SHADE PHOENIX

An Action Plan for Trees and Built Shade

Draft for City Council Review
June 11, 2024

City of Phoenix

Acknowledgements

The City of Phoenix 2024 Shade Phoenix Plan is an update and expansion of the City's Tree and Shade Master Plan from 2010. The Plan reflects initiatives and perspectives from many local, regional, and national collaborators. It also draws content and direction from a network of related plans, including Phoenix's PlanPHX General Plan, Climate Action Plan, the Maricopa County Hazard Mitigation Plan, the Maricopa County Department of Public Health Strategic Plan for Climate and Health, the Heat Action Planning Guide for Greater Phoenix, and the Arizona Department of Health Services Climate and Health Adaptation Plan.

City of Phoenix Mayor and Council Offices

Office of Mayor Kate Gallego, Office of Ann O'Brien - District 1, Office of Jim Waring - District 2, Office of Debra Stark - District 3, Office of Laura Pastor - District 4, Office of Betty Guardado - District 5, Office of Kevin Robinson - District 6, Office of Carlos Galindo-Elvira – District 7, Office of Kesha Hodge Washington - District 8

City of Phoenix Departments and Functions

Arts & Culture, City Manager's Office, Communications, Office of Environmental Programs, Fire, Office of Heat Response and Mitigation, Office of Homeland Security and Emergency Management, Homeless Solutions, Housing, Human Services, Office of Innovation, Library, Valley Metro , Neighborhood Services, Parks and Recreation, Police, Office of Public Health, Public Transit, Public Works, Office of Sustainability, Volunteer Programs, Water Services, Planning and Development, Aviation, Streets, Community and Economic Development.

Local, Regional, and National Partners

Organizations listed below are partners in the tree and shade programs that the City operates or supports, have provided input regarding the content of this plan, and/or are responsible for programs or plans referenced in this document, or components thereof.

American Forests, American Society of Landscape Architecture Arizona Chapter, Arizona Community Tree Council, Arizona Conservation Corps, Arizona Cooperative Initiative, Arizona Department of Forestry and Fire Management, Arizona Landscape Contractors Association, Arizona Nursery Association, Arizona Public Service, Arizona State University, Arizona Sustainability Alliance, Artlink, Bartlett Tree Experts, Bloomberg Associates, Bloomberg Philanthropies, CHISPA AZ, Desert Tree Farm, Dusty Landscaping, Keep Phoenix Beautiful, Maricopa Association of Governments, Maricopa County, Phoenix Metro Urban Forestry Roundtable, Resilient Cities Catalyst, Salt River Project, The Design Laboratory, The Nature Conservancy, Treeland Nurseries, Trees Matter, U.S. Forest Service, University of Arizona, University of California Los Angeles, Unlimited Potential, Venture Café Phoenix, Watershed Management Group, West Coast Arborist, Whitfill Nursery

VISION

A future where all residents and visitors to Phoenix experience the benefits of trees and built shade throughout the city.

VALUES

Shade Phoenix is anchored around a set of core values that shaped its development and will guide its implementation.

1. **Focus on people first.** Target actions to keep people safe and focus on areas where shade can have the greatest impact on human health and wellbeing, with a focus on vulnerable populations
2. **Recognize that shade (built and natural) is a critical infrastructure and a service** provided to residents by public and private assets
3. **Lead with an environmental justice/equity lens and address historical inequities**
4. **Respect the unique desert landscape and heritage of the Sonoran Desert,** one of the most special places in the world
5. **Collaborate** within City government, between public and private actors, and with the communities of Phoenix. Increasing shade requires actions and support from all Phoenicians and the City of Phoenix
6. **Go beyond the status quo.** We cannot be afraid to innovate and take risks to change the current trajectory and realize our vision

EXECUTIVE SUMMARY

In the hottest large city in the country, shade is critical infrastructure and a community resource. Extreme heat presents a significant risk to the public health of Phoenicians. The Shade Phoenix draft plan is an update to and expansion of the City's 2010 Tree and Shade Master Plan and outlines the actions the City and its partners will take over the next five years to accelerate the creation and maintenance of shade in Phoenix. These actions explicitly focus on the city's most vulnerable residents and the places where people are outside the most. The plan will help us achieve our overarching vision to create a future where all residents and visitors to Phoenix experience the benefits of trees and built shade throughout the city.

Shade Phoenix is a data-driven plan, leveraging detailed analysis of citywide tree and shade data across City-owned, public, and private properties. At the census tract scale, tree canopy cover varies from 2% to 28%. The median census tract has 10.9% tree canopy. The plan includes findings from the City's first citywide shade analysis, which found 11% of the city is shaded at noon and 13% at 3pm on the summer solstice (the day with the most amount of sunshine). Sidewalks have 17% shade at noon and 20% at 3pm. Across Phoenix shade is not equally or equitably distributed.

The plan includes 37 actions across four strategy areas, addressing 13 strategic priorities. Collectively, these actions represent more than $50 million in allocated funding over the next five years and will result in more than 25,000 new trees and 500 new shade structures. This represents an almost doubling of the number of trees planted annually in Phoenix. More than 50% of the total investment will be made in low to moderate-income communities and 90% will be made in low, moderate, and middle-income communities. The four strategy areas are:

1. **Educate and Empower** - create a citywide movement around shade and heat and provide public education around sustainable and equitable shade practices.
2. **Expand Shade** - increase shade for children, increase shade on City-owned properties, increase shade on public right-of-way, and increase shade on private properties.
3. **Preserve and Maintain Existing Shade** - care for and maintain trees and shade structures on public property, strengthen code enforcement on private property, and increase City capacity to maintain trees and shade.
4. **Evaluate and Institutionalize** - monitor and evaluate progress on the Shade Phoenix Plan, strengthen organizational coordination and staff capacity, strengthen regulations, design standards, and guidelines, and create and expand pathways for careers in urban forestry.

Development of the draft Shade Phoenix plan was led by the City's Office of Heat Response and Mitigation and reflects the collective efforts of 26 City departments and offices. The Plan was shaped by significant public engagement that involved more than 2,000 community members who contributed input via public meetings and presentations, an online survey, engagement with Village Planning Committees, community events, and at workshops on heat and mobility held in collaboration with the Office of Sustainability. This engagement will continue over the summer as the draft plan is revised and finalized.

INTRODUCTION

In the hottest large city in the country, shade is critical infrastructure and a community resource. Shade, through trees and built structures, creates cool spaces that protect public health, improve quality of life, and strengthen community resilience. Maintaining and expanding Phoenix's shade will take proactive, coordinated action with residents, businesses, non-profit partners, and across City departments. This plan, an update to and expansion of the City's 2010 Tree and Shade Master Plan, outlines the concrete actions the City and its partners will take over the next five years to scale up and accelerate efforts to expand shade in Phoenix, with an explicit focus on the city's most vulnerable residents.

Extreme heat presents a significant risk to public health. Residents with underlying health issues are particularly vulnerable to the dangers of extreme heat (Harlan et al. 2006). Phoenix's future quality of life depends partly on maintaining and expanding publicly available shade, with a focus on where people are most exposed to outdoor heat and where there are high concentrations of vulnerable populations. However, heat is not the only environmental challenge facing Phoenix, and careful attention to the region's water resources, air quality, and ecology must be integral to planning efforts to increase shade from natural or engineered sources. New trees and shade structures must be resilient to many urban environmental challenges without making it harder for the region to thrive in the face of those challenges. Providing adequate shade is one of the most effective strategies to make hot outdoor urban environments safe and comfortable (Turner et al. 2023). Shade protects the human body from absorbing solar energy, which is the primary factor that determines outdoor thermal safety in hot weather. Shade also protects infrastructure from solar energy, which reduces the dangers of people interacting with hot surfaces and increases the life span of materials that degrade when exposed to the sun. Academic studies estimate that shade reduces the net heat burden on the human body by up to 70 degrees Fahrenheit (Middel et al. 2021, Turner et al. 2023).

Shade is not distributed equally or equitably across the city. As the city has developed, many communities have been built without adequate tree cover or shade structures at vital outdoor areas, such as transit stops, commercial corridors, or playgrounds. The City's first-ever citywide shade analysis found that 11% of the city is shaded at noon and 13% at 3 pm on the summer solstice. This does not reflect the areas where people are commonly outside. Taking out agricultural areas, vacant land, and natural preserves, all remaining property types in Phoenix have more than 25% shade coverage at noon on the summer solstice, led by Private Public Spaces (more than 50% shade) and single-family homes (over 40% shade).

Development of Shade Phoenix was led by the City of Phoenix Office of Heat Response and Mitigation and reflects the collective efforts of 26 City departments and offices. The Plan was shaped by more than 2,000 community members who contributed input via public meetings and presentations, an online survey, engagement with Village Planning Committees, community events, and at 16 workshops on heat and mobility held in collaboration with the Office of Sustainability. It was also shaped by the vision and content of the City of Phoenix 2010 Tree and Shade Master Plan. The Plan builds upon past work including the approval of the Walkable Urban Code in 2015, the adoption of a Memorandum of Understanding with American Forests on Tree Equity in 2021, the creation of the Office of Heat Response and Mitigation in 2021, and the implementation of the first Cool Corridor in 2022, among other important advances.

The 2010 Tree and Shade Master Plan has served as a primary policy tool related to tree and shade initiatives since its adoption and laid an important foundation for efforts to improve and maintain tree canopy and shade coverage in the City. Many of the principles and priorities from the 2010 Tree and Shade Master Plan remain relevant today and are reflected in the new Shade Phoenix Plan. The new plan also addresses community priorities that have emerged or become emphasized in the past 15 years, especially equity. In April 2021, a Memorandum of Understanding with American Forests was approved by City Council that augmented the vision of the 2010 Tree and Shade Plan with specific attention to equity.

Uncertainty around financial resources was presented as a major challenge in the 2010 plan as the City had made significant cuts to tree and shade initiatives during the Great Recession. At the time of its adoption, City Council directed staff to begin implementing the plan as subject to available financial resources. Today, approximately 70% of the actions from the 2010 Plan have been completed or are ongoing (see Appendix). The new Shade Phoenix Plan more explicitly identifies financial resources that are available to support its vision, strategies, and actions, and more clearly communicates the community benefits that will be achieved with those resources.

Shade Phoenix is a portfolio of community-inspired solutions to solve challenges at the intersection of extreme heat, public health, quality of life, and social justice. The Plan includes avenues for investments not only in the physical capital necessary to help Phoenix's hottest, most heat vulnerable neighborhoods become cooler, greener, and healthier, but also in the human capital that is essential for realizing the full suite of environmental and social benefits that natural and built shade can provide. Implementation of the Plan will ensure:

- Phoenicians understand the importance and value of trees and shade and how they can support them
- We increase shade for people where they need it most
- The community works together to support a thriving urban forest and well-maintained built shade
- Ongoing implementation and improvement of shade efforts to scale their impacts and maximize benefits

The 13 strategic priorities and 37 actions in the Plan represent more than $50 million in public and private investments over the next five years and will result in more 25,000 new trees and 500 new shade structures in Phoenix. Reflecting the values of the Plan, more than 50% of these will be planted or installed in low-income communities and more than 90% will be in low- to moderate-income communities. Together, these actions will help us achieve our overarching vision to create a future where all residents and visitors to Phoenix experience the benefits of trees and built shade throughout the city.

Tree Equity Score

One element central to shade cover, or the lack of it, is tree canopy cover. In 2021, American Forests developed the Tree Equity Score to address and identify environmental inequities in tree distribution common to cities across the United States. Tree Equity Score measures how well the critical benefits of urban tree canopy are reaching those who need them most. The score—which ranges from 0 to 100 and combines measures of tree canopy need and social, climate and health priority—establishes a democratized, equity-first standard to guide investment in communities living on low incomes, communities of color, and all those disproportionately affected by extreme heat, pollution and other environmental hazards.

In November 2023, American Forests launched the Maricopa County Tree Equity Score Analyzer (TESA), providing high resolution coverage to the region. This tool was custom-built for Maricopa County with input from local stakeholders and includes specific place-based metrics such as heat disparity, qualified census tracts, bus stops, light rails, schools and cooling centers. (Qualified census tracts are defined by the U.S. Department of Housing and Urban Development as those in which 50% or more of the households are income eligible and the population of all census tracts that satisfy this criterion does not exceed 20% of the total population of the respective area.) The TESA supports human-centered planning to improve low neighborhood Tree Equity Scores across Maricopa County.

