

Louisville Urban Heat Island Reduction

Slide 1: Title Slide

Victoria Ludwig: All right. Let's get into our first presentation. Maria Koetter is going to speak about the city of Louisville's work in the – with the heat island effect.

Maria is the city of Louisville's first director of sustainability and she wrote the city's first comprehensive sustainability plan called, "Sustain Louisville" which was put out in 2013. Maria's previous experience in the environmental field includes working with both government and Fortune 500 private sector clients.

Maria is going to talk about Louisville's very comprehensive approach. I hope you can learn from that. Maria, thank you for joining us. Go ahead, please.

Maria Koetter: Hey, good afternoon, everybody and greetings from Louisville. It's really nice to get to speak for you today. First, just a couple of quick facts about our city. Louisville is actually structured with a merged city and county government with a strong mayor. We have a population of 750,000 and about 400 square miles. So that's you know, kind of keep in mind for the background of this conversation.

Slide 2: Office of Sustainability

Maria Koetter: OK. So I was actually appointed by the mayor and the Office of Sustainability was formed in 2012 and in that year, I wrote our city's first comprehensive sustainability plan which I'm sure if you're familiar with city sustainability planning, these six focus areas would look pretty familiar and within those six focus areas, we had 19 goals and then a number of starting initiatives that we had 63.

So the plan have about three over arching objectives, protecting the environment and reducing our carbon footprint. Louisville interestingly enough is a results of similar factors that in effect to urban heat island, we also have one of the worst carbon foot prints in the country and that is partly due as I said to being geographically located in a big River Valley.

So then, ensure the health, wellness and prosperity of our citizens and startedly great a culture of sustainability. So those are the three over arching objectives of our comprehensive sustainability plan.

So then just recently, we issued the one-year progress update which was everything that we competed in 2013, and some of the original 19 goals were strengthened and slightly revised, then we went down to 17. So the – now, we're looking at 17 main goals, and then the key change this year was that we included all the baseline metrics where we could. And I think, that's very important to measuring progress in going forward.

Slide 3-4: Urban Heat Island Study

Maria Koetter: OK. So Dr. Stone, Dr. Brian Stone is a professor at Georgia Tech University and in 2012, he published a study of the top 20 cities with the hottest heat island effects, and Louisville sadly enough was at the top of that list. But as a result of this work, we were recognized in a bunch of national publications and of course, locally this was a very big topic. And this chart was basically what was published and really, you don't have to have any science backgrounds to look at this and understand that this is alarming and it was a call to action.

So as I said, when this slide hit the press, we – you know the folks from the city became concerned and Dr. Stone actually made a trip to Louisville to present his findings. He spoke at a number of community forums and at that time, the mayor had recently formed a tree advisory commission because we also struggle with tree canopy issues. And so, all these things came together very nicely.

Slide 5: Surface Temperatures

Maria Koetter: So this is – so the study began in January of this year and this is one of the slides that Dr. Stone has provided that shows the first analysis of our data and this is the surface temperature analysis. So the red squares show that over 95 square miles have surfaced pressure of 93 degrees or more on the day of this picture, this image which was 2010.

Then, over five square miles exhibited surface temperatures in excess of 100 degrees. So that's the red cells. So the orange cells, we had 95 square miles and the red squares were 5 square miles so you can see, this is pretty significant.

And one of the exciting or interesting things that we know that I think that's been interesting as this slide, you know we just presented this last week and again, the studies just began in January is that five of our six most significant hotspots are outside of the downtown core.

So I think that when you talk to people around the community about you know, the urban heat island, it's what those it mean to me? And we can show this slide and say, it does affect you, it's not just the downtown. So I felt that that was some really good information to have.

Slide 6: Urban Heat Island Grant Project

Maria Koetter: So the grant as I mentioned, well, the project is fully funded through private grant. We applied for and received a grant from a funders network for smart growth and livable communities and that program requires a one-to-one match. So we have the good fortune of a couple private foundations that sets up and were willing to also support and match that, and then – so we have a total budget on this project of \$135,000.

