Roosevelt Hall was preserved.

And in 2010, Atlanta Housing was awarded one of 17 Choice Neighborhood Pilot Planning Grants to reimagine the University Home site and its surrounding. Few years of intense planning followed and in 2015 HUD awarded AH a \$30 million Choice Neighborhood Implementation Grant to support physical transformation of University Homes into what is now known as Scholars Landing. Next slide, please.

As the symbolic and functional corps of Scholars Landing, Roosevelt Hall had a significant level of planning and design done as part of both HUD grants, both internally with our Choice Neighborhood team at AH and externally with the community. Four teams eventually emerged that drove the redevelopment program that the building prioritized placemaking to anchor its position in Scholars Landing.

That it includes space where the community could learn and grow, that it emphasizes environmental and social health and wellness and that it elevates green building practices as both a

demonstration project and as a contributor to an overall LEED-ND rating for the community. The final design by architects Moody Nolan returned the building back to a variation on its original layout with community facing uses on the ground floor and two office suites on the second floor.

To save floor area, the elevator and an exit there were moved out of the building into an external core, which allowed for a relatively easy conversion of a portion of the roof to an outdoor event space. Next slide please. So the architects brought on a talented team of sub consultants including the Epsten Group who lead the lead analysis for the building and programming and were instrumental in our decision to work toward LEED Gold.

After preliminary scoring resulted in enough points for us to achieve LEED Silver and potentially LEED Gold, we reviewed the criteria again to see if there were opportunities to elevate energy and water efficiency as part of a broader agency's sustainability initiative.

And with LEED Gold just within our reach, and with water conservation, an important agency and regional goal, the consultants convinced us to go for innovation points through the whole project water use reduction pilot credit. This performance pathway for water conservation offers credit for water use reduction across an entire project including indoor, outdoor and process water use.

At Roosevelt Hall this included indoor flush and flow fixtures, outdoor irrigation, and process water like janitors, sinks, ice machines and dishwashers. Next slide please.

Full project water use reduction involves a multi-tiered approach that has two main strategies, reducing total water use and reducing potable water use. Reducing total water use means limiting the building's consumption of all water resources regardless of origins. And this involves both design and equipment specification both inside and outside the building to make the most out of the limited water resource.

And at Roosevelt Hall, the total water uses reduction components include specification of low flow faucets and fixtures, specification of low flush toilets and urinals, selection of water efficient ice machines and dishwashers, selection of native drought tolerant ground cover and shrubs for landscaping and temporary irrigation

zones designed to support initial establishment of drought resistant plants and turf grass. Next slide please.

Once the basic water reduction measures are in place, the potable water use reduction strategy is a further refinement. At Roosevelt Hall, this is being achieved by the installation of a 15,000-gallon fiberglass cistern to harvest and store rainwater. Rainwater is captured over the entire roof surface of approximately 9560 square feet and will be used for irrigation of the active roof planters in the active lawn and for flush fixtures within the project.

Since the monthly available quantity of rainwater exceeds the 15,000-gallon capacity of the tank, it should be sufficient to meet the flush fixture demand and the irrigation demand. Calculations were performed based on the average monthly rainfall for the city of Atlanta which ranges between 3.1 and five inches or roughly 18,500 to 30,000 gallons per month falling on the roof surface. Next slide please.

One final component of the rainwater harvesting system is the metering and monthly reporting to the US GBC. The full system is shown in this isometric with the captured rainwater entering the basement from the cistern and running to a pump and filter. From there the water is directed to a three-way valve that allows potable water to enter the system if it's needed. And then through a volume meter before being distributed to the flush fixtures and the irrigation heads.

A makeup water meter, a whole system meter and individual meters to track irrigation will allow precise monitoring of the utilization of reused water and the amount of municipal water being used for faucets and other potable needs versus recharging the system. As I said as part of this credit, we've committed to a minimum of five years of monthly reporting using the US GBC's online tool. Next slide please.

