City of Phoenix Cool Corridors Program
Policy Recommendations from the Urban Heat Island & Tree and Shade (UHITS) Subcommittee of the Environmental Quality and Sustainability Commission (EQSC).

Updated: 4/08/2021

Summary

The purpose of this memo is to communicate policy recommendations on development of a City of Phoenix Cool Corridors Program from the Urban Heat Island & Tree and Shade (UHITS) Subcommittee of the Environmental Quality and Sustainability Commission (EQSC).

Rising temperatures are a threat to more and more residents of our city each year. Academic studies and media reports have noted that while every resident is at risk during hot weather, low income and minority residents are particularly vulnerable and experience a disproportionate impact--both during normal summer days and during extreme heat events.

The UHITS Subcommittee has been investigating the Cool Corridors Program by examining feasibility, implementation, and lessons learned from related programs that could mitigate the impacts of rising extreme heat on city residents. The Subcommittee also recognizes that the Cool Corridors Program would support existing citywide goals related to sustainability, public health, and alternative modes of transportation. As such, the UHITS Subcommittee encourages the EQSC to support the following city actions to guide the development and implementation of a citywide Cool Corridors Program:

1. City Council approval of ($1.5M) funding for the Streets Transportation Department Cool Corridors Program in the 2021-22 City Budget.
2. City Council approval of ($500K) funding for a new Office of Heat Response and Mitigation in the 2021-22 City Budget, which will include a Chief Heat Response Officer, a Tree and Shade Administrator and a Shade Infrastructure Manager.
3. Charge the new Office of Heat Response and Mitigation 1) with overseeing the implementation of a citywide Cool Corridors Program through coordination with the Streets Transportation Department and other appropriate city departments, 2) creating strategic partnerships with non-governmental organizations to facilitate Cool Corridor initiatives, and 3) pursuing, drafting, and championing policies and recommendations that guide the development and implementation of a citywide Cool Corridors Program.
4. Create and adopt a citywide Cool Corridors Policy in alignment with the Cool Corridors Program vision contained in these recommendations that prioritizes corridor development for populations most at risk from extreme heat and those that may experience a disproportionate impact from heat.
5. Include a citywide Cool Corridors Program as a key resilience measure to help mitigate the effects of urban heat as part of the city's Climate Action Plan.

An important consideration in reviewing these recommendations is that existing programs can be leveraged to assist in implementing the Cool Corridors vision. While the Streets Transportation Department has made the first attempt by requesting specific funds for shade tree plantings, other departments will play a valuable role in ensuring the entire community can participate in the vision for Cool Corridors. For example, the Planning Department can help ensure private development integrates Cool Corridor features in their development, and neighborhood grant programs can help encourage residents to contribute toward the Cool Corridors goal. Existing regulations and grants could be restructured to incentivize community stakeholders to participate. One example is to have dedicated set-aside funds within neighborhood grant programs that highly encourage residents to engage in and complement the Cool Corridors initiative.

The UHITS Subcommittee is supportive of the development of the Cool Corridors Program and appreciates the opportunity to provide meaningful input. We are pleased to provide an initial set of recommendations for the EQSC to

consider, and note that these recommendations were unanimously approved by the Subcommittee at the April 6, 2021 UHITS Subcommittee meeting.

The UHITS Subcommittee looks forward to program updates from City staff and offers support as the Cool Corridor Program progresses.

Background and Existing Corridor Identification Methodology

The City of Phoenix Street Transportation Department's Street Maintenance Division is leading the development of the city's *Cool Corridors Project*. Staff has indicated the effort will likely involve multiple divisions of the Streets Transportation Department and other City departments. The Streets Transportation Department submitted a 2021 budget request for $1,483,000 to add 1,800 trees in up to nine miles of arterial streets. The budget decision will be made by the Phoenix City Council in June 2021, following public hearings.

City staff, with input from research partners at ASU, is currently developing a methodology for cool corridor identification that would be used to implement the Cool Corridors Program. Prior to submitting the supplemental budget request, staff examined potential corridors with large numbers of pedestrian and bicycle traffic that would be well served by additional shade tree plantings. Initial corridors identified were generally arterial streets with high transit ridership which are surrounded by areas with high numbers of zero vehicle households.

While segments of streets were identified, constraints to planting trees along roadways were also encountered during initial assessment. These constraints included limited right-of-way space, utility conflicts, and conflicting sight line issues with driveways. Adding trees to these corridors could include large hurdles including acquiring additional right-of-way or narrowing the roadway to create planting areas. Staff recognized additional work is needed to determine how to accommodate trees in these areas.

These challenges aside, city staff are working between now and June 2021, when, and if, Council approves the budget request, to finalize an identification and prioritization process for Cool Corridors.