Users first prioritize areas where they can have the greatest impact to address tree inequity. Next, they customize Tree Equity Score targets and create detailed tree planting and protection plans at the property level, informed by high resolution land cover. Then, they can use TESA to track progress and forecast project impacts at maturity.

This tool was custom-built for Maricopa County with input from a local stakeholder council and includes specific place-based metrics such as heat disparity, qualified census tracts, bus and light rail stops, schools and cooling centers. The TESA can help prioritize tree planting efforts, planting scenario capabilities, and impact reporting.

Figure 1. American Forests' Tree Equity Score Analyzer

COMMUNITY INPUT AND PARTNERSHIPS

A robust dialog around trees and shade has been ongoing since the City's first Tree and Shade Master Plan was adopted 2010. Engagement began in 2022 for the Shade Phoenix Plan and includes engagement through multiple modes within the City departmental stakeholders and stakeholders outside of the City on tree and shade topics as well. The goals, strategies, and actions included in Shade Phoenix were informed through ongoing engagements with community leaders and stakeholders' recommendations since 2010. Key documents such as budget hearings, the Phoenix General Plan, and the Climate Action Plan assisted in guiding the engagement process. Community engagement spanned a range of opportunities for communities and stakeholders to provide feedback on the city's current and future tree and shade goals in both English and Spanish. Phoenix residents shared their concerns, ideas, stories, and expertise through in-person and virtual engagement sessions and a survey focused on community feedback. The resulting feedback created and shaped the goals strategies, and actions of this plan. The level of response, passion, and time Phoenix residents have dedicated to our ongoing engagement demonstrates the community's commitment to partnering with the City for trees and shade and the importance of increasing shade and canopy coverage in the city to improve overall quality of life.

Modes of engagement included:

- Strategic engagement from the Office of Heat Response and Mitigation
    - Village Planning Committees (VPC)
    - Tree and Shade Community Questionnaire
    - Community Sustainability workshops with the Office of Sustainability
    - Innovate PHX Challenge with the Office of Innovation and Venture Café Phoenix
- Other community engagement forums and partner-led initiatives
    - Environmental Quality and Sustainability Commission (EQSC)
    - Budget Hearings
    - Community Events
    - City Council Community Meetings
    - The Nature Conservancy Heat Action Planning Guide

More than 2,000 community members have contributed input on current and future tree and shade efforts.

Village Planning Committee Meetings

The City engaged all 15 Village Planning Committees beginning in 2022. The 2022 VPC meeting discussions with OHRM solicited high level heat-related priorities from the community including trees and shade. The 2023 VPC meetings considered potential solutions and provided feedback on tree and shade goals. The feedback from the VPC echoes previous feedback on the need for more shade, concerns about tree maintenance and replacement, and funding sources to support tree and shade investments.

Community Sustainability Workshops

The city held 16 workshops on heat and mobility in collaboration with the Office of Sustainability, and two community-based organizations (Unlimited Potential and Resilient Cities Catalyst) in 2023. The workshops were attended by over 600 community members. The workshops, set up as listening sessions, sought community perspectives in two phases. The first phase focused on identifying mobility solutions and heat mitigation strategy prioritization, like prioritizing the reliability of the transit system. The second phase established deeper engagement with the community on heat and mobility challenges where the input from Phase 1 was gathered and validated to offer open-ended queries on community needs on these challenges. Examples include questions about where they want more trees, shade, cooling centers, and drinking water stations along with transit and mobility-oriented questions. Community members provided specific places where they would like more trees and shade, like at bus stops, community centers, schools, parks, and relevant cross streets.

Innovate PHX Challenge

The Office of Innovation launched the Innovate PHX Challenge to engage diverse communities in creating solutions to the city's most pressing challenges. In December 2023, Innovation partnered with the Office of Heat Response and Mitigation and Venture Café Phoenix to explore innovative manufactured shade solutions with more than 170 innovators, students, researchers, and residents from across the city. Five teams, with five participants each, refined their ideas for six hours and pitched solutions to a panel of judges, naming First Place, Second Place and Audience Choice winning teams. The City is currently working to prototype and test ideas from the Innovate Phoenix Challenge events.

Tree and Shade Community Feedback Questionnaire

The Tree and Shade Community Feedback Questionnaire is an ongoing questionnaire to understand Phoenix residents' perspectives on tree and shade efforts. The questionnaire, to date, has over 600 detailed responses from community members on the importance of trees and shade in their day-to-day life as well as where trees and shade should be prioritized in the city. Various newsletters, emails, and social media outlets pushed out the questionnaire to Phoenix Residents. Outreach is continuing, and the need for strategic outreach methods is recognized for multiple areas of the city.

Preliminary questionnaire findings suggest that there is a lack of both built and tree shade citywide (Figures 2 and 3). More detailed feedback outlines support for city tree and shade efforts, the importance of using the right shade in the right place, concerns about tree maintenance, and ensuring the use of native trees in planting efforts (Figure 4).

In the questionnaire, community members provided their thoughts in detail that reflect the deep care and concern residents have around trees and shade. Examples include:

> *<u>General support for tree and shade efforts</u>*
>
> *"SHADE CAN BE LIFE SAVING; IMPORTANT WORK YOU ARE DOING!"*
>
> *"This should be a high priority for the city, not only as a matter of human rights, but as preparation for continued climate change…Trees will make it more habitable for future residents, which will in turn allow Phoenix to continue to be a place people want to move to, not just for work, but as a place to call home and raise children."*

Right Shade, Right Place

"Built shade needs to be oriented to the location. It cannot simply be artistic - it must be functional and provide shade onto the ground at the specific times of days. Otherwise why build it."

"In order for Phoenix to be a walkable city…we need to make all of the pathways leading to mass transit shaded. Same goes for walking to a store or other essential services - it doesn't matter if there is something within a mile if you can't safely walk to it in the heat."

"Right type tree in right spot. Low water use plants work, just need the right design and placement."

"Please PLEASE use native trees. They are uniquely able to thrive and provide shade to this specific area. PLEASE DO NOT use Palm trees. Palm trees are NOT shade trees."

"All city streets and sidewalks should have native trees like Mesquites and Palo Verdes that create a good canopy to help with the heat index while also being drought tolerant."

Maintenance

"Hire enough city employees to take care of the dead trees or trees that need trimming before planting an overabundance"

"Trees that are planted [need to] have a maintenance and irrigation plan that is sustainable and consulted on by certified arborists and skilled professionals."

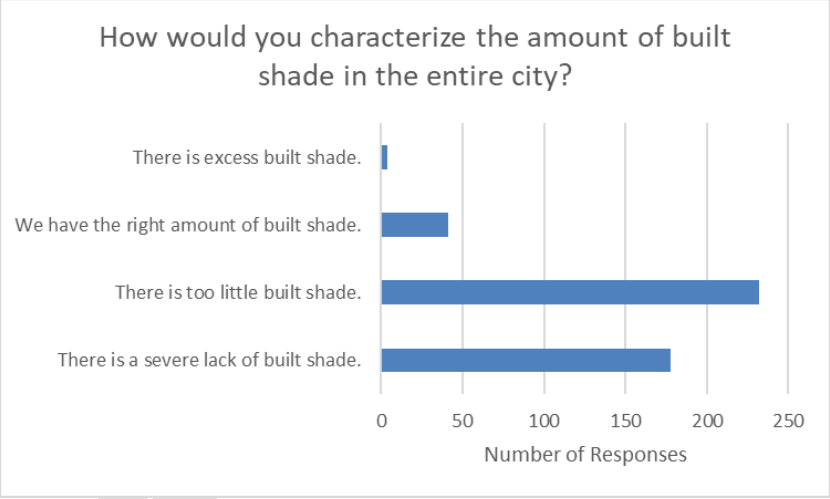


Figure 2. Community Characterization of Built Shade Citywide

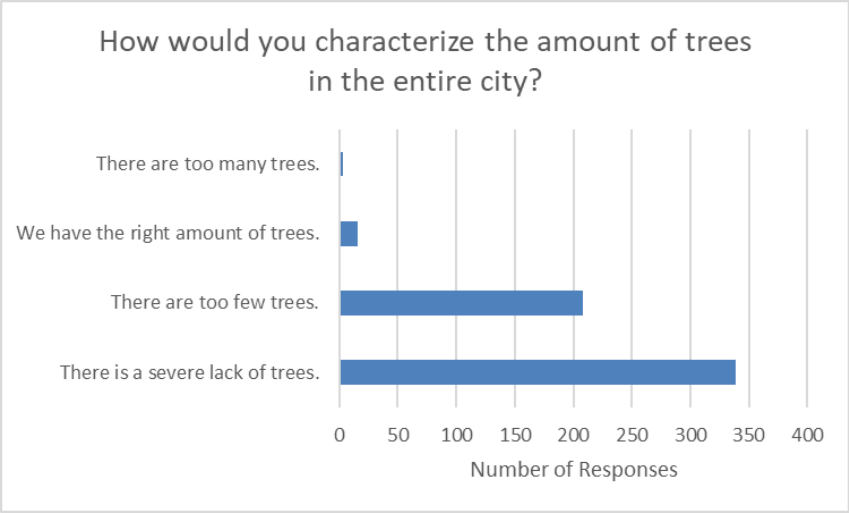


Figure 3. Community Characterization of Trees Citywide

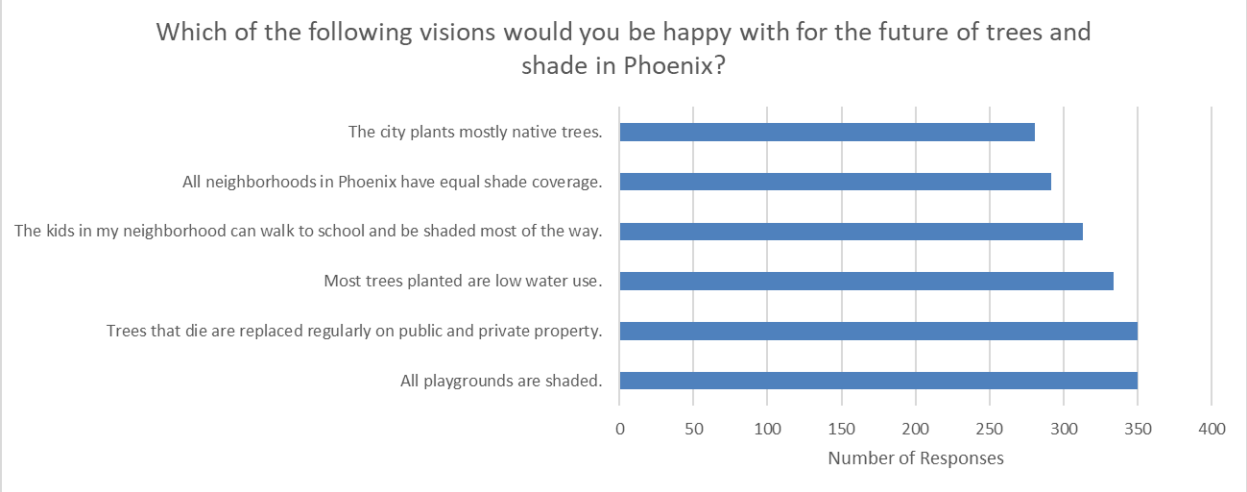


Figure 4. Questionnaire Response on Future Tree and Shade Visions in Phoenix

City Budget Hearings

The City of Phoenix conducts a rigorous public engagement process each year to inform the adoption of the City budget. This process includes a series of public hearings in every City Council district, as well as opportunities for comment and input through an online tool and at multiple City Council meetings. Requests for more trees and shade in Phoenix have been consistently voiced by community members at budget hearings in recent years. Notably, in spring 2021, increased investment in tree and shade initiatives ranked as the second most-requested action by the public in the hearings for the 2021-2022 City budget.