So again, it began with a surface temperature analysis and we got that you know, image from satellite imagery and from there, we are building – Dr. Stone is using some of the resources locally which has visibility down to the two split interval and using that information to actually do a land cover assessment, and totally building out this model for the whole city which is as I

mentioned, 400 square miles. So it's a huge undertaking. And then from there, he's weighing on the information about the climate models, he can do the temperature projections based on that.

So one of the other important things that we're looking at through this study is what are the health impacts of heat? We know that you know, to be a city of – a viable city and in the year 2015, we – it's bad enough to feel like more hot but we know that heat related deaths are significant a significant issue and are going to continue to get worse as you know, we see more severe summers in the years ahead.

So we are using and layering on to this study population vulnerability assessment because we have a large portion of our population living in lower income housing that is of course, the least energy efficient, housing stocks typically. So we want to make sure that people living in these areas actually are – that are impacted by the heat effect are identified and that we can physically tailor our heat mitigation efforts to those parts of the county and taking in to account, the population, of vulnerability and the risks associated with that.

So the outcome of the study is a heat mitigation plan. So part of the modeling is where the information is loaded in, and then the scenarios are going to be populated, and then one scenario is going to be tree planting. So these – again, these are the solutions that we're going to be looking to combat our urban heat island issue.

So one will be tree planting, another would be – tree planting and green roof, another would be surface coating so cool coatings including pavement, street sidewalks, building roof. And then, reflectivity of those aspects as well and we're also looking at waste heat. So waste heat in Louisville, we have a lot of mobile source emissions. Vehicles are significant issues and of course, that contributes to poor air quality. And then, just the way heat is generated by buildings specifically in our downtown area.

OK. So the mitigation plan then, we'll have this tailored solutions that actually will tell us if you plant these many trees in this part of town or this much cool paving or this much green roof, then you will reduce your heat island X amount or at least mitigate. So slow down the acceleration of our issue.

Then, it's really great that we included as part of this grand project, a portion of the funding to do robust community engagement because as you know try to teach people about something new and different and you know that everybody wants to know why should I care, but our plan here with the community engagement piece is to specifically target the folks living in those communities that are most vulnerable to heat stress.

So you know, it's not any good, it doesn't do the public any good if we know the data, we have to be able to share that and get that out there in the community. So at this time, you know we already have things underway. As I mentioned, Dr. Stone actually came up – and he was in town a couple of weeks ago and presented the preliminary findings of his study which is the heat grid map that I should a couple of slides back and we had a wonderful response.

We have several community meetings and I had arranged different stakeholder group meetings, and the crowd was full. So people are really interested in this and I think that's great and of course in the future as I said, we will be continuing to plan for our engagement strategy when we get the results.

Slide 7: Urban Heat Island Management Plan

Maria Koetter: So this project is a 14 months project. So we actually – 14 to 16 months. So the actual report and management plan will be issued next May. It's kind of what we're targeting. So we have some time between now and then to actually come up with our point and strategy and how we're going to actually use this project to mitigate our heat island issues. All right. Moving along, now, as I said, we – you know we have the initial slide that showed Louisville's heating is hotter than other cities but what is our baseline for improvement?

So having that information is going to be vital as you know to impact policy decisions and how you know, that we can play a role in being a leader with our own facilities and building then what – how we spend the citizen's dollars but we also want to look at things such as code, you know strengthening our building codes to promote energy efficiency and the cool roof and green will both do that.

Also looking at potential landscape ordinances to protect trees, reduce our urban heat impacts and of course, then, we're conserving water as well through trees and grand structures solutions which also help combat heat island. And then, you know obviously, we want to manage sprawl and promote density because that'll do good things as well with respect to the project.

Instilling heat considerations on all developments, you know some things we're seeing around the country are cities that are requiring a heat impact analysis for new developments. So showing the change of temperature from bare ground, ground or green space to develop. So once we get the plan, we're looking forward to implementing and as I said, we're already cataloging some of these policy changes and beginning to incorporate strategies in the budget.

