Capital Region Urban Heat Island Project

**Community Meeting Presentation Outline/Facilitator Agenda**

**20-min Presentation**

This facilitator agenda is meant to walk you through giving this presentation to your community or organization at a gathering or meeting. The talking points are suggested. Feel free to edit based on the audience and community priorities of the group you are presenting to.

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| **1 Min** | Introduction |

**Slide 1**

* Today I will be sharing the results of a project that was conducted by local organizations and agencies in our region to explore the effects of heat and increasing heat pollution and what that does to the health and safety of our community.
* This issue is of particular importance to me because I know first-hand how heat affects our day to day life in the Capital Region. (*We* *recommend telling an anecdote about your personal experiences here to form a closer connection for the audience. For example, if your neighborhood lacks a mature tree canopy you can point out how it feels so much hotter when you walk across a school parking lot or a grocery store parking lot in the summer as opposed to walking through the forest or a nearby park with mature trees.)*
* To better understand the risks of excessive heat and potential cooling solutions across the region, the Sacramento Metropolitan Air Quality Management District (SMAQMD) and the Local Government Commission (LGC) led the Capital Region Urban Heat Island Mitigation Project developed the Regional Heat Pollution Reduction Plan which identifies and prioritizes Urban Heat Island mitigation measures for the transportation sector.
* This project was funded by a Caltrans SB-1 Climate Adaptation Grant which was awarded in December 2017. The project was completed in February 2020.

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| **2 Min** | Defining UHI & the Dangers of Heat |

**Slide 2**

* The *urban heat island* (UHI) effect is the warming of urbanized areas compared to their surroundings, vegetated, and rural regions.
* In cities and suburban areas, traditional building and infrastructure materials — like concrete and asphalt pavements — retain more heat during the day, absorbing it like a sponge, and release it back into the environment, increasing surrounding temperatures.
* This makes urban areas an “island” of heat that is hotter than the more rural areas that surround them.

**Slide 3**

* Coupled with summer heat, urban heat can be dangerous - exacerbating existing health conditions and impacting other aspects of our day-to-day.
* **HEALTH**: For example, heat can exacerbate:
  + **Asthma** — Heat and light react to increase ozone (smog) pollution levels, leading to poor air quality. The increase in ozone pollution makes it more difficult to breathe and can cause asthma flare-ups.
    - The American Lung Association’s [2018 State of the Air](http://www.lung.org/assets/documents/healthy-air/state-of-the-air/sota-2018-full.pdf) ranked the Sacramento-Roseville region as the 5th most ozone-polluted urban area in the entire United States (compared to 8th in 2017).
  + **Cardiac Disease** — Some medications, combined with heat, can hinder the body’s ability to regulate temperature, increasing the risk of death. This is because the body’s natural heat regulation strategies, radiation and evaporation, stress the heart. Having a weakened heart during a heat wave event increases the chances for heat stroke.
  + **Diabetes** — Heat can lead to fluctuations in blood sugar levels. For example, increased temperatures can increase blood sugar if not properly hydrated (glucose levels become more concentrated, which triggers further urination, and thus dehydration). However, higher body temperatures can also lower blood sugar levels, because higher temperatures dilate blood vessels, which in turn enhance insulin absorption.
  + **Pre-existing conditions** — Heat not only worsens pre-existing illnesses but can also be deadly. The elderly and young are vulnerable to heat stroke but it can also affect young healthy people exercising or working outdoors. In addition, heat is linked with premature births and low-birth weights for pregnant women.
* Heat also:
  + **Costs** more with reliance on air conditioning and fans, which uses more electricity, stresses power generation and transmission systems, and increases greenhouse gas emissions.
  + **Impacts productivity** by reducing labor and agriculture productivity which hurts our economy.
  + **Impairs water quality** and increases the volume of water required to keep trees and landscape alive and healthy.

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| **2 Min** | Regional Context |

**Slide 4**   
*This slide shows the Sacramento Region and the impacts of the heat island effect for this region in particular*

* Why is this important to be aware of in our region in particular?
* Although the traditional term “urban heat island” implies that the effects are isolated to urban city centers, the Capital Region is unique. Due to the Delta Breeze — a movement of cooler, ocean air via the Delta into hotter valley air — heat is not confined to the urban areas. The excess heat produced from the built environment and the use of internal combustion engines migrates to the surrounding areas in the northern and eastern parts of the region, including: Citrus Heights, North Sacramento, Del Paso Heights, Arden-Arcade, Carmichael, North Highlands, Rio Linda, Fair Oaks, El Dorado Hills, Roseville, Folsom, Rocklin.
* The urban heat island effect is therefore a **regional heat pollution problem**. It is not just the urban center of Sacramento that needs to be concerned. In other words, addressing the impacts of heat in the region requires a multi-agency and multi-jurisdictional collaborative effort.