So — calculated the impact of the strategies on baseline performance using a variety of readily available methods, efficient fixtures and reuse rainwater offsets the fixture demand by 80% and the irrigation demand by 92%. Moreover, the rainwater harvesting system provides an additional 16.4% water savings over simply incorporating efficient fixtures and native plants.

Through the implementation of this whole building approach, Roosevelt Hall is projected to achieve a comprehensive water use reduction of 83.23% over what it would require without the

efficiency measures, which is a remarkable achievement for us. Our utilities manager calculated that the financial impact of this approach translates into a savings of \$26,736 per year, which means that the system should pay for itself in roughly six to seven years. Next slide, please.

Next slide. Okay, so the whole project water use reduction approach is applicable to a wide variety of projects, regardless of function, occupancy, or location. We're currently in the first year of our Second Choice Neighborhood Planning Grant, which is centered on our 78-acre Bowen Homes site on the northwest side of Atlanta.

A working group dedicated to green infrastructure has suggested that we explore including a cistern like Roosevelt Hall, that could be utilized by multiple multifamily housing projects on adjacent blocks. And so we're looking to models that university campuses like Georgia Tech, for inspiration and guidance. Next slide.

Roosevelt Hall is still a work in progress for us. But we're already learning lessons from the effort that we hope to apply to future projects. First, we've realized that even small improvements to performance could have big benefits. Even without the rainwater harvesting system, the reduction in water use through efficient fixtures and equipment still has a major impact on what we would normally spend on water.

Second, we need to rely on partners to make change, we're seeing this on the Bowen Choice Neighborhood where the city's Watershed Management Department is involved in this early work and will play a key role in all phases of implementation. And finally, advanced planning is critical. Even if you don't have the resources in house, take the initiative to find technical help, and develop a framework for conservation even if a project is years away. Back to you, Maureen.

Maureen Erbeznik: Thank you, John. Awesome project. And thank you to all four of our panelists for those great presentations. We're now going to open up the floor to you for questions and a group discussion with our panelists so the panelists can come back on camera and unmute. And for the audience, please go to Slido and continue to enter your questions there.

So I think one clear question as the group comes back, is really I think there's a lot of questions around and let's start with Kevin, but

how do you deploy the technology at a smaller property? And is there a minimum size that you see?

Kevin Mulcahy: Yeah, so I wouldn't say there's a minimum size. But the main thing that goes into it is turf area, right? Or just general irrigation area. The more irrigation area you have, the shorter the ROI is going to be and typically, the bigger incentives or rebates you can get back from water companies.

Maureen Erbeznik: And, Matt, what about you? When you're looking at your customer base, is there a minimum size? Is there a different technology you deploy for smaller properties?

Matthew Bower: I think for the smaller properties where there's a focus more on indoor consumption and less about the irrigation component, our solution would be to monitor the indoor use and bring easy recommendations on how to curtail consumption. So, we let the data drive those kinds of decisions to partner and that baseline that I was telling you about.

So it's not so much is it too small? It's about what's the customized solution that the customer is looking for?

Maureen Erbeznik: For either of you, is there an area that you focus on? Is it because there's rebates available? Is it whether what - ?

Matthew Bower: Yeah, I can go to that. I think a lot of our customers in the areas that are experiencing significant rate increases are seeing this a real value in curtailing consumptions. So certainly, in the state of California, where you have punitive tiered structures, we're able to alert against those and I'll inform our customers that, listen, we're only halfway through the month.

But you've consumed 66% of your allotment for those lower tiers, let's work together about some creative solutions that we don't compromise the turf, but we don't also enter into that area where you're going to be paying 5x what you did per kgallon.

Maureen Erbeznik: Great. Kevin, is there any place that you target or same?

Kevin Mulcahy: Yeah, very similar, right? The higher the water rates is going to be easier to achieve your ROI so that we're looking at very similar projects.