Public Advisory Boards and Committees

The City of Phoenix Environmental Quality and Sustainability Commission (EQSC) identifies and advises the Phoenix City Council on environmental quality and sustainability issues affecting the city and recommends to the City Council policies, positions, and action the city might take to address those issues in a manner that protects, promotes, restores, or enhances

the city's natural and built environments. In 2018, the EQSC established an Urban Heat Island and Tree Shade (UHITS) Subcommittee to make recommendations related to urban heat, including recommendations related to the implementation of the 2010 Tree and Shade Master Plan. The Urban Heat Island and Tree Shade Subcommittee performed this role through the first full year of the formation of the Office of Heat Response and Mitigation, at which time the subcommittee was sunset. Advisory functions related to urban heat and tree and shade programs remain within the purview of the full EQSC.

During their five years of service, members of the UHITS Subcommittee generated several formal recommendations to the EQSC. Full copies of UHITS recommendation memos are available on the City's webpage for EQSC. Key recommendations related to the Shade Phoenix Plan included:

- Establishment of an Urban Forest Interdepartmental Team of city employees to coordinate implementation of tree and shade initiatives
- Creation of a full-time Tree and Shade Administrator position
- Prioritization of tree and shade programs to benefit public transit stops, areas of populations vulnerable to extreme heat, and highly used walking routes
- Incorporation of Green Stormwater Infrastructure features designed to meet site-specific needs and characteristics
- Definitions, prioritization factors, stakeholder engagement strategies, and evaluation and accountability methods for the Cool Corridors program
- Development of a city-wide heat equity policy to serve as a framework for guiding future investments related to heat
- Delivery of annual reports from city staff to the public on the state of the urban forest and related programs and initiatives

UHITS members and community leaders also led and advanced other tree and shade-related initiatives in recent years, including landscape maintenance text amendments adopted by City Council in 2021.

Other City of Phoenix advisory boards and committees whose purview overlaps with the vision and goals of the Plan include, but are not limited to, the Citizens Transportation Commission, the Parks and Recreation Board, the Phoenix Arts and Culture Commission, and the Vision Zero Community Advisory Committee.

Partner-led Community Engagement and Research

Numerous initiatives led by other local and regional institutions have informed the strategies and actions of the Shade Phoenix Plan. Among those initiatives is the Nature's Cooling System project spearheaded by the Nature Conservancy and three community-based organizations, which produced the Heat Action Planning Guide for Greater Phoenix. The guide identifies mitigation and adaptation strategies to reduce heat directly and improve the ability of residents to live, work, and play in the heat. The guide was created through a participatory process. Workshops in the Edison-Eastlake Community and Lindo Park-Roesley Park area voiced the neighborhoods' concern for lack of shade on walking routes, at bus stops, and vacant lots, and financial burden and lack of resources for tree planting and shade. Previous and ongoing academic studies have also informed the Shade Phoenix Plan and will continue to support its updates and evaluation.

Partnerships: American Forests and Phoenix Metro Urban Forestry Roundtable

The vision, strategies, and actions in the Shade Phoenix Plan are also informed by and will be implemented with valued partnerships with local, regional, and national organizations. In March 2022, the Phoenix City Council adopted a resolution committing the City to a Tree Equity partnership agreement with American Forests, the nation's oldest nonprofit organization. Tree Equity is climate justice and health justice, and achieving Tree Equity means investing in communities with the most need by growing trees, creating jobs and implementing just policies such as Shade Phoenix. In November 2019, the City of Phoenix, American Forests, and the Arizona Sustainability Alliance founded the Phoenix Metro Urban Forestry Roundtable, a civic-led coalition that has grown to over 60 organizations with the goal of achieving Tree Equity in the Phoenix Metro area to help combat extreme heat and ensure historically disadvantaged community members have access to the benefits that trees provide. The Phoenix Metro Urban Forestry Roundtable consists of nonprofits, private sector entities, cities, county and state level representatives, and university stakeholder all focused on solving the underlying challenges needed to improve the tree canopy in the region.

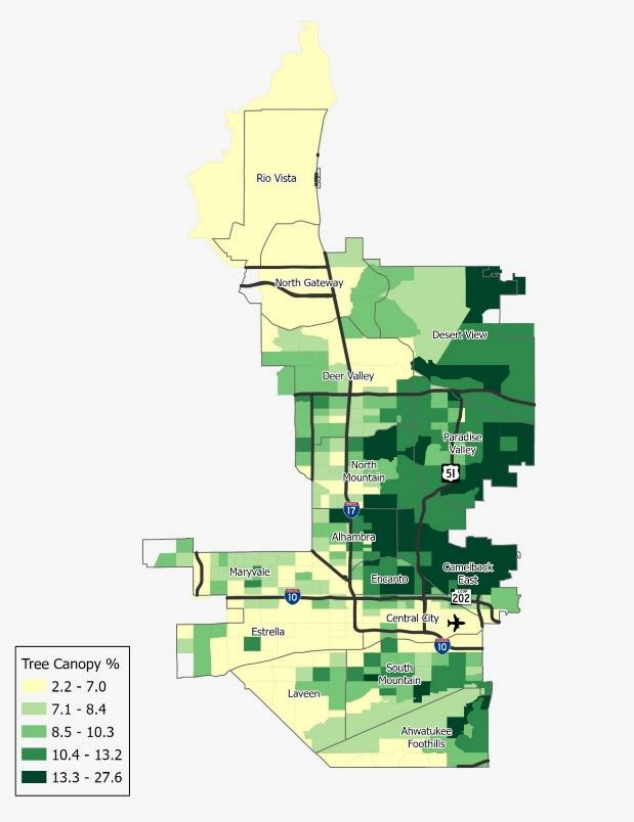
ASSESSMENT AND INVENTORY

Strategic planning and implementation of Phoenix's tree and shade programs is dependent upon accessible and actionable data. This section presents state-of-the-art analysis of tree and shade data available to support City decision-making and evaluation of progress. The section focuses both on community wide data as well as data specific to City-managed properties. All analysis is based on the most recently available, quality-controlled data products wherever possible. To understand Phoenician's access to shade from all sources, this Plan includes an assessment of shade coverage from built and natural sources using the City's first citywide shade analysis. As described in the Values and Introduction, equity is a fundamental consideration for the tree and shade analysis included in this Plan. While future work is needed to formally quantify tree and shade targets for different properties, land use categories, and neighborhoods in Phoenix, this section provides a detailed analysis of contemporary conditions that will guide future efforts.

Tree Canopy Analysis – Citywide

Tree canopy cover is highly variable across the City of Phoenix (Figure 5). The census tracts with the most tree canopy coverage are located in central and eastern portions of the city including the Arcadia and Encanto neighborhoods. In these areas, tree canopy cover often exceeds 15%, and in some cases, 25%. Tree canopy coverage is lowest in Central City South, in much of West Phoenix, and in many neighborhoods along the Interstate 17 Corridor. In those communities, tree canopy cover is often less than 5%, and in some cases, lower than 3%. There is more than a 10-fold difference in tree canopy cover between the census tract with the least tree coverage and the one with the highest tree canopy cover. The median tree canopy coverage at the census tract scale for Phoenix is 10.9%, which means that half of the census tracts in Phoenix have less than 10.9% tree canopy coverage. At the Village scale, overall tree canopy coverage is highest in Camelback East (14.8%), Paradise Valley (13.2%), and Alhambra (13.2%), and lowest in Central City (4.9%), Rio Vista (5.0%), and Estrella (5.3%). American Forests recommends 15% tree canopy cover for most neighborhoods in Phoenix; neighborhood and site-specific goals should be further developed in collaboration with community members and with recognition for land use, topography, and other factors.

Measuring tree canopy coverage on specific parcel and property types is important because there are different tree planting programs, funding sources, and policies that apply to different properties. Single-family residential property is one important parcel type to consider because single-family parcels account for a high percentage of the overall parcel land area of the City of Phoenix (39%), and people spend a high percentage of their time at home (U.S. Department of Labor, Bureau of Labor Statistics). The median single family residential property in Phoenix has 11% tree canopy cover, excluding the building footprint. The likelihood of single-family residential parcels having more or less tree canopy than this citywide median is also highly variable across Phoenix (Figure 6). There are neighborhoods in Phoenix where more than 90% of the properties have 11% tree canopy coverage or more, especially in central and eastern parts of the city. In other areas, almost no properties meet this citywide median, with some highly populated census tracts with less than one-third of properties above 11% tree canopy.. Summary statistics for different property types across the city are shown in Figure 7. Since 2012, the City, led by the Planning and Development Department, has focused on increasing tree canopy coverage in Transit Oriented Communities.



Village	Tree Canopy*
Ahwatukee Foothills	7.7
Alhambra	13.2
Camelback East	14.8
Central City	4.9
Deer Valley	7.9
Desert View	10.9
Encanto	12.4
Estrella	5.3
Laveen	6.8
Maryvale	6.7
North Gateway	6.1
North Mountain	10.6
Paradise Valley	13.2
Rio Vista	5.0
South Mountain	9.5

*Building footprints are not included in percentage calculation.

Figure 5. Tree Canopy by Census Tract
Derived from Google Environmental Insights Explorer high resolution tree canopy data from 2022 with building footprints removed from analysis (building footprint data from Microsoft 2019-2020 data).

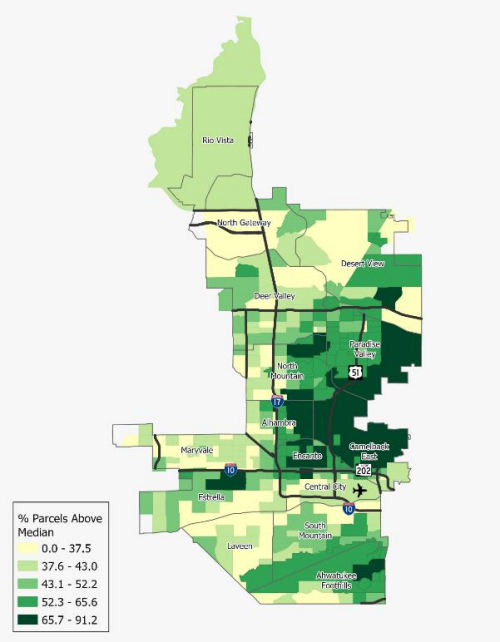


Figure 6. Parcels Above Median Tree Canopy % Among Single-Family Residential Parcels
Map shows the % of single-family residential parcels that exceed the median tree canopy of all single-family residential parcels (11%) in the city, aggregated to census tract. Tree canopy derived from Google Environmental Insights Explorer high resolution tree canopy data from 2022 with building footprints removed from analysis.

