

Linking Urban Heat Islands to Climate Adaptation Planning

Brendan Reed: So thank you. And hopefully everyone can see the slides, so I guess no news or good news or anything. My name is Brendan Reed. I'm with the City of Chula Vista, actually the environmental resource manager. And one of my main responsibilities is coordinating the city's climate action program.

Neelam Patel: Brendan?

Brendan Reed: Yes.

Neelam Patel: We actually don't see your slides.

Brendan Reed: Oh. Let's see. So I don't see the upfront.

Lauren Pederson: I will send it to you.

Brendan Reed: OK, thank you.

Lauren Pederson: That's right. There you go.

Neelam Patel: And audience, as we're working through this, if you can, you know, take the time to think about questions you might have that would be great.

All right. Brendan, you're good to go.

Slide 1: Title Slide

Brendan Reed: OK. So one of my main responsibilities is coordinating the city's climate action program. But I do want to acknowledge it's really, there's a whole team in the city and I know a number of them are listening in. And I think that's one of the keys to our city's success is that really every city department plays really a big part in implementing and designing our climate action program. So as mentioned, my presentation is really about in our circumstance how we've linked heat island reduction activities to our climate adaptation planning.

Slide 2: Chula Vista Statistics

So just a little bit about the City of Chula Vista to put in context, we are in Southern San Diego County, California so we're kind of bottom left on the left. And we're 7 miles north of the U.S.-Mexico border and we're the second largest city in our county with about 250,000 residents. And we have a very diverse population socio-economically, ethnically, as well as the landscape. You'll see on the bottom left the picture of our city. And I mainly just show that it's a great kind of microcosm for climate action programs, because you know we have a base front, we have sort

of a ring of open space, we have lots of urban wild land interface and we're a growing city so we do have some green field developments.

And then the other thing I just have on here is the spirit of Olympics. Chula Vista is also the proud home of the U.S. Olympic team's only year-round one where are there multi-sport facilities. So that's one of our claims.

Slide 3: Climate Adaptation Planning

Our climate action program goes back a long way, actually on the mitigation side to the 1990s. We are one of the first cities to work with ICLEI and of course as sort of eluded in the previous presenters talking points to that. We are mainly focused on greenhouse gas emissions reduction and we do sort of all the typical things cities do for that.

But a couple of years ago, the whole idea of climate adaptation planning sort of was brought to our attention, and of course this is an effort to reduce future risks and costs from climate change impacts. You know there's enough greenhouse gas up in the atmosphere that you know impacts are already happening and those will be amplified in the future. And so locally, we can expect things like increased average temperature of about 5 degrees especially in the summer, sea level rise over a foot, increased water and electricity demand, and more frequent and intense wildfires.

So the way the City of Chula Vista approaches our climate action program, of which climate adaptation is a part, is it's really a stakeholder driven process. About two years ago, I guess it is, we formed a stakeholder group or we called the climate change working group, they had 15 representatives from utilities, NGOs, the business community, just residents, educational facilities and they were really charged with identifying vulnerabilities to our city from climate change and identifying strategies to address those vulnerabilities.

And on the screen here, you'll see there were seven focused areas that group was working in. And one of the things to highlight is, when I was preparing for this presentation, you know, urban heat island issues are really part of most of these. For example, in energy management, of course with urban heat island impacts that increases local energy demand for cooling load. As far as public health, as was already mentioned, increased temperatures lead to, you know, ground level ozone and smog.

In the business and economy sector, we found that, you know, increased temperatures impact workers' health and businesses' utility cost. Water demand of course increases. Most of our water is used for outdoor and landscaping, if it's warmer people water more, and then a very serious threat in Southern California is higher temperature and how that drives wildfire prone conditions.

So there is this really strong nexus we found between urban heat island mitigation, if you will, and climate adaptation planning. I did also want to point out that the San Diego Foundation, a local foundation, provided a lot of support to us in this exercise. They actually created a study that summarized and synthesized what the local impacts would be in 2050 for our region. And then of course ICLEI provides a lot of support to local government in climate action planning.

Slide 4: Climate Adaptation Planning Process

So after a year long stakeholder process, the working group came up with 11 strategies. And those strategies were actually unanimously approved by our city council. And we've been implementing those strategies for about a year. And three of these – three strategies actually have to do with urban heat island impact. So that's what I just wanted to go a little bit further in and summarize some of the early implementation that we've had in those areas.

Slide 5: Initial Implementation – Cool Paving Specifications

The first part is cool paving. Our stakeholder group recommended that streets and parking lot, both public and private, use cool paving materials. So how and of course I mean, you know, materials that have increased albedo or solar reflectance index.

And so we've sort of broken down this into three steps. And the first being connecting – oh, sort of a white paper study on the different technologies and their applications that would be applicable to the City of Chula Vista and conducting a cost benefit analysis.

So we've actually have a draft study that we've a consultant put together for us and it's looking at, you know, for new versus existing streets, you know, order some of the potential cool paving technologies versus maybe application for parking lots. It's also looking at efficient as sort of cost-benefit arena, some tradeoff and synergy so there could be materials, like pervious pavement that has pretty good urban heat island mitigation effects, but it also has a co-benefit of storm water management.

So we hope to, I think, finalize that study in the next two months. And that will help really help guide the next two steps, which is using or demonstrating some of those products out in the field to collect more information, and then eventually to create new city specs that would be, you know, put into the city's capital improvement projects, and potentially the development specifications for private development.