Most importantly, to start the conversations around you know, what are we going to do. So I think if we start now, by the time we have the full data and document in the spring, we'll be well positioned to actually take steps. So of course, the fiscal year is of July 1, so by next July 1, you know my hope is to have monies earmarked to actually do implementation and lead as I said from the city level, and then incentive programs and different things like that, that we're looking at.

Slide 8: Tree Canopy Assessment

Maria Koetter: Oops, skipped a slide. OK, so here – so I just also wanted to mention a parallel project. At the same time that we writing ready the grant application package, the mayor as I mentioned formed the tree advisory commission and they have begun a tree canopy assessment. So that project is only a six months project and it's going to wrap up this fall.

So it was also funded – actually, publicly funded and as I mentioned that you know, we know that the trees are single solutions for multiple problems, air quality, water quality and heat. And so, the school district was an active partner with us in helping to fund that canopy study.

So part of the – another thing that I'm doing out of my office is offering a stipend program, a matching program for our MSD school district to help incentivize green infrastructure and anything to decrease urban heat island, as well as water quality and air quality.

OK. So the next thing you know that also kind of helps us this is that the tree commission is working on you know looking towards the future strategies in the next year or so to come up with a tree protective ordinance. And again, that's another example of something that must be a collaborative process and you don't want to turn into a political hot potato because it's really just about the good of the community and building a quality of life for the future.

And you know, kind of going back to the beginning of this process, I think when you are writing an application for a grant, it's – there's sometimes some challenges around that and obviously, finding the matching funds to do that were kind of part of the biggest challenge because we – as you can see, sort of the timeline I've painted, we – really, the stars aligned and we are able to get this project off the ground, the community input, the buy-in, the funding to make this project happen.

So and the knots and bolts, everything just kind of fell into place after the main hurdle was getting that grant application submitted. So I feel like we've been really fortunate that you know, the heat study came out when it did, the Office of Sustainability started when it did and the projects just fell on the place where we were ready to do this. And along with the findings of the tree canopy assessment which we're going to have by the end of this year, we're really poised to have a lot of data that's very current, very cutting-edge, even more refined and detailed than what the city's got two, three, four, five years ago.

So getting both of these studies in really close together I think is going to really position us to make a big impact and try to reduce our urban heating on and plan for the future. I think one of the things that we learned from Dr. Stone is that this does take a while in terms of specially trees, we all love trees but when you look at the growth cycle, it may take some time.

You know it's really rapid reduction strategy but obviously, that's something that we're seriously interested in. And then, if you like for us, going with cool roofs and cool pavement, coatings and that kind of thing will be something we will try to push as more of a near-term, you know even in the 2 to 3 year range that we can do this pretty quick results.

Slide 9: Thank you!

Maria Koetter: So that's pretty much where we are, where we've been and thanks again for giving me the chance to speak here. Here's my contact information and feel free to reach out if you have questions or anything that I can do to help. I'll be happy to support.

Victoria Ludwig: Great. Thanks, Maria. That was really interesting presentation because it's – I think it's great to see how you're doing it very comprehensively in terms of the heat management

plan and starting from a study from – starting with the science and the research. And we look forward to continuing to follow your efforts, wish you luck in the future and maybe we can have you back in a year or so after you have implemented some activities, and we look forward to that.

Maria Koetter: Great. Thank you, us too.

Poll Question #2

Victoria Ludwig: Then, great. OK, before we go on to the next speaker, we wanted to do another poll question. So get ready to vote. Please let us know at what stage of the heat island mitigation process are you?

Are you not even talking about it yet? Are you starting to talk about it or develop a plan? Are you assessing the impacts? Are you identifying and selecting adaptation – mitigation and adaptation strategies or are you implementing strategies? So we'll wait a minute or so to let you vote. Please do that.

OK, thank you for voting. Let's look at the results here. We have – it looks like the majority of people are starting to talk about it or develop a plan, about 1/3. The second highest answer is not even talking about it. So we're really glad you're on the webinar today, 12 percent and 13 percent roughly equal our assessing the impacts and identifying strategies, and 21 percent are implementing strategies. That's great. Thank you for all your efforts and for answering.