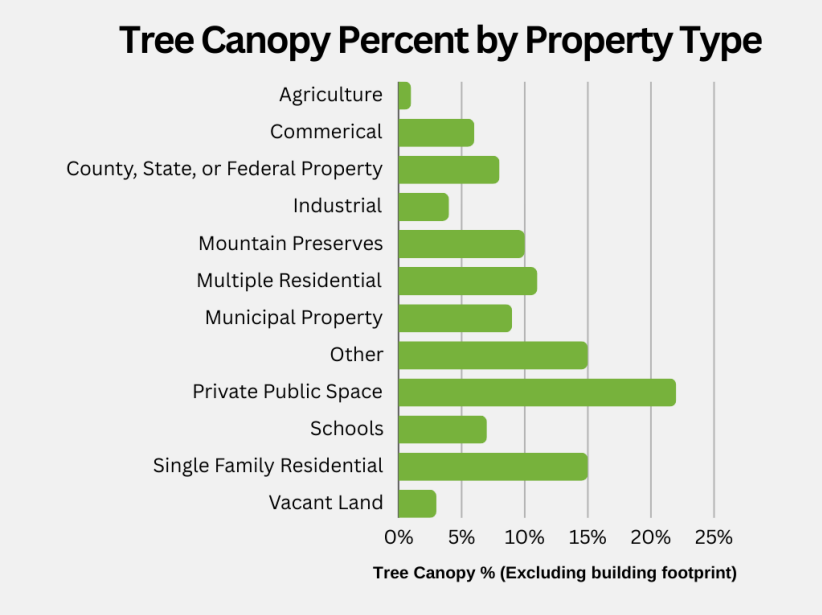
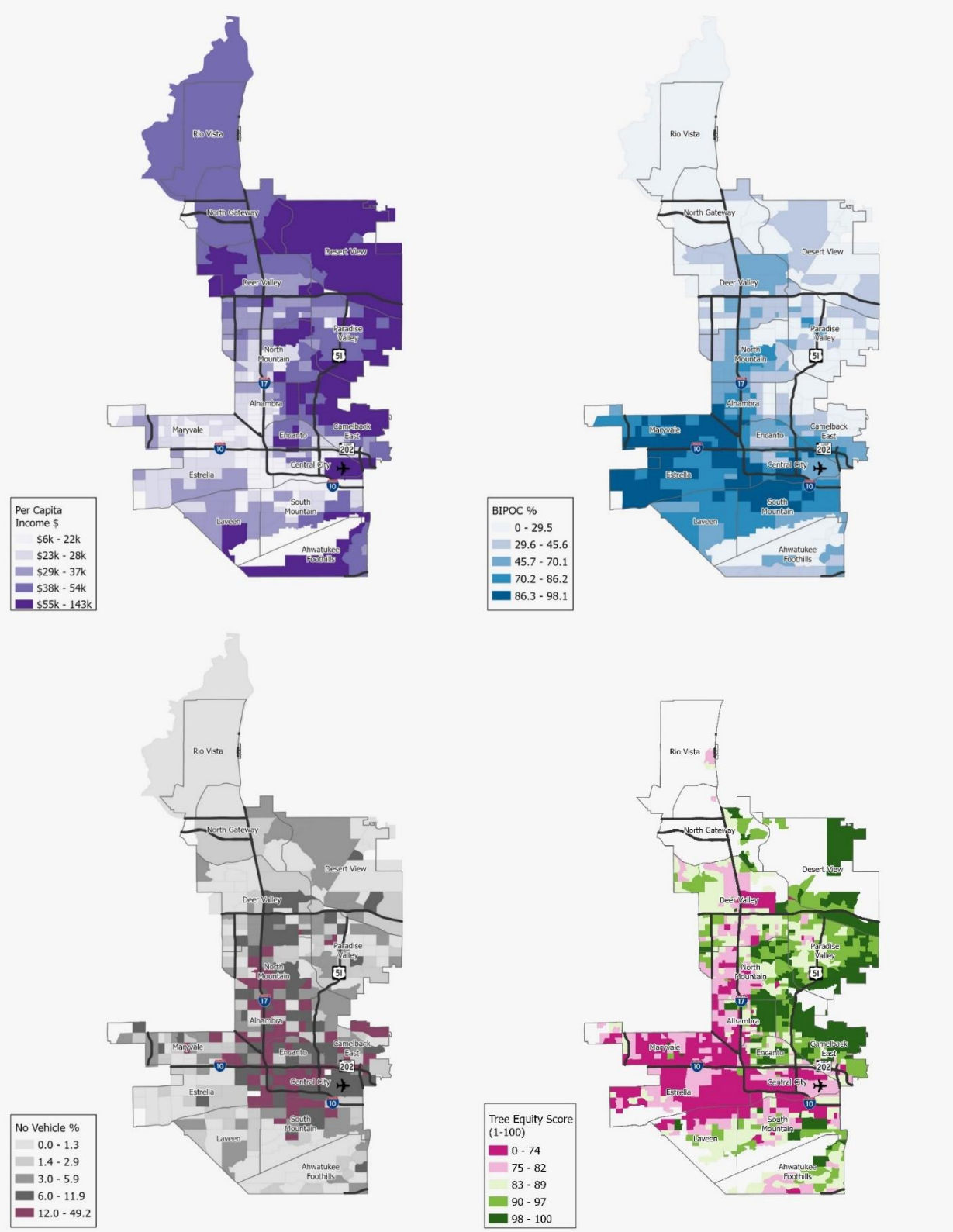


Figure 7. Tree Canopy Percent by Property Type
Average tree canopy % by parcel property type/groups. Using Google Tree canopy data (2022) with building footprints removed from analysis. Property types are groups of similar property use codes that we determined were sufficiently similar (not official groups). “Private public space” includes residential recreation centers/clubhouses, greenbelts/retention basins, open space and walkways owned by HOA/community, and golf courses.

The inequitable distribution of tree canopy coverage throughout Phoenix is closely related to many social and economic variables. Overall, tree canopy coverage is lower in communities with lower incomes, a higher percentage of people of color, and more people who do not own a personal vehicle (see Figures 8-10, Figure 12). This pattern, which has been well-documented in academic literature for many communities across the United States (Harlan et al. 2013; Gronlund, 2014; Mitchell & Chakraborty 2015), indicates that many communities which experience the greatest hardships in coping with heat and are exposed to heat more often are those in which tree canopy coverage is most severely lacking. Increasing tree canopy coverage in the neighborhoods where it is most needed was formally adopted as a City priority in 2021 with the adoption of the “Tree Equity Pledge” to American Forests. As a component of the City’s partnership with American Forests, City staff use the American Forests Tree Equity Score to help identify priority communities for tree and shade initiatives. The Tree Equity Score (Figure 11) combines multiple indicators of social, economic, and environmental conditions into one index on a 0-100 scale.



Figures 8-11. Per Capita Income; Percent of Population Identifying as Black, Indigenous, Hispanic, People of Color; Percent of Population with No Vehicle (U.S. Census Bureau 2022 5-year American Community Survey); Tree Equity Score (American Forests, 2017-2022).

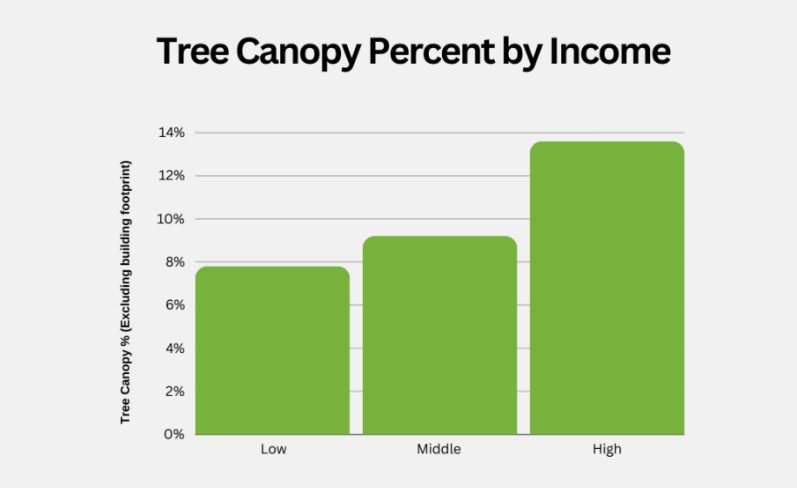


Figure 12. Average Tree Canopy Percent in Low, Middle, and High-Income Neighborhoods. Using Google Tree canopy data (2022) with building footprints removed from analysis.

Tree Canopy Analysis and Inventory – City of Phoenix Property

Shade Phoenix places a special emphasis on tree and shade actions for properties owned and managed by the City of Phoenix. Many City properties are highly used and valued public resources where people need and seek shade—especially the City's flatland parks and the areas of the streetscape right-of-way that are owned and managed by the City. The City of Phoenix owns approximately 8% of the total parcel area within city boundaries, excluding preserves (Figure 13). While this is a relatively small percentage of the total area of interest for tree and shade actions, it is a priority area because of its public purpose as well as for the imperative for the City to lead by example in providing effective shade in places where it is needed.

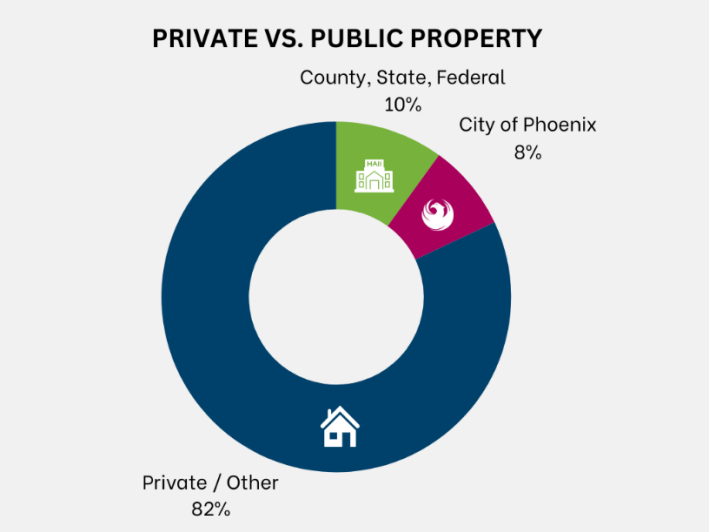


Figure 13. Private vs. Public Property in Phoenix
Based on parcel data property use codes from Maricopa County Tax Assessor database. Mountain preserves removed from analysis. Current version does not include any right of way, landscape maintenance areas, or any data that is not within parcel boundaries.

The City's most recent comprehensive tree inventory, which involves a professional measurement and assessment of every physical tree on City property (excluding mountain preserves), was completed in 2014. Portions of the inventory have been updated intermittently since that time. As of the most recent update, the City inventory included approximately 106,000 trees. However, as the previous inventory is now more than a decade old, an updated inventory is necessary to guide tree planting and maintenance efforts on City property. Completion of a new inventory is a proposed action item in this plan.

Over the past 14 years, the City has tracked and reported the number of trees planted and removed by the Street Transportation Department, Parks and Recreation Department, and Aviation Department, as part of the City's engagement with the Arbor Day Foundation for the Tree City USA Program. That reporting shows a total of 32,968 trees planted on City property since 2010 by those three departments. Tree removal due to damage from accidents, storms, or ageing tree, an important investment to protect public safety and promote a healthy urban forest, has resulted 21,222 trees lost on City property over the same time period (Figure 14). Modernizing reporting and tracking systems to more comprehensively understand and reduce preventable tree mortality is a proposed action item in this plan.

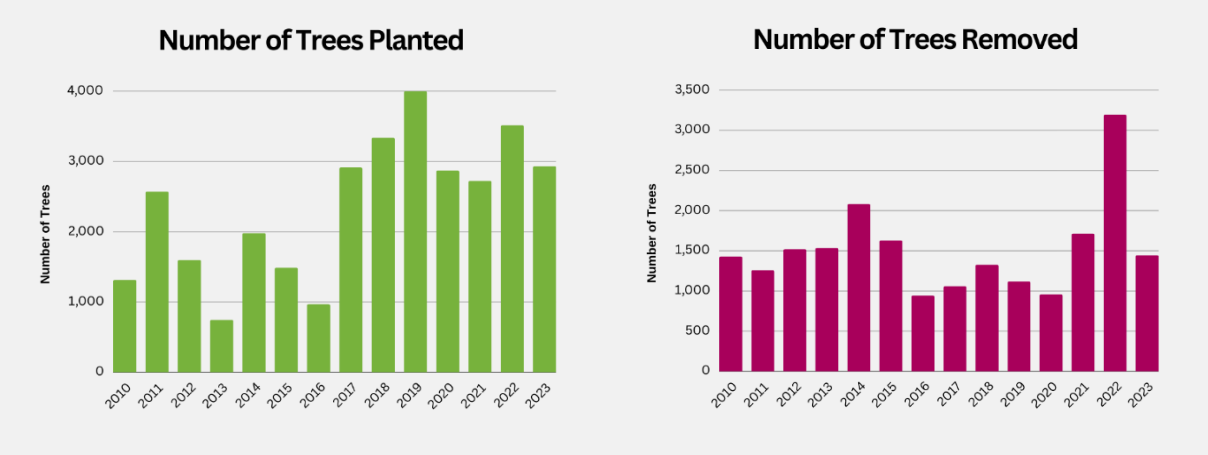


Figure 14. Tree Planted and Removed by the Parks and Recreation, Street Transportation, and Aviation Departments, 2010–2023.

Analysis of tree canopy coverage on City property provides a useful complement to the physical inventory to guide future City investment. Staff are completing a detailed analysis of tree and shade coverage and opportunities on all relevant City properties as a proposed action in this plan. One example of analysis of tree canopy coverage on City property is shown below.

