

Level Up Audio Project, Season 2

Episode 1: Mitigating Extreme Heat in Tempe, Arizona

Voice Over: Welcome to Level Up, a FEMA audio project for practitioners where communities share their stories and expertise about building resilience and reducing risk from a disaster. America's cities are warming at an extraordinary rate. Landscapes and built environments dominated by impermeable surfaces like pavement and concrete create neighborhoods known as heat islands that are significantly hotter than surrounding areas. While heat islands are already prevalent in many urban areas, climate change will make these areas even hotter. Rising heat and dangerous public health and increases energy use and pollution levels in cities. These impacts disproportionately affect children, older adults and communities battling systemic racial and economic inequality. Like so many other cities, Tempe, Arizona is feeling the heat. In this episode our interviewer, Emily Breen, a community planner with FEMA Region 9 will speak with Bonnie Richardson, an urban planner and architect with the city of Tempe who has made strides to increase green infrastructure to combat extreme heat.

Voice Over: Through its Alameda Drive Bicycle/Pedestrian Streetscape Project, the city plans to increase tree canopy and install a bike lane along the street. To make this vision a reality, Bonnie and her colleagues considered several plans and went above and beyond to engage residents and businesses. And though it might take a little longer, their approach is paying off.

Emily Breen: Arizona has always been a warm place, but I'm wondering when did you start seeing a change in the extremely hot days?

Bonnie Richardson: Arizona has been in a long-term drought for 21 years now. So as we've started to have a lot less snowfall and rain, it's really increased the heat and exacerbating that is our population growth. We've increased the built environment and sprawled out over the desert with a lot of roads and parking lots. So this hardscape absorbs and reradiates the solar heat and just continues to add to the problem. So as we're taking away landscape and trees, we're adding hardscape that contributes to heating up the environment. We used to have diurnal temperatures where it would get quite a bit cooler in the evening it would cool off, and then it would heat up again the next day. But now our nighttime temperatures are over 90 degrees in the summer and sometimes have approached 100. If we over 100-degree temperatures consistently at night, we're far beyond being able to make substantial improvements to our temperature.

Emily Breen: So what are some of the ways that Tempe is tackling some of these challenges?

Bonnie Richardson: We were fortunate to have our council make a position for a sustainability manager, Braden Kay, and he has been instrumental in helping to coordinate all of the city's efforts. And in fact has just completed our initial Climate Adaptation Plan. So sustainability and climate really touches all departments in a city and in a community. We also completed our Urban Forestry Master Plan and Action Plan. And the Action Plan there is, is what's important. The citizens were really involved in developing that plan. So one of the outcomes we wanted to see was an urban forester. And a year ago, August, we hired our first urban forester. So he's responsible for not just planting more trees, but also looking at the health and stability of our program and really collecting data.

Voice Over: Green infrastructure, which refers to vegetated or permeable surface alternatives to traditional gray infrastructure, can play an important role in mitigating the impacts of extreme heat in urban areas by replacing hardscape with surfaces that absorb less heat, promote evaporative cooling and provide shade. These measures use plant or soil systems like rain gardens, green roofs and urban trees and forests to capture and slowly release stormwater flows, thereby also mitigating flooding and water pollution. Green infrastructure can provide other important benefits to communities as well. It improves air quality, promotes economic development and fosters healthier and more socially cohesive communities by providing recreational space and increasing residents' access to nature.

Emily Breen: So I wondered if you could describe the Alameda Drive Project for us.

Bonnie Richardson: So in 2003, this project was included in our Tempe Transportation Plan. This is a three-mile stretch of road. It is highly residential for half of that area and then the other half goes through some industrial and now what's developing is multi-family housing. The ultimate goal is to connect Tempe with the Phoenix bike paths on the west side and the city of Mesa and other eastern cities on the other border. This will make it so it's very easy and comfortable for people to bike for miles and get through a number of our suburb cities and to downtown Phoenix. The project is combating extreme heat by reducing some of the pavement area and in its place, planting large canopy trees that will provide shade and cooling and it will reduce the temperature of the surfaces. So that would be black top of the street and the concrete sidewalk. It will also be providing shade for the users. So it will encourage the activity of bicycling. It will encourage people to walk in their neighborhoods. And so by planting trees, that is also positively affecting the health of our community.

Emily Breen: Do you see, I see any other opportunities to integrate either the Climate Action Plan or the Urban Forestry Master Plan with other plans such as the county Hazard Mitigation Plan?

Bonnie Richardson: Yes, we are working closely with the county and we also have an organization made up of a variety of municipalities in the county, as well as Native American tribal communities. And it's called the Sustainable Cities Network. We work together at solving problems that are not just affecting our individual

municipality, but that are similar to conditions in other cities, try to help those cities who haven't yet accomplished some of these goals, but also look at regional goals.

Voice Over: For Bonnie and her team, community engagement has been at the core of the Alameda Drive Project. Their approach is not just to inform the public but to enlist them as co-creators, involving them every step of the way.

Bonnie Richardson: So in 2015, there was initial public involvement in meetings, and that was to develop a concept plan. So in 2018 and 2019 was when I started working on the project. And of course, over the years you also get new people in these neighborhoods and you want to be sure to bring them along as well. We had three rounds of public outreach, and every time we go out to the public, we really want to be sure we make it easy for them to participate. So we will have a night or afternoon meeting. And then we'll also have a Saturday meeting. So if people are working or their hours don't work with their family and kids going to school, they can come on a Saturday and still learn about the project and let us know how they feel. And as we're developing the plans, we are asking not just for comments in meetings, but also we take comments online. So the web presence and opening that conversation to others who feel more comfortable responding online really expands our reach.