And we have worked a lot with sort of internal stakeholders. Our engineering department leads a pavement management coronation team, so there are lot of internal stakeholders in the different departments involved with that, as well as, you know, we're reaching out to our public commission, like our Development Oversight Committee and our Resource Conservation Commission.

Slide 6: Initial Implementation – Cool Roof Ordinance

The second project or program that we're looking at is cool roofs. And the working group recommendation – the stakeholder group recommendation was to make all new residential homes have cool roofs. We say residential homes because that's really the majority of our development in our city at least in the future. And they recommended that we revised our local green building standard to do this.

So one of the things that we learned is that in the City of California, you actually have to go to the California Energy Commission to seek approval to do this, because in essence you're messing with the energy code. So as part of that effort, you know, the city did completed a cost-effectiveness study where we look at requiring this and looking at the energy cost saving, and how long it would take with those savings to repay the incremental cost of having a cool roof.

And we found that for single-family homes for example, really it cost probably \$75 extra to have a cool roof versus the traditional roof. And that's probably an overestimate, and in a lot of cases we found that there was no additional cost at all. And that payback period was as short as three years. That's pretty good for a tile roof that probably lasts 30 years.

So as the result of that effort, the city did adopt a new standard that requires all new low-rise residential units that single family and multifamily to incorporate cool roofs with the SRI over or equal to 78. And that is linked to a California green building standard that's voluntary in most of the state; basically we were making that component mandatory.

Again, we work with a lot of stakeholders in this. I already mentioned the California Energy Commission and then there were two commissions at the city related to building permits and development that we also receive feedback on.

Slide 7: Initial Implementation – Shade Tree Policy

And then the last part is just a shade tree policy that the climate change working group recommended, that really the city better emphasizes canopy-forming trees in its public and private projects. So this was a new policy that the city council adopted. And in parking lot that requires 50 percent shade cover of all parking stalls within 15 years. It also allowed alternative forms, sort of alternative cover options, meaning one can do cool paving instead of shade tree cover, or one could put in a solar carport.

There's also a part in the shade tree policy that tries to emphasize the preservation of existing trees by giving sort of higher credit toward keeping them. So that's the policy that actually is now in place.

Slide 8: Lessons Learned

So I just have my last slide here. I just wanted to kind of overview some lessons learned. One thing may – a big thing was that in our case, we found again a really strong link with heat island reduction activities in our climate adaptation planning. It was a very natural fit. And because in our city our climate action program is really the umbrella for a lot of our sustainability initiatives, it was really great to see that now where we're addressing urban heat island impacts through that.

Of course, a stakeholder-driven process makes it a lot easier for staff when it comes to bringing in front of our policy makers and our elected officials, and it actually was the stakeholder group that literally presents their recommendations and the strategy, so that was a great – a great thing to see it being a bottom-up approach.

Definitely we found benefit in stressing all the great things that happen when you address urban heat island impacts. Again, cool paving could also address storm water management and those things.

Definitely a thing that we're finding is the need for some more long-term monitoring of sort of these policies and these programs. For instance, you know, we're looking at cool pavement, and it's really hard to find sort of a long-term minor result of, you know, cool paving out in the field. This is a major asset for our city and, you know, we need to make sure that we're completely aware of and understand sort of long-term impacts to maintenance in those things. So that's something that we're finding a need for.

And finally, we really want to institutionalize these policies and programs into sort of the city's business culture. Or we say that, I never want to see, you know, climate adaptation planning as a separate budget line item in a CIP project, because I'm sure that's one of the first things to get value engineered. But you know we want to have this integrated into our specs, into the way we do business in the city.

And then I just have a final slide that hopefully will pop up here, and it's just the funding acknowledgement. We have a great partnership with our local utility and the Public Utilities Commission at the state. And they provided a lot of the funding for the three program areas that I showed mainly because of their link with potential energy savings.

So thank you again for having the City of Chula Vista participate.

Poll Question #3

Neelam Patel: That was a wonderful presentation. And thank you for closing with your partnerships and the funding connection. I think that is something that addresses some of the concerns that we heard in the poll questions earlier. And if you do have additional questions for Brendan or Brian Stone, please do submit those.

What we'd like to hear about, I mean, one thing that Brendan closed with was, you know, heat island mitigation and even larger sustainability initiatives should be integrated into the culture and the business of the city. And while that certainly is the end goal through Brendan's presentation, we did hear about the connection between adaptation, adapting to the changing climate and to the heat island mitigation.

So we know a lot of communities in the past have experience with climate mitigation work. We'd like to get a sense now of how many communities out there are thinking about adaptation, thinking about how to prepare for the changing environment, which includes some of the extreme heat waves that we're seeing more of as Brian pointed out. We're seeing more of this over the last few decades.

So when it comes to climate adaptation, are you talking about it, starting to think about it, are developing plan, assessing impacts a focus on your strategies? If we could, please see the results?

So it looks like most people are in the early stages and they are trying to talk about it, and then also thinking about which adaptation strategies may work best. So if you are – if you are addressing heat impacts, certainly today's presentations, especially the model that Chula Vista provided could be helpful to move the work in your communities forward.

Thank you for taking the time to answer the poll question.

And with that, I'd like to introduce Matt Grubisich from the Texas Trees Foundation to talk more about how they partnered with the City of Dallas to get more trees on the ground.