Recommendations

While the Streets Transportation Department has made a great initial push for initiating the Cool Corridors Program the UHITS Subcommittee has recommendations for implementing the concept of Cool Corridors beyond the City's initial corridor identification process and implementation action of planting trees. The UHITS Subcommittee recommends the following activities to maximize corridor functionality for the benefit of residents that most need them:

1. **Cool Corridor Definition.** The city should clearly define the parameters of a successful cool corridor and illustrate current best practices and examples in Phoenix. This is important to assure that the goals and benefits of investing in these corridors are clear to the public and staff.
2. **Cool Corridor Identification and Prioritization of Neighborhoods and Street Segments.** The UHITS Subcommittee urges the city to prioritize the health and well-being of heat vulnerable communities when deciding on strategies to reduce the impact of heat to ensure those most at risk are protected. With input from existing data and residents, we encourage staff to identify neighborhoods that are the highest priorities for cool corridor investments, recognizing that some places in the city will have much greater needs than others. Within selected neighborhoods, staff should work with communities and other experts identify the priority/feasible street segments for cool corridor investments, recognizing that residents have valuable information on site specific needs and considerations.
3. **Community / Stakeholder Engagement.** A robust community engagement process would help determine how to prioritize routes, remedy conflicting priorities, and ensure that community and health inequities are addressed in the corridor identification process. Community stakeholders, such as universities, non-governmental organizations, and community advocacy groups should continue to be central to the corridor identification process, as they could contribute data and other resources that would help improve program success.

4. **Evaluation and Accountability**. Staff are encouraged to implement protocol for routinely assessing the success of the Cool Corridors Program and to assign responsibility for program success to one or more staff members as part of annual program evaluations.

Cool Corridor Definition

To suggest a working definition for a "cool corridor", the UHITS subcommittee gathered information from multiple sources, including MAG's Active Transportation Plan Toolbox, the Heat Action Planning Guide for Greater Phoenix[1] produced by the Nature Conservancy, and various ASU research initiatives.

The UHITS Subcommittee identified the following overarching goal for the Cool Corridors Program in the Climate Action Plan Framework (November 2020), which it supports: "Create a network of cool corridors in vulnerable communities to facilitate movement from residents' homes to their places of employment, education, and play."

The UHITS Subcommittee offers several additions to this conceptualization of cool corridors, and recommends that roadways serving as "cool corridors" would have the following characteristics:

1. Cool Corridors are approximately one-mile long walkways, pathways or trails adjacent and/or parallel to arterial streets, that are designed to serve residents who walk, bike, and use transit. Collector or local streets, and various pathways also could serve as cool corridors that provide important linkages with cool corridor arterials.
2. Cool Corridors offer residents of all ages and abilities relief from hot weather through the provisioning of natural and engineered shade, use of green infrastructure and other features that lower daytime air temperature, availability of benches, drinking water foundations, and other features to facilitate rest and recovery, and communications services to facilitate information exchange between the city and residents, including emergency call functionality. Cool Corridors could have a combination of public and private features that provide shade or reduce extreme heat such as: landscaping in the public right-of-way, landscaping in private property, public art, cool pavement, and misters.
3. Cool Corridors, at a minimum, meet the "Good" shade coverage target for pedestrian routes identified in the MAG Active Transportation[2] toolbox: 30% shade coverage as measured during the hottest times of the day. The target shade coverage for all Cool Corridors is 60%, consistent with MAG's "Excellent" benchmark.
4. Cool Corridor investments recognize the need for all city residents to have access to safe and comfortable walking routes near their homes and places of work and play, as well as the differential exposures that some residents have based on their employment, resources, preferences, schedules, and other factors. As such, cool corridor investments are prioritized to serve residents who most actively use, or depend on, active and public transportation.
5. Cool Corridors help connect residents to critical services including but not limited to schools, places of employment, places of worship, places of recreation, grocery stores, medical services. In addition, Cool Corridors may serve as connectors for popular walkways, pathways or trails.
6. Cool Corridor investments and implementation align with and support other existing local and regional initiatives, programs, and goals, including the Phoenix Climate Action Plan Framework, MAG's Active Transportation Plan, Arizona's Climate and Health Adaptation Plan, the Street Transportation's Department right-of-way tree plantings, public art projects, various zoning codes or design guidelines for private development, the Love Your Block Program, and the Block Watch Grant Program.
7. Cool Corridors include information displays, signs, and/or other infrastructure designed to educate the broader public about the Cool Corridors Program, guide residents and visitors to important cooling resources and other city services, and more generally highlight the city's role as a national leader in building resilience to extreme heat.

[1] https://repository.asu.edu/items/54600

[2] https://www.azmag.gov/Programs/Transportation/Active-Transportation/Active-Transportation-Plan/Active-Transportation-Toolbox/Pedestrian-Infrastructure/Shade-and-Thermal-Comfort

8. Cool Corridors are designed and implemented in a manner consistent with the culture and context of local residents, following best practices established in the Heat Action Planning Guide for Greater Phoenix[2] and similar resources.

Cool Corridor Identification and Prioritization of Neighborhoods and Street Segments

Mortality and morbidity records, social surveys, community workshops, and many academic studies consistently demonstrate that heat disproportionately impacts certain communities and populations in Arizona. Furthermore, surface and air temperatures can highly vary from one neighborhood to the next as a consequence of different land uses, infrastructure, historical investment, and other factors. While everyone can be at risk of experiencing discomfort, illness, or death because of the heat, targeted investments are likely to realize larger returns with respect to health, productivity, and quality of life.

