

Healthy Urban Environments (HUE) Initiative
Arizona State University



Project Update: Third Quarter, 2020

Date of Report: January 15, 2020

Project Overview

As outlined in the Healthy Urban Environments (HUE) Initiative proposal, ASU has launched HUE as a solutions-focused research, policy and technology incubator to rapidly develop, test and deploy heat-mitigation and air-quality improvement strategies and technologies. This will be accomplished through four project components: 1) research, solutions and innovation incubator; 1) communication, networking and solutions hub; 3) implementation and evaluation of new insight in real world contexts; and 4) public, workforce and management education and capacity building. The schedule for delivery of each component as proposed is shown below; we will report on progress for each of these components separately in the following pages.

HUE Work Plan - Gantt Chart	Project Year	1				2				3			
	Calendar Year	2019		2020		2021		2022					
	Project Quarters	1	2	3	4	1	2	3	4	1	2	3	4
Communication, networking and solutions hub													
Convene ASU heat and air quality researchers													
Create Network of Concerned Parties and Advisory Council													
Aggregate relevant plans from local and external entities													
Research, solutions and innovation incubator													
Laboratory Investigations - Year 1													
Laboratory Investigations - Year 2													
Laboratory Investigations - Year 3													
Pilot Field Experiments													
Model Proposed Interventions													
Behavioral Research on Perceptions of Heat and Air Quality													
Implementation and Evaluation													
Scale-up of Proposed Interventions													
Evaluate Changes of Perceptions													
Public, workforce, and management education + capacity building													
Workforce, Public, and Management Educational Programs													
Share Solutions for Relevant Stakeholders													
Offer Training for New Jobs													

Figure 1. Gantt Chart for ASU Healthy Urban Environments project deliverables.

1. Research, Solutions and Innovation Incubator

Overview:

ASU will develop a research, solutions and innovation incubator to test novel heat and air pollution mitigation technologies; deploy field demonstration projects to quantify the heat and air quality mitigation effectiveness; and modeling projects to simulate the impact of heat and air quality mitigation approaches.

January 15, 2020 Status:

In our third quarter, HUE began the process of expanding our incubator capacity. As outlined in our project proposal, we seek to underwrite high-quality, community-engaged, solutions-oriented projects that will be selected from submitted proposals. In an effort to explicitly engage non-university efforts and partners, our second cohort of Solutions Projects (2020-2021) will give priority to proposals that originate from or prominently feature project leadership from non-ASU organizations. We formally launched our Request for Proposals (RFP) on December 5, 2019 and followed this announcement up with an informational, interactive webinar on December 16, 2019. During the webinar, HUE leadership reviewed the proposal guidelines and provided examples to help guide successful proposal development. A question and answer section allowed participants to clarify any additional items. All of our proposal materials (including a recording of the webinar) have been consolidated into an easy to access page on our website: <https://sustainability.asu.edu/hue/funding/>. We look forward to reviewing these proposals and formalizing our second cohort of projects shortly after the RFP priority deadline of February 14, 2020.

We are excited to announce that we have continued to expand our team through two additional hiring development. First, Dr. Melissa Guardaro has been hired as a full-time Assistant Research Professor and will be starting work on January 12, 2020. Previously, Dr. Guardaro served as a Graduate Student Assistant with HUE. She has since completed her graduate training and will now be working in a unique joint appointment between HUE and the ASU Knowledge Exchange for Resilience (KER). We expect that she will make important contributions to our project's increasing focus on community engagement given her extensive record of heat engagement in Maricopa County.

Second, we have hired Rachel Braun to join our team as a Postdoctoral Scholar in June 2020. Rachel is currently a Ph.D. student at University of Arizona studying atmospheric particulate matter and air quality. In addition, Rachel has experience with stakeholder engagement and community-related components to this work, a key focus for HUE. Her expertise will transfer well to the technical and communications/engagement needs of the HUE team.

2. Communication, Networking and Solutions Hub

Overview:

Arizona State University (ASU) will convene workshops to share mitigation approaches, initiate new inquiries to expand on urban heat and air quality improvement strategies, and provide summative reports on relevant community strategies for interventions for urban heat and air quality.

January 15, 2020 Status:

In the third quarter of our project, HUE held its Fall 2019 Solutions Workshop. This workshop had three primary achievements:

1. First, it served to formally convene the HUE Network of Concerned Parties – a diverse working group focused on collaboratively working towards advancing urban heat and air quality mitigation solutions. Going forward, the Network will support working groups engaged in planning and action around specific intervention opportunities, communicating best practices, and training future practitioners.
2. Second, the Solutions Workshop provided HUE leadership and researchers an opportunity to deliver updates to key stakeholders on current HUE efforts, as well as communicate intentions and expectations regarding future funding and engagement opportunities sponsored by HUE.
3. Finally, the Solutions Workshop was explicitly designed to solicit project ideas from our partners and stakeholders as well as provide feedback on current HUE solution projects. This interactive “listening” session gave participants the opportunity to “pitch” potential collaborative project ideas to the audience that HUE could support in future rounds of funding as well as strategies to strengthen current HUE projects. Additionally, following the formal pitches we facilitated less structured discussion regarding feedback on how HUE can best serve its stakeholder community.