Maureen Erbeznik: And, Nick, can you come on camera? Hi, Nick, what about you? What is the minimum size for your technology, the number of units or - ?

Nicholas Benz: To pair up my panelist's colleagues, it really is a function of water cost. So there's always, for folks with nearly passed through free water, it's really hard for them to want to engage with water conservation technology. That being said, we're happy to help them.

We typically see a very powerful payback, and return on investment take place at the 100-toilet mark, once properties hit that, that's when we start to see a very sort of repeatable 15 to 25% volumetric reduction on water use. It can happen with smaller properties, but law of large numbers, you might just get a batch of really good toilets that just don't leak all that much.

Maureen Erbeznik: Great. John, what about the rain water harvesting? What do you see is like a minimum property size where you would think that the ROI sketches out?

John Skach: I don't think it really depends, I mean, you can have a small system that's specifically utilized for irrigation and could capture water from the site, doesn't have to capture it off of a building. And that could be a retrofit, and that would reduce your water consumption quite a bit.

So I think it depends on the project, it depends on where you are with the project. If you're planning a project from scratch, then it makes sense to really try to program these things into the building, work with your development partners to try to get it in there and really elevate it up. So it's hard to say, but I think it depends on what the situation is.

Maureen Erbeznik: Yeah. I think for all of these, it's going to be very site dependent, but maybe something that's not site dependent. And I'll start with Kevin again. What are your steps in the process of how did you go about finding partners, vendors? Did you do RFPs? Is there a sequence of events that you typically go through?

Kevin Mulcahy: For sure. So as we spoke earlier about is that we had a water taskforce to really hone in on what areas do we need to focus on for water saving, so we started kind of big picture and then worked our way down. We targeted that irrigation was something we wanted to look at. So we started looking at irrigation saving companies.

We have other projects that we're looking at, too, that are similar how we got to leak management, and working with a company like Nick's is going to be one of our next big targets. So it's really just trying to find what is your issue, and then branching out to the companies that will be working on those types of projects?

Maureen Erbeznik: Do you do RFPs typically?

Kevin Mulcahy: Yes, absolutely.

Maureen Erbeznik: And, Matt, what about you? How do you lead your customer through a process?

Matthew Bower: So I think it all starts with the data. And I was on Slido looking at some questions about the baseline and things. And what I would offer up is that if you were to just take a 12-month snapshot as a baseline, I think you're going to be taking in some anomalies that you want to normalize over time.

So we look at two to three year of historical costs and consumption to come up with a very, let's say, regular pattern of water use over time. And that takes in the weather into consideration. If you have a drought-stricken time period in your base year, that's not a very apple to apples comparison. So we want to get as much analytics as we can to run that through to see what the true opportunity is.

And then it's about walking through the actual implementation of an installation of those meters and controllers that I was mentioning on the ground. If you were to ask me, do we have partners? We absolutely have partners. It's an outreach across the country that we need, but they have to be really vetted well.

Because these are proprietary controllers, they have to have a strong working knowledge of it. And so we actually go through a vetting process to oversee the installation to make sure that things are getting done correctly.

Maureen Erbeznik: And this would be both for you and Kevin as well, are you repairing irrigation systems before you're putting in this new technology?

Matthew Bower: Some of our customers have asked us to do a comprehensive zone by zone audit. We have some phone apps that were streamlining the process with to bring a lot of transparency to what's happening

at the property. So we can conduct that audit, facilitate and choreograph the repairs.

And then begin to implement evapotranspiration schedules, or we can implement the schedules because of the phone technology that we use with our central command, we're able to go through those zones with a high level of efficiency. Either way, we know that the integrity of the system is paramount, and we want to be a part of that solution for our customers.

Maureen Erbeznik: Yeah, Kevin [crosstalk]

Kevin Mulcahy: Just go off on that was saying we're doing very similar work every time we do one of these projects, where we're going in completing an entire audit, just to make sure we're recognizing where we have issues and to remediate those before we put in these high-cost systems.