**Slide 5**

* It’s safe to say that our region as a whole is getting hotter even without the urban heat island effect. This is due to climate change. Currently the County has an average of 6 days above 100 Degrees per year and 1 above 105. By late century that could be as high as 36 days above 105 Degrees. EVEN IF we limit warming to 2 degree C which will take a large effort of mitigation measures across our region, we will still see an increase in extreme heat days.

**Slide 6**

* Discussion with audience about personal experiences with excessive heat
* ASK THE AUDIENCE:
  + *Think back to the last few summers in your community.* *Do you remember experiencing excessive heat? If so, when and where? How did you feel in the moment? [Share personal experience if want to/have time to kick things off]* 
    - *An example: “When I walk across the parking lot to go to Safeway/Raley’s/etc. I really feel how the heat is exacerbated on the dark asphalt”*
    - *“When I go to our neighborhood pool that does not have any shade trees, I can only lounge in the chair for a few minutes before it gets overwhelming”*
    - *“I can only use the bike trail before 8 am in the summers, otherwise it is unbearable to ride or jog on.”*

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| **2 Min** | Cooling Measures |

***Slide 7***

* Albedo is how much solar heat a surface reflects. Dark surfaces like asphalt have low albedo so they absorb more heat. This is why roads can become warped during extreme heat days.
* A solution to reduce the UHI is to have more high albedo surfaces, especially in urban areas. In cities, there are many sidewalks, roofs, and roads that are visible when you view a city from a birds eye view.

**Slide 8**

* **Cool roofs** are one example of high albedo solutions. They help reflect solar heat away from your house on a hot sunny day.
  + This keeps your house cooler, so you use up to 20% less A/C and save more energy. A cool roof can be up to 50°F cooler than a conventional dark roof. They come in all types of materials and colors.
  + Cool roofs cost the same or slightly more than normal roofs and can help you save money on your energy bills. A cool roof typically pays for itself in 2-5 years.
* **Cool Pavements** are being piloted in LA
* **Solar Panels on roofs** have dual benefits as they turn the roof space into valuable real estate to produce clean, renewable energy.

**Slide 9**

* **Increasing tree canopy and green spaces** in a city will also reduce the UHI. This is because plants provide shade and cooling and reduce the amount of low albedo surfaces that are exposed.
  + Sacramento is known as the City of Trees but our canopy still needs to grow to reduce the temperature increases that are modeled to occur over the next century.
  + Additionally, some neighborhoods in Sacramento have a much larger tree canopy than others. Often neighborhoods with a lower socio-economic status have less tree canopies, exacerbating the burden of climate change on these already vulnerable communities.
* **Green roofs and living walls** are solutions to introduce more green spaces into a city.
* **Bus Shelters**: many neighborhoods in Sacramento has bus shelters that aren’t shaded which puts more of a burden on residents that rely on public transportation
* **Shade Parking Lot Ordinance**: With a few exceptions, chapter 17.612.040 requires that trees be planted and maintained in order to provide a minimum of 50% shade over a parking lot in Sacramento. This raises the albedo of parking lots which typically absorb a lot of heat.

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| **3 Min** | Modeling |

**Slide 10**

* Dr. Haider Taha from Altostratus, a local company with expertise in urban heat island effects modeled how the region could reduce the UHI effect using different combinations of strategies.
* What happens when we adopt these strategies?
  + This map shows the regional cooling benefits from:
  + Increasing tree canopy by +12% (e.g., going from 10% to 22% tree canopy cover)
  + And increasing albedo by 0.35 for roofs and pavements.

**Slide 11**

* Cool pavements in Sacramento’s underserved communities can lower road surface temperatures by as much as 24°F
* They can also cool air temperatures by as much as 9°F
* Benefits: Cooler temperatures for people outdoors
* Cleaner air & improved water quality
* Driver safety
* Brighter streets at night
* Reduced maintenance costs for pavement repair

**Slide 12**

* A key takeaway was that the reduction of extreme heat was more effective when communities work together, reinforcing the fact that the UHI effect is a region effect.
* This graph shows how much more effective it is to implement solutions regionally
* TEE UP SLIDE 13 - Ask: What are your ***ideas for reducing heat?***
  + *If the audience needs prompting ask them about small things, they can do around their house to feel cooler or to reduce their impact such as using the Delta Breeze to cool their house at night rather than use air conditioners.*

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| **5 Min** | What can you do? |