All together, we had 39 attendees representing 26 different local groups - municipalities, agencies, private entities, businesses, non-profits, and community groups. This also included a contingent of 10 ASU researchers. The Fall 2019 Solutions workshop was a success in launching our stakeholder network, and familiarizing our stakeholders with our mission and capacity to develop local solutions and implementation with regards to heat and air quality. We will be leveraging this stakeholder network in future HUE activities and as well as soliciting collaborative project proposals from our stakeholders in early 2020 (see Section 1 for details).

3. Implementation and Evaluation of New Insights in Real World Context

Overview:

ASU will test new solutions developed as part of HUE; conduct surveys and in-depth interviews with community members; and enable Technology Transfer and Intellectual Property licensing on all projects sponsored by HUE.

January 15, 2020 Status:

We have several exciting developments in implementation and evaluation to share across our current portfolio of HUE Solutions Projects.

1. Our engagement with South Phoenix school Paideia Academy has successfully characterized the pre-intervention (baseline) conditions for their playspace site. This includes data on particulate matter, local climate, student photo stories, and physical activity. These and other data will be used as key indicators to track solutions

performance with regards to heat, air quality and health when the playspace undergoes construction and redesign in the coming months.

2. We have developed the first functional version of the HeatReady Standards certification which is currently being tested with key stakeholders across Maricopa County. These testing interviews are being used to calibrate and formalize the evaluation process. Following testing, this novel heat planning tool will transition into official use to evaluate and certify the first group of select municipalities in Maricopa County in 2020.
3. The first field deployment and monitoring campaign for our Enzyme Induced Calcium Precipitation (EICP) dust suppression technique is underway. The project team deployed a suite of sensors to the site at the Republic Services Landfill (Apache Junction, AZ) for calibration in mid-October 2019. In December 2019 the first EICP treatment was administered and monitoring is currently underway to evaluate the performance of the technique.
4. The effort to develop a technique that will add Nitrous Oxide (NOx) capture functionality to solar panels has established a working laboratory set up to test NOx photochemical transformation. A specific photocatalyst and application technique have been identified for the initial laboratory experiments. This will enable an evaluation of the chosen approach and verify the efficacy of scaling this technique to real-world implementation.
5. A detailed 3D model of the Edison Eastlake neighborhood in Phoenix has been developed. This will enable a high-resolution simulation of how different proposed designs will impact the thermal comfort and heat characteristics across the community as it undergoes redevelopment soon. Additionally, weather stations were deployed and baseline observational data is being collected to provide a comparison point for post-intervention results.
6. Our efforts to better understand how shade works in different contexts are well underway. After an initial consultation with the City of Tempe, project leads collected field data on shade performance throughout Summer 2019 and have since processed the observed data. Shade efficacy is currently being analyzed using four important thermal metrics. Results from this analysis will be shared with the City of Tempe to enable more effective shade planning for upcoming real-world design interventions.

4. Public, Workforce, and Management Education and Capacity Building

Overview:

ASU will enable capacity through development and implementation of workshops aimed at stakeholders and community members; create online modules to be integrated into existing ASU outreach programs; and develop material for new workforce training programs.

January 15, 2020 Status:

Our October 2019 Solutions workshop (detailed in section 3 above) provided an important opportunity to guide our Public, Workforce, and Education Capacity Building efforts. During the meeting, numerous members of the Network of Concerned Parties gave formal pitches on potential collaboration opportunities, including ideas such as common data portals and

coordinated heat action plans. Further, there were several key learning outcomes regarding our future capacity building efforts:

1. The recognition of a general knowledge barrier around heat and air quality. Practitioners described a lack of easily accessible, coordinated resources (data, literature, reports, interactive tools) to understand heat and air quality and the synergies between these two dynamics.
2. A need for regional coordination regarding heat and air quality – consistent frameworks, networks or approaches that can be used to connect efforts taking place across various projects, solutions, or stakeholders involved in heat/air quality mitigation.
3. The importance of using place-based, localized interventions at the community and neighborhood scale in order to provide important innovative case studies, demonstrate best practices, and address the larger regional issues over time.

Further, HUE has begun to engage with the MedTech Accelerator to explore possible avenues of collaboration. While nothing concrete has been established yet, project leadership have held meetings to identify alignment between the two projects and move forward on planning for future joint efforts.