Maureen Erbeznik: How do you deal with the variety of landscape contractors you may have in your portfolio? Do you have one set contract where you're they're obligated to make these fixes or manage water in a certain way?

Matthew Bower: Yeah, it's a great question. I would say that there's a lot of different relationships between property owners and landscapers, right? Some have maintenance agreements, where they're on a monthly fee, and we have to build relationships and rapport with those individuals. So training is important to Banyan and we have the individuals who are on site, in locations like the NFL cities that are quickly deploy when there's an issue.

But more importantly, to build that trust, and to understand why the algorithms are in place to apply the appropriate amount of water to turf and landscaping. And I think once these savings start to facilitate without compromising the turf, then it's about, oh, I didn't know you were in that other property, for example, let's rinse and repeat that process.

So yes, we work with some of the largest landscapers across the country, but also some of the smaller ones that have yet to be brand recognized throughout the US.

Maureen Erbeznik: And, Nick, I got a question for you. How does your business model change if the tenant is paying for the water?

Nicholas Benz:

That's a great question. That onus is going to fall on certainly the whoever's paying for the system or implementing it rather than the visionary. Who's the visionary for the project, right? Is it the property owner, the property manager? If they recognize that their tenants pay for their water, and they still want to implement the solution, that's fantastic, happy to help them make that happen.

It's a little bit trickier to sort of recognize property wide savings at that point, but we can't do it. It just takes a lot of bill aggregation. In the case of a rub, if you have ratio utility billing at a property where there's a main bill that comes in for the property and is divvied up across your unit population, it's very easy to recognize water savings there.

And it can certainly be passed through to the customer since, if they take, a \$1,000 water bill and we bring it down to 900 or 850 a month, that savings will get parceled out and represented on each rub bill to each tenant. So I guess short answer is it can be tricky, depending on exactly what the format for customer billing is, but we've done it before and we can do it.

Maureen Erbeznik:

Great. Well, that brings us almost to time. Got a few wrap-up slides we've got to do here but thank you so much for your presentation today was awesome and I'd like if the presenters can go on and actually there was some a lot more questions that are in there that each of you can personally answer that would be fabulous. But thanks again. And that concludes our group discussion. Before we go I'll just do a couple wrap up slides.

So the Better Buildings Challenge is excited to announce the launch of the Water Savings Network. This network will be open to all facility owners and managers that are interested in pure exchange and technical assistance on topics related to water efficiency and the nexus between water savings and energy reduction.

You can learn more about the participating in the Water Savings Network during the introductions to Better Buildings Better Plants Water Savings Network kickoff call this Thursday September 30th from two to three and you can contact your Better Buildings Challenge account manager to register. Next slide.

This webinar is part of the 2021-22 Better Buildings Webinar Series and as you can see, there's a group great lineup of presentations through April, you can visit the Better Building Solution Center to learn more and register for each of these

webinars. Next slide. And we're hoping that you'll join us for the next webinar on October 5 EVs at Apartments: Navigating Technology Trends And Implementation.

You can join this webinar to explore the demand for electric vehicles at multifamily properties and understand how the EVs are part of a comprehensive energy strategy. And if you're interested in learning more about the topics discussed today, I encourage you to download our additional resources handout from the Zoom chat box. It contains the resources from Better Buildings and our speakers. So we hope you enjoy.

And with that, I'd like to thank our panelists again, Kevin, Matt, Nick and John for taking the time to be with us today. If you want to learn more about the topics discussed today, please check out our Better Buildings Solution Center or feel free to contact our presenters directly with additional questions.

And I encourage you to follow the Better Buildings Initiative on LinkedIn and Twitter for all the latest news. And lastly, you'll receive an email notice when today's slides, recordings and transcripts are available on the Better Building Solution Center. And thanks to everyone.

Matthew Bower: Thank you, Maureen.

Kevin Mulcahy: Thanks, everyone.

[End of Audio]