Voice Over: As with any new project, not everyone was immediately on board. Bonnie and her colleagues took their time to meet residents where they were at—literally—to listen to their concerns and discuss the trade-offs involved.

Bonnie Richardson: In order to plant trees, the only right-of-way we could use was within the curb-to-curb area. That meant we would need to take out a parking space in order to plant a tree. So that created the need to work individually with every resident facing on Alameda and make sure they were willing to give up what they perceived as their guest parking. In most cities, you can do whatever you want on your right-of-way. But for us, we wanted to be very sure we weren't taking away something from the residents without them feeling they got something in return that was more valuable. We had to identify where residents felt it was an advantage to place the tree. Then we went through a whole series of conversations about what tree would that be? Who's going to prune it? How's that going to work? So that's what takes place in this long conversation with our residents is working out all these little questions.

Emily Breen: Wow. That's a really impressively tailored approach in terms of working with individual homeowners to make sure that the location of the tree was going to be acceptable.

Bonnie Richardson: I think having them understand that we really cared about how they felt and what their ideas and concerns with the project goes a long way. But we had one meeting in someone's living room with, I think, 30 people. It was really standing room only. And when you're in that kind of setting, instead of meeting at the

local church or in a school room, it's very personal to people. So we heard all sorts of comments.

Voice Over: To gain public buy-in Bonnie explained to residents the many benefits of increasing the tree canopy in their neighborhood.

Bonnie Richardson: Then there is research out there that when you have tree canopy shading a street, it helps to slow traffic just having the dappled shade on the surface. So we were appealing to this sense of preserving the quiet and safety of their neighborhood by slowing traffic. In the Urban Forestry Master Plan, we identified a number of benefits of planting trees. And if you plant a tree in your front yard, it improves your property value and that curb appeal. But if your whole neighborhood takes that on, it raises values for everyone. We also showed in our Urban Forestry Plan that you can substantially lower the temperature of a neighborhood by planting more canopy trees, and by reducing the amount of hard pavement you've got and by shading driveways and sidewalks and streets. So when you start doing those three things, you're going to start to feel a little cooler temperature, particularly in the evening and at night. So we've tried to talk about that. And again, it's a long-term vision, but it's also very important for people to understand their custodians of the future residents and children growing up in the city.

Emily Breen: So it sounds like to make these projects successful and to move them forward, you have to pair that long vision with the shorter term benefits.

Bonnie Richardson: That's absolutely correct. And we find this even when we're working with businesses about the idea of planting trees in their parking lot or along their street front. It's been proven that if you plant trees in a retail setting, that more people will come shop there and more people will stay longer while they're shopping if they believe that this is an interesting vegetated, tree-shaded place to be. If we just start adding up all the benefits, it really helps make the case for doing this.

Emily Breen: Do you have any plans, will you be measuring or monitoring the difference in heat on Alameda Drive in the future?

Bonnie Richardson: I would like to hope so. What we're doing currently, Braden and I both have several heat studies underway. We're working quite closely with the sustainability scientists over at Arizona State University. So the more we can measure the benefits, the easier it is to influence people to plant trees and to help cool the environment.

Emily Breen: So I understand you've secured the funding for the Alameda Road Project. It sounds like you expect to sink shovels into the ground in 2021.

Bonnie Richardson: Yes. Yes. And during the construction, of course, we will also be in contact with citizens. They'll be made aware of when we're going to be out there and what

we're going to be doing. And my hope is how we have a great street party when it's all completed. So we can all walk out there and talk about how great it's going to be to be able to walk the neighborhood and bike through the city.

Emily Breen: That sounds amazing. So is there anything in particular about the Alameda Road Project that has been most exciting or most inspiring for you personally?

Bonnie Richardson: I'm always inspired when I see citizens who are really willing to go the extra mile, to reach out, to bring in diverse views to the conversation. For me, that's exciting. And I feel like I'm helping to make a difference in improving our city for future generations in a sustainable way. I'm a firm believer in grassroots efforts. So whenever I get a chance to go out and talk with people, I like to remind them that they have more power than they think. And that calling their council member or attending meetings at the city, or talking with department heads about something that's concerning them, they really can make a difference because our council leadership listens to the citizens.

Emily Breen: Well, Bonnie, I just want to thank you. I've learned so much today about how to mitigate heat through green infrastructure, how to inclusively and holistically bring the different components of your community into the design and implementation of this project. So I just want to thank you for your time. Wish you all the best and look forward to that block party in 2021.

Bonnie Richardson: I'll be sure you're invited. Thanks for having me.

Voice Over: This episode of Level Up was produced by FEMA Region 9's Mitigation Division and *Resilience Action Partners*. It was made available to you through a partnership with the Georgetown Climate Center. The Georgetown Climate Center works with state and local governments to develop "heat-smart" communities that are well-prepared to cope with rising temperatures. As part of this work, GCC has developed toolkits in collaboration with leading cities to help them identify and deploy green infrastructure approaches in their communities and to do so in a manner that promotes equitable investment and prioritizes the most at-risk residents. These include toolkits on Adapting to Urban Heat, Scaling Up Green Infrastructure in the Built Environment, and, most recently, Equitable Adaptation Legal and Policy solutions. These resources bring to life different legal and policy approaches to support equitable resilience by highlighting case studies, featuring both procedural and substantive efforts and over 100 communities across the United States. All of these resources are available at georgetownclimate.org. To learn more about the topics and programs mentioned in this episode, check out the show notes.