The City manages approximately 55,293,336 square feet of public streetscape area as part of the Landscape Maintenance Area program. There are 13,700 unique Landscape Maintenance Areas across the city, which largely fall on the sides and medians of major arterial streets. Example overhead images with landscape maintenance areas highlighted are shown in Figure 15. Across the entire city, Landscape Maintenance Areas tend to be highly fragmented, interrupted by private property and infrastructure conflicts. The majority of Landscape Maintenance Areas are found along major arterial streetscapes in Phoenix; there is minimal Landscape Maintenance Area along collector and neighborhood streets.

Figure 15. Overhead imagery of arterial streets in Phoenix with Landscape Maintenance Areas highlighted in green.

As is the case for citywide tree canopy coverage, the percentage of tree canopy on the City-managed Landscape Maintenance Areas is highly variable (Figure 16). Tree canopy coverage is highest on all Landscape Maintenance Areas in the Camelback East and Encanto Villages, exceeding 15%. It is lowest in the Estrella Village (5.2%) and in Maryvale Village (8.2%). These tree canopy values include all landscape maintenance area types: Streetscape, Freeways, Canalscape, Other, and Roundabout.

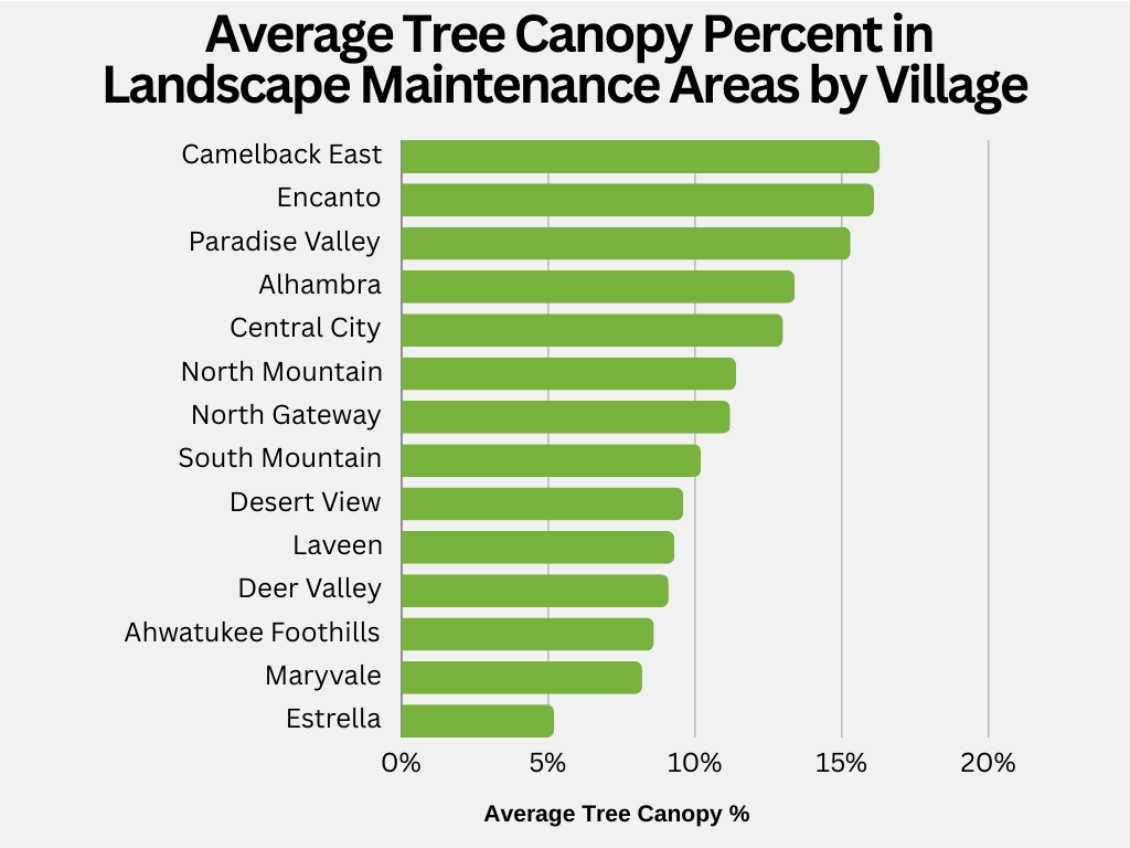


Figure 16. Landscape Maintenance Areas Tree Canopy by Village.
Tree canopy values in Landscape Maintenance Areas shown here include all landscape types: Streetscape, Freeways, Canalscape, Other, and Roundabout. Rio Vista does not encompass any Landscape Maintenance Areas, so it does not appear on the figure. Google Tree canopy data (2022) with building footprints removed from analysis.

Shade Analysis – Citywide

In the urban setting, shade is provided by a combination of natural and engineered sources. Advances in environmental monitoring systems and computational resources are enabling the generation of maps of shade coverage for entire metropolitan areas. In this plan, shade estimates for Phoenix are derived from a joint research project between the Luskin Center for Innovation at University of California Los Angeles and Arizona State University that models how sunlight is obstructed by the three-dimensional structure of the city (Buo et al. 2023). The shade estimates are based on sun angles on June 21 at noon, 3pm, and 6pm (see Figure 17 for an example).

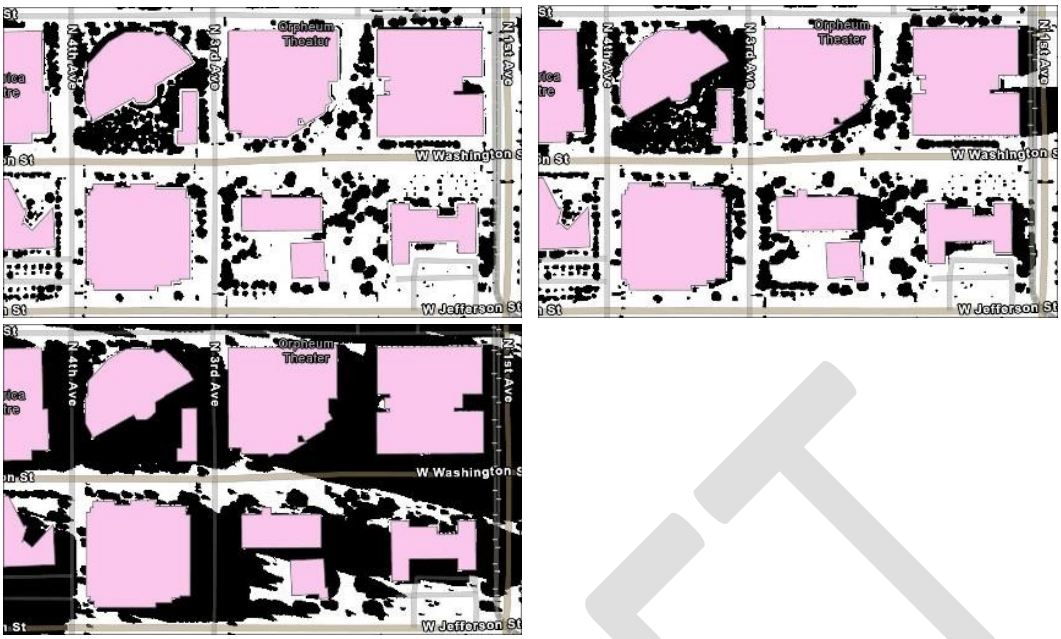


Figure 17. Shade estimates for an area of downtown Phoenix at noon, 3pm, and 6pm on June 21.

Approximately 11% of the City of Phoenix land area is estimated to be shaded at noon on the summer solstice; this fraction increases to 13% at 3pm and 28% at 6pm. Shade coverage, like tree canopy coverage, is highly variable throughout Phoenix. Shade coverage is highest in the Encanto, Camelback East, and Alhambra Villages (all exceeding 19% at 3pm), and lowest in the Rio Vista (3.5%), North Gateway (8.1%), and Laveen Villages (10.4%).

Shade estimates for particular land use types, such as residential, commercial, or City-owned can be used for policy guidance and program implementation. Pedestrian areas are identified by stakeholders as a high priority for shade, and the Maricopa Association of Governments has established recommendations for sidewalk shade coverage in the Phoenix Metropolitan Area. Current estimates for shade coverage on all sidewalks in the City of Phoenix is 17.4% at noon on the summer solstice, 19.7% at 3pm, and 31.2% at 6pm, based on data from the joint UCLA-ASU study referenced above (Buo et al. 2023). Shade estimates for different property types throughout Phoenix are shown in Figure 18.

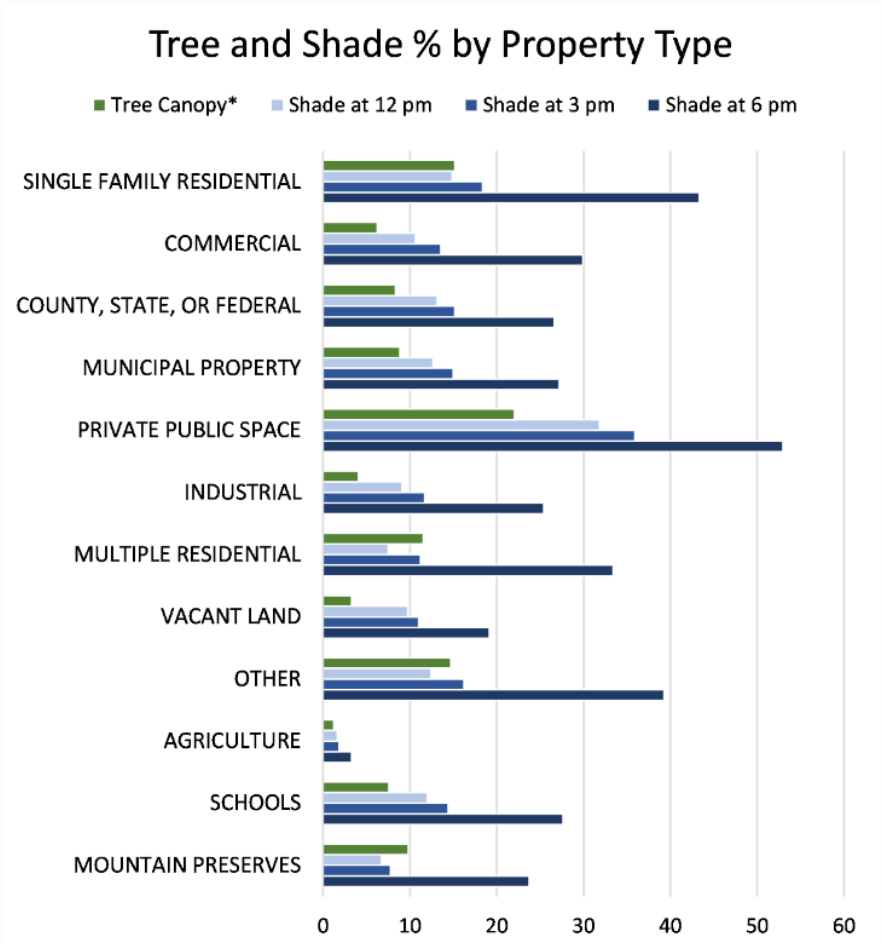


Figure 18. Tree and Shade Coverage by Property Type
Estimates are based on averages of parcels within each category of parcel types. Using Google Tree canopy data (2022) with building footprints removed from analysis and shade data from UCLA-ASU model (Buo et al. 2023).

Built Shade Analysis and Inventory – City of Phoenix Property

The City of Phoenix builds and maintains a wide variety of shade structures on its properties to help protect the public from heat and sunlight. A recommended action in this plan is the development of a comprehensive shade structure inventory for all City property. As of the publication of this plan, a preliminary inventory has been compiled with the shade structures available at City parks and the structures managed by the Public Transit Department at public bus stops.

There are currently 3,054 bus stops with shade shelters throughout the City of Phoenix, representing 75% of all city bus stops. The Villages with the highest percentage of shaded bus stops are those with higher transit ridership, including South Mountain, Encanto, and Alhambra (Figure 19). In those villages, nearly 80% of bus stops have shade structures. At City of Phoenix parks, there are 639 shade structures, including 530 ramadas and 109 shade canopies (see Figure 20).