The UHITS Subcommittee agrees that the current methodology of evaluating city arterials with high transit ridership and zero vehicle households is valuable to help identify possible street segments for cool corridor investments. However, we recommend additional data and considerations be added to the corridor identification methodology.

The UHITS Subcommittee recommends that priority candidates for Cool Corridor investment be identified by using available data and regularly supplemented as new data become available. The City of Phoenix Street Transportation Department has already created a tool that could greatly benefit Cool Corridor location Identification, the Tree and Shade Prioritization Map[3]. In addition, results from prior and ongoing ASU research projects are available to support corridor identification, including maps of street segments with higher pedestrian and bicycle use, community perspectives on locations needing cooling investments, and neighborhoods with higher social vulnerability and incidence of heat-related illnesses. Some of these products are already integrated into the city's tree shade prioritization map (referenced above).

While the UHITS Subcommittee understands the intent behind the city's Streets Transportation Department focusing on development of Cool Corridors along arterial streets with high transit ridership, we believe that these may be complemented by the development of Cool Corridor linkages on collector or local streets or along various pathways. Development of cool corridors linkages could be made possible through other city departments and partnerships with non-governmental organizations. For example, funding received through donations and grants could be used to connect arterial corridors to neighborhoods. Creation of corridor linkages would align with the modal priorities identified in Phoenix's *Comprehensive Bicycle Master Plan* and *Key Corridors Master Plan*.

Therefore, the UHITS subcommittee recommends the following methodology for identifying routes for cool corridor investment:

A. Rank all cool corridor candidates based on four existing data products:

a. City of Phoenix Heat Vulnerability Index scores for census tracts adjacent to corridors

b. Percent of housing units in census tracts adjacent to corridors with no cars

c. Number of estimated daily pedestrian trips along each corridor based on MAG/ASU simulation data

d. Current shade coverage and land surface temperature

Corridor prioritization would be based on the ranked sum of the rankings for each of the four variables. This exercise would ultimately produce a "master" prioritization list for the city's ~800 candidate corridors, which could then be filtered or sorted to identify priority corridors within particular geographic units (e.g., city council districts).

Prioritization lists produced by this process should subsequently be reviewed and adjusted based on input from key stakeholders including community members, NGOs, and city staff. The Tree and Shade Program Administration should

[3] https://phoenix.maps.arcgis.com/apps/webappviewer/index.html?id=2ce7ec39970c45e5861559318c7ee54e

further evaluate the prioritization list based on consistency with other existing city, regional, and state plans, opportunities to align with capital improvement projects, and other factors such as long term water availability. At least one public meeting should be held within each council district (or other geography) at which staff present the recommended corridor for cooling investments and reasons why that corridor was chosen and others were not. Factors to be considered during this phase include:

B. Obtain Community Site Specific Input for Data Sets

a. Community perspectives on locations needing cooling investments.

b. Community investments by NGO or other groups

c. Professional staff knowledge of existing and potential conflicts with other infrastructure/services

C. Evaluate Consistency with Existing City Plans

a. Phoenix's *Comprehensive Bicycle Master Plan*

b. Phoenix's *Key Corridors Master Plan*.

c. Phoenix's *Tree and Shade Master Plan*

d. Phoenix's *Climate Action Plan (upon approval by Council, anticipated Fall 2021)*

The UHITS Subcommittee believes the cool corridor identification process should take into consideration the recommended data and policies in planning documents listed above as well as input received via community and stakeholder engagement, as described below.

Community / Stakeholder Engagement

The UHITS Subcommittee recognizes that there are a number of challenges involved in the development of the Cool Corridors Program, including balancing the expectations of stakeholders, competing infrastructure priorities, and additional fiscal investment required to reverse prior decisions that have made tree planting difficult in certain neighborhoods. For example, it can be particularly hard to find tree planting opportunities in areas that have high heat vulnerability. Conflicting city priorities could deter benefits and investment in communities that experience a disproportionate impact from heat. For this reason, it is important that there is a clearly defined city policy for the Cool Corridors Program to guide conflicting priorities and address community and health inequities in a transparent process.

Community stakeholders, such as universities, non-governmental organizations, and community advocacy groups also can contribute data and resources and provide input in the corridor evaluation process. For example, ASU has been supporting the development of the City of Phoenix Cool Corridors Program in many areas with data and analysis and will continue to be a valuable partner in this program. The City of Phoenix should leverage relationships with community partners to ensure additive benefits of coordinating investments in areas that are heat vulnerable.

Finally, a community engagement process can help staff to prove the "lived-experience" of Phoenix residents and determine how to prioritize conflicting priorities for the benefit of residents.

Evaluation and Accountability

The UHITS Subcommittee advocates for regular evaluation and public communication of the progress of the cool corridor program, including the status of tree planting along prioritized corridors, the types of community engagement activities completed and feedback received therein, and health of trees planted as part of the cool corridors program. Specific staff members should be assigned primary responsibility for oversight of this program and program success should be considered as a part of annual performance evaluations for those staff members.