**Slide 13**

* While it is necessary for our municipalities to work regionally, we also wanted to share the steps that individuals, both renters and homeowners could take with a range of low-effort and low-cost to high-effort and higher cost. Action can be taken at any level that works for the community member!
* Things that require an investment but have immense rewards include installing a cool roof or choosing an electric vehicle instead of an internal combustion engine for your next car.
* **Electric Vehicles**: Because they don’t have a combustion engine, electric vehicles emit 80% less heat than gasoline-powered cars. Thus, EVs contribute less to the urban heat island effect. The state provides up to $7,000 to those interested in purchasing or leasing a new electric vehicle (CleanVehicleRebate.org). SMAQMD is launching a new EV incentive program in April 2020 which will provide incentives to make it easier for those who own older, more pollution cars to save money on upgrading to an EV. To cruise for less commitment, consider an electric car share like GIG (gigcarshare.com) which is active in the Sacramento region.
* **Cool roofs** help reflect solar heat away from your house on a hot sunny day. This keeps your house cooler, so you need less A/C and save more energy. A cool roof can be up to 50°F cooler than a conventional dark roof. They come in all types of materials and colors, and can be used on roofs of all sizes and shapes. Cool roofs cost the same or slightly more than normal roofs and can help you save money on your energy bills. A cool roof typically pays for itself in 2-5 years.
* **Shade Trees:** SMUD and the Sacramento Tree Foundation work together to provide free trees and workshops to help strategically plant trees to shade your home. Trees as well as rain gardens and other green spaces can help beautify communities, increase property values, clean the air and water, support local wildlife, and reduce the urban heat island effect.
  + **Trees and water use:** Trees provide so many benefits to communities that it’s important to water them during droughts - they actually need less water than lawns. A handy water saving tip: Collect the water from your shower as it’s heating up to water your plants.

**Slide 14**

**Low-cost and lower effort but still effective:**

* **Active/public transportation**: Biking, walking, and enjoying public transportation are zero- or low-carbon mobility choices, and also provide healthy exercise. Gasoline-powered cars emit air pollution, greenhouse gases, and waste heat as part of vehicle exhaust, worsening air quality and warming neighborhoods.
* **Replace light bulbs with LEDs**: Sound simple and we already know to do it because of energy savings, but this is a two-for! CFLs and incandescent also emit heat and that's probably not what you want when it's hot out. LEDs do not emit large quantities of heat.
* **Don't use your stove in summer months**: it uses energy, but more importantly, it releases heat into your house. Use that microwave, toaster oven, instant pot, air fryer, or rice cooker. They put off much less heat!
* **Advocacy**: Ask your local representatives and local government for more street trees, biking and walking paths, community gardens, cool pavements, and other neighborhood services that can help to reduce the urban heat island.

**Slide 15**

* In addition to implementing these specific measures that help cool the region, we can all do our part as community members to 1) become more aware of the resources around us, and 2) build up the capacity and cohesion within our own communities to be more resilient to heat.
* COHESION
  + One place to start is to connect with your neighbors, whether it’s through meetings like this or by knocking on your neighbor’s door to get to know them better or just being aware of who in your community who might be more vulnerable to heat, you can take small actions like checking up on your most vulnerable neighbors, the elderly and children, who more susceptible to heat stroke on excessive heat days.
* RESOURCES
  + On excessive heat days, you can also look up the location of your closest cooling center. If there is not an official cooling center, think of what can serve as an emergency cooling center such as a school, library, or house of faith. In extreme weather events such as wildfires, there's community hubs that could be key to community resiliency and provide clean air and conditioned air.
  + If you add shade trees to your property, it not only helps you, but has a full community benefit. Your house and street will save money on cooling as the tree provides cooling to the surrounding area. If multiple households participate, the neighborhood's shade canopy will increase which we already know has immense cooling benefits. Planting a tree may sound daunting if you haven’t done it before but there are tons of resources in the area that can provide help. The Sacramento Tree Foundation will help you identify the best tree for your location and provide instruction on how to care for it while it establishes itself in your yard. They have a long standing partnership with SMUD to provide shade trees for free. We have brochures if you want to find out more.
  + [SMUD rebates](https://www.smud.org/en/Rebates-and-Savings-Tips): SMUD offers a variety of rebates to make your home more energy efficient
  + If you are a [PG&E](https://www.pge.com/en_US/residential/save-energy-money/resources/summer-tips/summer-tips.page) customer they also offer their own suite of rebates for energy efficiency and utility assistance for both electricity and gas.

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| **5 Min** | Questions/Discussion |

* Open up the floor for community members to discuss the presentation and key takeaways
* If the community members have questions that you cannot answer, you can provide LGC and SMAQMD’s contact information and we would be happy to hear from them
* This would be a great time to discuss an active that your community group or neighborhood could take. Observe what topics were of most interest to this group. Are they passionate about improving the tree canopy? Are they excited about advocating for cool pavement to be installed at the neighborhood park? Are they looking for their neighborhood to have improved bike lanes?
* You could see if there is interest in organizing an event or day of action around these topics such as a neighborhood tree planting.
* This is also a great opportunity to engage your neighborhoods elected official or city representative around priority topics and to share with those officials what your neighborhood is passionate about.