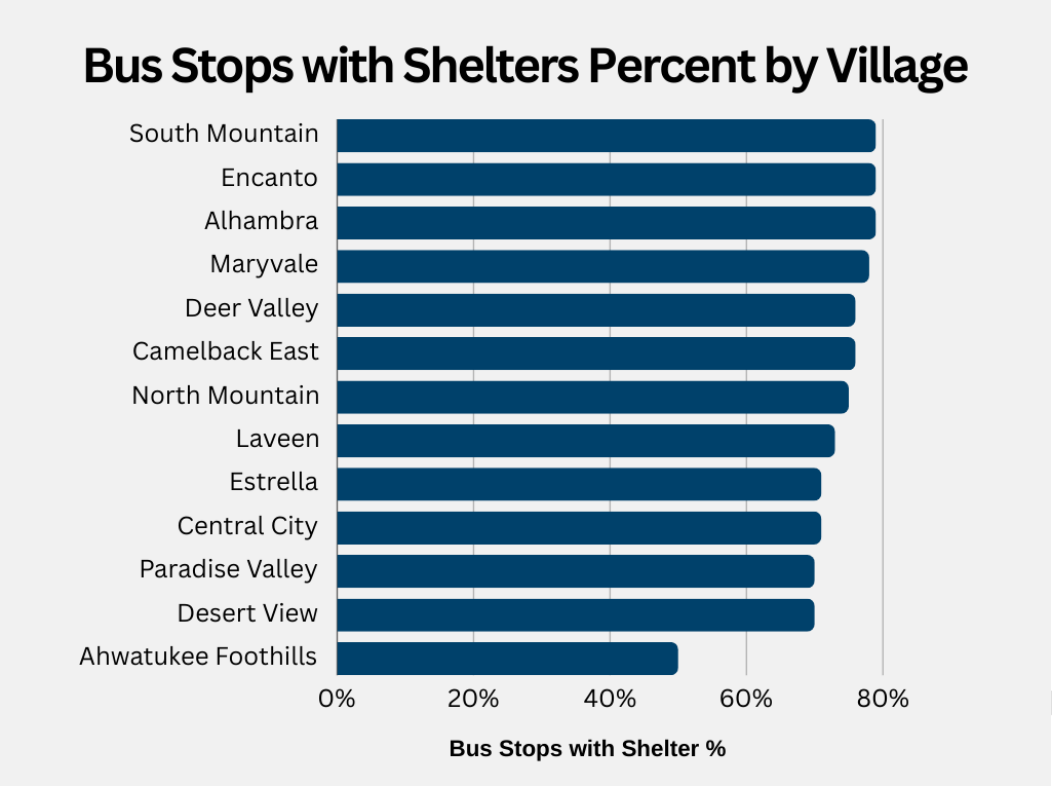


Figure 19. Bus Stops with Shelter Percent by Village.
Note: Rio Vista and North Gateway do not have any Valley Metro bus stops.


Figure 20. Shade structures at Margaret T. Hance Park

Shade availability on City Landscape Maintenance Areas in the public streetscape exceeds 25% at all hours of the day on the summer solstice and is greater than 35% at 6pm. At all hours of the day, shade coverage on City Landscape Maintenance Areas exceeds shade coverage on non-City managed sidewalk areas in Phoenix (Figure 21).

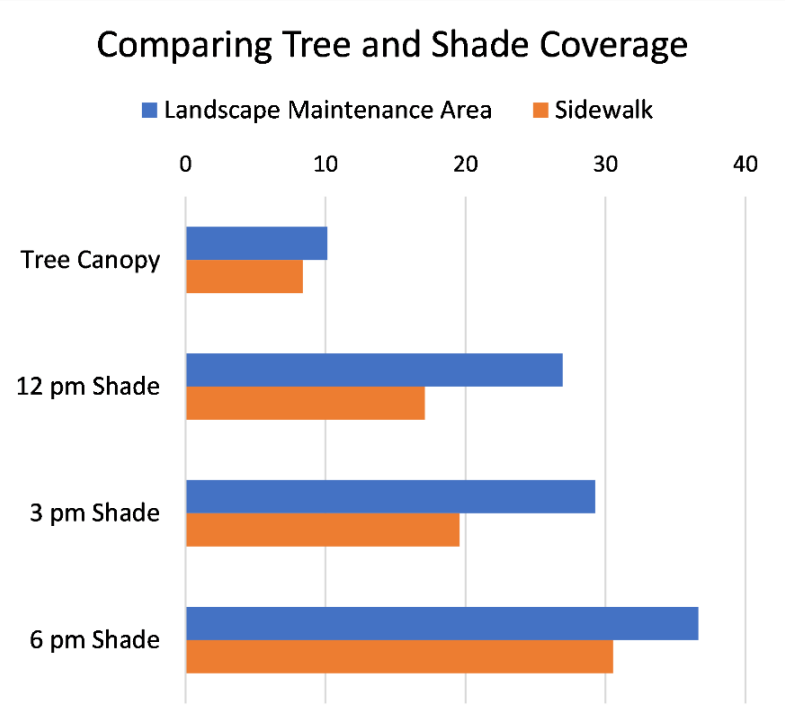


Figure 21. Tree and shade coverage on City-maintained Landscape Maintenance Areas compared to tree and shade on all sidewalks City-wide. Using Google Tree canopy data (2022) with building footprints removed from analysis and shade data from UCLA-ASU model (Buo et al. 2023).

ACHIEVING THE VISION: STRATEGIES AND ACTIONS

Increasing and caring for shade in the city is a long-term effort that will require all parts of our community/city. The City is committed to leading this effort to ensure Phoenix remains the most sustainable desert city in the U.S. and achieves the vision set forth in this plan. Shade Phoenix contains 13 strategic priorities and 37 actions the City and its partners will take across four key strategies: educate and empower residents and businesses, expand shade on public and private properties, maintain the built and natural shade we have, and evaluate and institutionalize these efforts. **Collectively, these actions represent more than $50 million in investments over five years and will result in more than 25,000 new trees and 500 new shade structures across the city.** More than 50% of these will be planted or installed in low-to-moderate income communities and more than 90% will be planted or installed in low, moderate, and medium-income communities.

STRATEGY 1: EDUCATE AND EMPOWER

Phoenicians understand and support the importance and value of trees and shade

Create a citywide movement around shade and heat

1. Launch Shade Phoenix public communications campaign

Create and launch, in consultation with community stakeholders, a citywide communications campaign to engage residents and businesses about the importance of shade and how it can be incorporated into the city, and to maximize awareness of public resources available to support trees and shade. The campaign will create multi-media content for diverse stakeholders, with emphasis on low tree and shade parts of the city. Content will be distributed using all available channels such as social media.

Funding	Inflation Reduction Act (IRA) Urban and Community Forestry program
Lead Department	Office of Heat Response and Mitigation
Partners	Communications, Departmental Public Information Officers

2. Create shade award and recognition opportunities for innovative projects adding shade in Phoenix

Clearly identifiable designation of well-designed shaded spaces will help residents recognize where they can find relief from heat. Award programs that recognize and celebrate innovation will help drive new approaches to shading spaces and promote the importance of shade as a design criterion for outdoor spaces. This effort could include certification for outdoor spaces, annual awards for good shade projects, businesses, municipal workers, and good actors around our community. OHRM will work with partners to establish certification criteria that corresponds to different typologies of outdoor spaces.

Funding	Office of Heat Response and Mitigation General Fund
Lead Department	Office of Heat Response and Mitigation
Partners	Planning and Development, Arizona State Department of Forestry and Fire Management, Parks and Recreation, Street Transportation

3. Commission local artists to design and deploy public art shade installations in public spaces

Public art can be a powerful tool to raise awareness about extreme heat in our city as well as celebrate the identity and history of a neighborhood or community. In 2023, the City of Phoenix was one of 8 U.S. cities selected as a winner of Bloomberg Philanthropies' Public Art Challenge, which invites mayors and artists to submit proposals to receive up to $1 million in funding for innovative public art projects designed to address local challenges. Phoenix's submission, '!Sombra! - The Celebration of Shade', commissioned nine local artists to create shading and cooling installations in neighborhood parks across Phoenix. The temporary structures will be installed in 2025 and be accompanied by community engagement activities and a one-day festival celebrating the city's resilience to heat and the importance of shade in Phoenix.

Funding	Bloomberg Philanthropies' Public Art Challenge
Lead Department	Arts and Culture
Partners	Office of Heat Response and Mitigation, Parks and Recreation, Office of Innovation, Artlink, Arizona State University

4. Develop neighborhood tree plans in partnership with local communities

The City will partner with ASU Rob and Melani Walton Sustainability Solution Service and local organizations to facilitate neighborhood-scale urban forestry planning workshops in 1-2 Phoenix neighborhoods. These workshops will be based on and draw from The Nature Conservancy's 'Urban Heat Leadership Academy' and the *Greater Phoenix Heat Action Planning Guide*. These plans will catalyze additional investments in urban forestry in underserved areas.

Funding	IRA to Arizona State University
Lead Department	Office of Heat Response and Mitigation
Partners	ASU Rob and Melani Walton Sustainability Solution Service and partners

Provide public education around sustainable and equitable shade practices

5. Create and distribute materials for a variety of audiences on natural and built shade

The City will utilize new and existing resources created by public and private partners to engage and activate a variety of audiences to support the goals of expanding and maintaining natural and built shade in Phoenix. Topics may include 'Right Tree, Right Place' and 'Right Shade, Right Place' campaigns, proper tree maintenance practices (e.g. trimming and watering), designs for typical green stormwater infrastructure installations, tree and heat equity, and heat science. All resources will be aligned with the values of this plan and be provided in Spanish and English.

One example of these types of efforts are training and demonstrations on how to properly plant and maintain a tree provided by Parks and Recreation tree experts at volunteer events hosted at City of Phoenix parks. The City has published a new website with resources to provide information and guidance on green stormwater infrastructure – what it is, how it can be designed, and how to navigate permitting and plan review processes. The City will continue to explore other partnership opportunities to educate the public about trees and shade.

Funding	Citywide General Fund and Parks and Recreation Capital Improvement Program
Lead Department	Office of Heat Response and Mitigation
Partners	Street Transportation, Planning and Development, Water, Office of Environmental Programs, Office of Innovation, Parks and Recreation, Communications, Trees Matter, Maricopa County, American Forests, Arizona Sustainability Alliance, U.S. Forest Service, Watershed Management Group

STRATEGY 2: **EXPAND SHADE**

Increase shade for people where they need it most

Increase shade for children

6. Implement Shade for Students program

In 2023, the City launched the Shade for Students grant program to construct built shade at public and private nonprofit schools and nonprofits who use their sites to serve youth. Through this program, schools could apply for up to $75,000 per site to install shade structures. Projects were selected by a panel of internal and external partners and must be located within Qualified Census Tracts or areas highlighted as being disadvantaged in the Federal Climate and Economic Justice Screening Tool. To-date, 47 structures have been funded serving 26 organizations.

Funding	American Rescue Plan Act - ARPA ($1.5M)
Lead Department	Office of Heat Response and Mitigation
Partners	Arts and Culture – Youth and Education, The Design Laboratory

7. Complete implementation of Canopy for Kids program

In 2023, the City utilized $2 million from the Federal American Rescue Plan Act to launch the Canopy for Kids grant program to plant trees at public and private nonprofit schools and nonprofits who use their sites to serve youth. All projects must be located within Qualified Census Tracts or areas highlighted as being disadvantaged by the Department of Housing and Urban Development. If they are not located within these areas, but 80% or more of the students at a school receive free or reduced lunch they can also receive funding.

The first planting through this program took place in March 2024 in west Phoenix, where volunteers and students helped plant 80 drought-tolerant trees at two schools. Five additional schools were planted by the end of the spring planting season and almost 200 trees have been planted since the program began. The ARPA funding will result in over 1,000 trees planted.

Unlike many other tree planting funding sources, this funding can also be spent to install new irrigation systems or adjust old systems to ensure the trees are sufficiently watered. To continue the program beyond this year, the City will allocate an additional $2 million from the Inflation Reduction Act. Schools are encouraged to collaborate with local nonprofits and funding can be used to pay nonprofits to provide educational components and curriculum to the schools to enhance tree knowledge for students.

Funding	ARPA ($2M), IRA ($2M)
Lead Department	Office of Heat Response and Mitigation
Partners	ARPA: various school partners, Youth and Education Department, Arizona Public Service, Trees Matter, AZ Sustainability Alliance, Keep Phoenix Beautiful; IRA: Watershed Management Group, Arizona State University

8. Integrate shade in new construction and renovation at municipal playgrounds

Children are particularly vulnerable to the impacts of extreme heat. Playgrounds can provide outdoor spaces for children and their families to recreate and cool off during hot days. Parks and Recreation will work with designers, engineers, and relevant City departments to review new and substantial renovations for Capital Improvement Projects (CIP) to ensure that shade is provided at playgrounds as feasible and share significant milestones. OHRM will work to identify funding opportunities to increase shading at existing playgrounds.

Funding	Parks Capital Improvement Program
Lead Department	Parks and Recreation
Partners	Street Transportation, Planning and Development, Office of Heat Response and Mitigation, Finance

Increase shade on City-owned properties

9. Plant trees in City parks

Phoenix's City-run parks are home to an urban forest that provides significant benefits to resident's quality of life by improving air quality, stormwater management, energy savings, and shade. The Phoenix Parks and Recreation Department has planted nearly 17,000 trees in city parks since 2010 and manages a large portion of the City's total tree inventory. This work has continued since the 2010 Tree and Shade Master Plan and the City will continue to explore opportunities to partner and build upon this work to enhance and maintain natural shade within parks.

Funding	Parks and Recreation
Lead Department	Parks and Recreation
Partners	Office of Heat Response and Mitigation

10. Expand shade on City-owned property and right-of-way

The City is allocating IRA and other funding sources to accelerate tree planting on public property, including on City-managed landscape maintenance areas in the public right of way along streets. The City has identified neighborhoods in the priority areas that have wide right of way that are good candidates for trees supported with green stormwater infrastructure (GSI, curb cuts and bioswales) to supplement irrigation wherever possible. The IRA funds will also cover water and maintenance of the trees for the establishment period of three years. After three years the trees will become part of the Street Transportation Department landscape maintenance areas and be maintained in perpetuity using City funds.

City staff will work to more broadly assess needs for shade on City-owned property (e.g., by using satellite imagery, conducting walking audits of parks) and identify additional sources of funding to add shade and cover other critical installation and maintenance costs including irrigation, archeological surveying and preservation, and utility deconfliction. Relevant departments will help to review all planning, renovation, and construction projects to maximize opportunity for shade and GSI, especially in areas covered by the Walkable Urban Code. Funding for public property projects will support tree planting and built shade at selected City-owned facilities in priority areas where there are unique opportunities to make a transformative impact that fall outside the scope of regular operating budgets.

Funding	IRA ($1.35M), GO Bond (portion of $7.7M)
Lead Department	Street Transportation, Office of Heat Response and Mitigation
Partners	Aviation, Convention Center, Fire, Housing, Human Services, Library, Parks and Recreation, Police, Public Transit, Public Works, Water, Office of Environmental Programs

11. Pilot a Public Shade Fund

Several property types and developments are required by City code to include trees. The City is exploring the creation of a Public Shade Fund that can be used in instances where these projects cannot include the required number of trees. OHRM will work with other Departments to design and launch a pilot fund and ensure that in lieu funds are used in proximate impact areas.

Funding	Private developers
Lead Department	Planning and Development
Partners	Private developers, Office of Heat Response and Mitigation

Increase shade on public right-of-way

12. Expand Cool Corridors network

In 2022, Phoenix's Street Transportation Department launched the Cool Corridors program to plant trees in targeted transportation corridors to keep pedestrians, bicyclists and transit users safe and provide relief from high temperatures. Corridors were envisioned as one-quarter to half-mile walkways or trails adjacent to an arterial street and were selected using four key criteria: neighborhood heat vulnerability, transit dependency, pedestrian use, and shade coverage and temperature. Cool Corridors can also include engineered shade and other design features and amenities to promote thermal safety and comfort, and should be implemented through a combination of public and private partnerships and resources.

The added focus on equity in the Shade Phoenix Plan requires a reconsideration of the goals and investment plan for the Cool Corridor program, which originally called for 1,800 trees to be planted per year. The focus of the program will continue to be to increase shade coverage on highly used walking routes in communities disproportionately impacted by summer heat. However, construction and maintenance of successful Cool Corridor projects in the places with the greatest need requires a more comprehensive implementation strategy with higher per-unit costs. OHRM will work with Streets to identify additional critical community destinations, such as schools and community centers, in priority areas to be incorporated into the program. The City will also work with community and private property owners to understand how people walk to and want to walk to priority destinations and focus investments on those preferred routes. The Cool Corridor program will focus on construction and maintenance of exemplar projects in priority communities that comprehensively address infrastructure deficiencies and conflicts to provide robust shade. When feasible, Cool Corridor investments will align with major construction and capital improvement programs to maximize impact and efficiency.

Funding	General Fund ($1.4M)
Lead Department	Office of Heat Response and Mitigation
Partners	Street Transportation, Parks and Recreation, Office of Innovation

13. Add shade structures at bus stops

Phoenix has 4,080 designated public bus stops supporting 15.6 million annual riders. Approximately 75%, or 3,054, have shelters, which can provide some shade and thermal relief for riders. 1,869 of these have been added since the 2010 Tree and Shade Master Plan was released, representing an investment of more than $18 million in new and replacement bus shelters. Stops were prioritized based on ridership to maximize program impact.

The Public Transit Department will install at least 80 shade structures at bus stops each year as it works to ensure there are shade structures at all public bus stops in the City of Phoenix within the next 10 years. The City currently estimates that it will be able to provide bus shelters at most stops with the exception of 300 that were determined to have infrastructural limitations including the need for right-of-way, streets projects, or historic area protections. As part of this effort, the Public Transit Department will continue to explore innovative design strategies to maximize shade provision at bus stops.

Funding	T2050, General Fund
Lead Department	Public Transit
Partners	Street Transportation, Office of Heat Response and Mitigation

14. Construct Phoenix Sidewalk Shade installations in high-traffic public right-of-way

Providing shade for pedestrian and bicycle riders can improve public health and the economic vitality of communities. The City will construct 25 built shade structures to provide shade for heavily-trafficked public rights of way, with input from local artists on the designs from the Innovate PHX Challenge. The ideas include shaded bike lanes, artistic concepts, and direction shade with around 170 participants contributing to the challenge. Construction is expected to begin in 2025 and conclude in 2026. Locations were selected based on bicycle and pedestrian volumes and other variables, such as heat vulnerability index, surface temperature, and access to vehicles. Due to funding requirements, all of the locations are in or near Qualified Census Tracts. To date, 3-4 standard designs have been developed for use in this work.

Funding	ARPA ($3M)
Lead Department	Street Transportation
Partners	Office of Heat Response and Mitigation, Office of Innovation

15. Pilot a shade structure right-of-way revocable permit

Currently, if a property owner wants to construct a shade structure in the public right-of-way within the Downtown area and areas covered by the Walkable Urban Code, they must obtain a revocable permit. This revocability, and the lack of permanence, can discourage property owners from making investments in shade in the public right of way. Models exist in other cities for tiers of revocable permits, where 'revocability' is limited based upon the type of structure and permit. The City will explore the feasibility of piloting a citywide permit for shade structures, canopies, and building overhangs, that would limit the City's revocability. This may require changes to City ordinance and/or variances to be obtained to allow for revocable permits outside high density urban development.

Funding	n/a
Lead Department	Planning and Development
Partners	Office of Heat Response and Mitigation, Street Transportation

Increase shade on private properties

16. Execute Community Canopy Grant Program

Launched in 2023, the Community Canopy Grant program aims to improve tree canopy coverage in Qualifying Census Tracts (as defined by the U.S. Department of Housing and Urban Development) throughout Phoenix. Through this program, neighborhood associations, community nonprofits, multi-family residential sites, and individual community members can submit applications requesting trees, supplies and support for tree planting projects designed to assist communities in increasing their tree canopies.

To date, approximately 800 trees have been planted through this program on approximately 400 residential properties. The goal for the Fall 2024 planting season is to plant an additional 1,500 trees. A portion of the IRA funding will be allocated to extend this program and allow more residents to benefit. The goal for the IRA funding is to plant 6,000 trees over the next five years

Funding	ARPA ($2M), IRA ($2.5M)
Lead Department	Office of Heat Response and Mitigation
Partners	Neighborhood Services, Nature Conservancy, CHISPA AZ, West Coast Arborists, Dusty Landscaping, Treeland Nurseries, Whitfill Nursery, Desert Tree Farm

17. Develop a permit for small tree planting projects

Planting a tree on a private multi-family residential or non-residential property in the City of Phoenix requires a permit from the Planning and Development Department. Replacements of pre-existing permitted trees do not require a new permit, but must adhere to similar tree species and size standards. This process takes a minimum of three months, which can be a burden for small tree planting projects.

To help support small tree planting projects, the City is exploring options for a streamlined permitting and approvals process. OHRM is working with the Planning and Development Department to develop simpler processes for projects that would plant 1-5 trees.

Funding	n/a
Lead Department	Office of Heat Response and Mitigation
Partners	Planning and Development

18. Develop sample shade stipulations for Village Planning Committees and Planning Commission

Phoenix is divided into 15 urban Villages, each with a Village Planning Committee (VPC) appointed by the Mayor and City Council. The VPCs provide guidance on a range of citywide and local issues, and they hear and discuss re-zoning cases, general plan amendments, and text amendments and provide recommendations to the Planning Commission.

One tool utilized by the VPCs are stipulations, which can take the form of legal, enforceable rezoning stipulations drafted together with the village planners. Planning and OHRM will work together to refine existing and develop new sample stipulations for use by Village Planning Committees and the Planning Commission to support the goals of this plan and expand shade.

Funding	n/a
Lead Department	Planning and Development
Partners	Office of Heat Response and Mitigation

STRATEGY 3: **PRESERVE AND MAINTAIN EXISTING SHADE**

The community works together to support a thriving urban forest and well-maintained built shade

Care for and maintain trees and shade structures on public property

19. Implement street tree placement program using 'right tree, right place' and 'no-net-loss' approaches

Expand the Tree Replacement Program to include all departments that manage City property. New species will be chosen using recommendations from the species list developed by Phoenix Metro Urban Tree Roundtable and to comply with all regulatory requirements with the Phoenix Active Management Area as defined by the Arizona Department of Water Resources.

Funding	~$390k funding allocated in Street Maintenance Operation budget
Lead Department	Street Transportation
Partners	Office of Heat Response and Mitigation, Landscape maintenance contractors

20. Work with Salt River Project and Arizona Public Service on tree replacements due to utility conflicts

When there is a utility conflict on city-managed property that requires tree removal, SRP will identify, remove at their cost and provide three replacement trees in no conflict areas at their expense (APS provides a 1:1 ratio of replacement trees). OHRM will work with SRP and APS to identify removal needs and new planting sites, using the 'right tree, right place' approach.

Funding	Salt River Project and Arizona Public Service
Lead Department	Street Transportation, Parks and Recreation
Partners	Office of Heat Response and Mitigation, Finance, Landscape maintenance contractors

21. Utilize GSI to reduce potable watering needs for trees and other vegetation

GSI can support vegetation while providing many co-benefits, including heat reduction, stormwater improvements, reductions in localized flooding, and reductions in potable water irrigation needs. The City will find opportunities to use GSI in capital improvement projects and in landscape improvement projects on existing city property and right-of-way. For private development projects, the City will inform and encourage the use of GSI, including the use of stipulations for re-zoning requests, as appropriate.

Funding	Capital Improvement Projects, maintenance budgets
Lead Department	Street Transportation – Office of City Engineer, Planning and Development
Partners	Planning and Development, GSI Working Group, Office of Environmental Programs, Office of Heat Response and Mitigation, Finance, private contractors

22. Maintain City-managed trees and shade structures

Caring for and maintaining the City's existing tree canopy is critical to ensuring a healthy and thriving city. The City will continue to perform regular maintenance work, including trimming, pruning, and removal of dead limbs and seek additional resources as available to expand this vital work.

The City will also work to ensure that shade structures remain in good working condition. Routine maintenance will include actions such as: graffiti removal, tightening bolts, and re-attaching and repairing shade sails. As the number and types of shade structures in the city increases, the City will evaluate its maintenance practices and identify any necessary changes and best management practices, including enhance existing structures with new technologies to mitigate heat.

Funding	General Fund, $3.5M in 2023 (Parks and Recreation + private contracts)
Lead Department	Parks and Recreation
Partners	Street Transportation, Office of Heat Response and Mitigation

23. Improve management of trees in the public right-of-way

Budget and Research will analyze the City's current landscape maintenance efforts, compare to peer city best practices and identify potential areas of improvement. This could include enhancements to contract management, oversight of challenges with vendors, departmental responsibilities, balanced insourced versus outsourced tasks, and how landscape maintenance ties into water resource management and heat mitigation efforts.

Funding	n/a
Lead Department	Budget and Research
Partners	Office of Heat Response and Mitigation, Street Transportation, Parks and Recreation

Strengthen code enforcement on private property

24. Strengthen enforcement of tree code

The City will review and update its codes as necessary and strengthen mechanisms for tree and plant violation enforcement on private property. This includes exploring the designation of a site inspector as a dedicated tree and plant violation inspector. OHRM will work with NSD to determine which properties are eligible for increased enforcement.

The City will explore more proactive identification of at-risk properties, including possible development of screenings to identify properties that are out of compliance with enforceable site plans.

Funding	N/A
Lead Department	Neighborhood Services
Partners	Office of Heat Response and Mitigation, Planning and Development

Increase City capacity to maintain trees and shade

25. Increase the number of Certified Arborists within the City and expand training opportunities for staff

Caring for and maintaining trees requires specific knowledge and expertise. To enhance and expand capacity to care for the City's tree canopy, the City will seek to increase the number of certified arborists on staff and provide continuing education for currently certified arborists. The City partners with the Arizona Community Tree Council to offer space in Parks and Recreation facilities to host Certified Arborist Training and Review courses. These courses are designed to prepare tree care industry workers for the International Society of Arboriculture (ISA) Certified Arborist Exam, the industry standard certification. The City will continue to explore other training opportunities to expand staff expertise and capacity related to both trees and built shade.

Funding	Varies by department
Lead Department	Parks and Recreation
Partners	Office of Heat Response and Mitigation, Street Transportation

STRATEGY 4: **EVALUATE AND INSTITUTIONALIZE**

Ongoing implementation and improvement of shade efforts to scale their impacts and maximize benefits

Monitor and evaluate progress on Shade Phoenix plan

26. Complete citywide tree and shade assessments

The City will assess both tree canopy and shade coverage to better understand the existing coverages and identify opportunities for expansion and areas of greatest need. While many cities have conducted tree assessments, few have assessed shade. The City will conduct a citywide assessment of where shade exists at different times of day and different times of the year. This first-of-its kind assessment for Phoenix will use 3D building and landscape data, run through a model with sun analysis. OHRM will work with experts at UCLA and ASU to create a best management reporting practice for the built shade components of this assessment. For tree assessment, the City will use Light Detection and Ranging (LiDAR) data to assess progress on expanding the tree canopy and identify areas of need.

Funding	N/A
Lead Department	Office of Heat Response and Mitigation
Partners	University of California Los Angeles (UCLA) and Arizona State University (ASU)

27. Conduct and maintain an inventory of trees and shade structures on city property

To help complement the shade assessment and to identify opportunities for new shade structures in areas of high need, the City will conduct a citywide inventory of shade structures on publicly-managed property. This will include, but not be limited to, bus shelters and park spaces. For trees, the City will complete a citywide inventory of trees on publicly managed property, using asset management software. Once completed, the tree inventory will be managed by the Office of Heat Response and Mitigation in coordination with all relevant City departments.

Funding	Parks and Recreation (tree inventory), N/A (shade structure inventory)
Lead Department	Office of Heat Response and Mitigation
Partners	Parks and Recreation, Street Transportation

28. Provide an annual progress report on Shade Phoenix

Shade Phoenix outlines actions the City and its partners will take over the next five years. To track progress toward our goals, OHRM will produce an annual report tracking the City's progress on each of the actions in the Plan. This public-facing document will ensure our efforts are transparent and stakeholders can hold the City accountable for implementation.

Funding	General Fund
Lead Department	Office of Heat Response and Mitigation
Partners	Arizona State University (ASU), University of California Los Angeles (UCLA)

29. Update the Shade Phoenix Plan every 5 years

Achieving the City's long-term goals and expanding and maintaining shade in Phoenix will take time and continued effort and investments. The City and its partners will also continue to learn about the most effective ways to deliver this work and better understand the unique needs of Phoenix's diverse communities as it implements Shade Phoenix. To ensure that Phoenix's shade efforts remain current and focused on the city's most pressing needs, OHRM will work with all of the City departments and partners to update Shade Phoenix every 5 years.

Funding	n/a
Lead Department	Office of Heat Response and Mitigation
Partners	Mayor's Office, City Manager's Office

Strengthen organizational coordination and staff capacity

30. Build institutional capacity for green stormwater infrastructure

The city is working to expand the use of green stormwater infrastructure across the city. A new cross-departmental working group on GSI serves as a resource to City departments and forum for learning. The City will identify opportunities to provide specific training to city project managers on incorporating GSI into design, construction, and maintenance practices. The City will include GSI expertise in future engineering on-call contract requests for proposals. Staff capacity is an ongoing concern so the City will also explore opportunities to fund a new position to lead and coordinate work on GSI across City departments. Private property owners and developers are critical in expanding the use of GSI. With this in mind, the City will provide educational resources for private parties to feel informed about implementing GSI on their property/development, including resources on the City's GSI website. The City will also investigate opportunities to streamline permitting processes and expand resident and professional familiarity with GSI installation and maintenance.

Funding	n/a
Lead Department	Planning and Development
Partners	Office of Heat Response and Mitigation, Office of Environmental Programs, Street Transportation, Parks and Recreation

31. Re-establish cross-departmental working group on urban forestry and establish a new built shade working group

Implementation of this Plan requires a whole of government approach and coordination across a number of City departments and offices. It also depends upon a whole community-driven approach and coordination between the City and community members and partners. To better align City staff across Departments, the City has re-established a cross-departmental working group on urban forestry comprised of all Departments that manage trees on their properties. For the newer approaches to built and engineered shade, the City will establish a new working group to coordinate this work across Departments. These working groups will also help to align City Departments in their engagement with community stakeholders and external partners.

Funding	n/a
Lead Department	Office of Heat Response and Mitigation
Partners	Aviation, Convention Center, Fire, Housing, Human Services, Library, Parks and Recreation, Police, Public Transit, Public Works, Street Transportation, Water

Strengthen regulations, design standards and guidelines

32. Update City of Phoenix plant species guidance

Planting the right tree in the right place is critically important to expanding natural shade in Phoenix. The desert setting requires special attention to detail when selecting which tree species may thrive into the future. Trees mature over a long time horizon, during which our local climate will continue to change, and we are thinking ahead to which trees will be best adapted to local conditions. OHRM will continue to work with Planning and other City Departments to evaluate species guidance and regulatory plant lists against the tree list developed by the Urban Forestry Roundtable. The City will explore any necessary updates to codes on species requirements and guidance.

Funding	n/a
Lead Department	Planning and Development
Partners	Office of Heat Response and Mitigation, Office of Environmental Programs, Parks and Recreation

33. Embed shade recommendations into City-owned building design standards and facility review

The City is updating its standards for new City building construction projects and substantial renovations to shape the General Obligation Bond-funded projects. In addition, to ensure these standards are followed consistently, the City re-established the Facility Review Committee. The Committee will provide recommendations on all new construction and substantial renovation projects for compliance with the new building standards. OHRM provided recommendations for the building standards related to shade and will serve on the Facility Review Committee to ensure alignment with the vision and goals of this Plan.

Funding	n/a
Lead Department	Public Works
Partners	Office of Heat Response and Mitigation, City Engineer

34. Integrate tree and shade goals in all relevant City plans

The City has several plans to guide efforts to ensure Phoenix becomes the most sustainable desert city on the planet. This includes documents and planning processes like the General Plan – PlanPHX 2025, as well as topic-specific plans like the Climate Action Plan, and Departmental strategies such as the Parks and Recreation Master Plan. OHRM will work with colleagues across the City to ensure that all plans and planning processes are aligned with the vision and goals presented in this Plan.

Funding	n/a
Lead Department	Office of Heat Response and Mitigation
Partners	Parks and Recreation, Planning and Development, Office of Environmental Programs

Create and expand pathways for careers in urban forestry

35. Create a Tree Steward Program

The City recognizes the importance of planting trees in high need areas, but also considers educating the public on how to plant and care for trees just as critical. With funding from the IRA, the City will partner with a community organization focused on workforce development to hire and train 10 community members as Community Tree Stewards. The Tree Stewards will work in conjunction with the City to organize and lead neighborhood tree plantings, inventory and monitor neighborhood trees, coordinate tree maintenance, and help educate and inspire other residents about the importance and value of trees.

OHRM has been working with the Arizona Department of Forestry and Fire Management on the development of a training manual to train community members. Community Tree Stewards will be trained in the following subjects: tree biology, soil, water and fertilizer, tree identification, tree selection and planting, tree maintenance and on-going care, biotic and abiotic tree threats, and the benefits of trees and environmental justice.

Funding	IRA ($2M)
Lead Department	Office of Heat Response and Mitigation
Partners	Parks and Recreation, Community-based organizations, Arizona State Department of Forestry and Fire Management

36. Support youth workforce development for urban forestry career pathways

An ASU team is working with state apprenticeship offices, local and national urban forestry industry leaders, professional organizations, and community colleges to document and design urban forestry workforce and entrepreneurial pathways with a focus on addressing barriers to access and points of disconnection. With funding from the IRA, the ASU team will create an urban forestry vocational program that includes experiential courses, internships and apprenticeships. The aim is to create pre-professional on-ramps for underserved CEJST communities, with a focus on opportunity youth (ages 16–24). The City will support this project by exploring opportunities to pilot contracting and hiring of program participants.

Funding	IRA via Arizona State University
Lead Department	Office of Heat Response and Mitigation
Partners	Arizona State University, Arizona Conservation Corps, Arizona Landscape Contractors Association, Bartlett Tree Experts, Arizona Community Tree Council, Arizona Nursery Association, Arizona Cooperative Initiative

37. Provide Certified Arborist Training for residents and professionals

Proper tree care and maintenance requires specialized knowledge and expertise. The City partners with the Arizona Community Tree Council to offer space in Parks and Recreation facilities to host Certified Arborist Training and Review courses. These courses are designed to prepare tree care industry workers for the International Society of Arboriculture (ISA) Certified Arborist Exam, the industry standard certification. The City will work with partners to promote this course, as well as other training opportunities, to a wide audience to expand the trained workforce to help care for trees in the city.

Funding	N/A
Lead Department	Parks and Recreation, Office of Heat Response and Mitigation
Partners	Arizona Community Tree Council

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APPENDIX

Implementation Status of Actions from 2010 *Tree and Shade Master Plan*

Raise awareness about the condition and benefits of the urban forest by educating staff and the public. Build demonstration projects. Establish partnerships that promote stewardship and investment in trees.		
A.1.	Create a council-approved Citizen Tree and Shade Committee to oversee Urban Forest issues.	Completed
A.2	Provide information to the public about on-going efforts and long-term strategies.	Ongoing
A.3	Develop and Establish Education and Outreach Programs	Ongoing
A.4	Create Channel 11 Programs, Streaming Web Videos and DVDs	Redirected[1]
A.5	Hold Urban Forest and Shade Symposium	Redirected[2]
A.6	Develop Shade and Urban Forest Excellence Award	Incomplete
A.7	Research grant opportunities	Ongoing
A.8	Establish and Maintain Partnerships	Ongoing
A.9	Develop and Complete Shade Demonstration Projects	Ongoing
Preserve, protect and increase the quality and quantity of trees and vegetation, especially large shade trees in appropriate areas.		
B.1	Conduct a baseline tree inventory that will assess canopy coverage for the entire city	In process[3]
B.2	Develop a Tree and Shade Management Plan	Incomplete
B.3	Research and develop additional sources of revenue for the care and maintaince of our urban forest	Ongoing
B.4	Incrementally restore budget for street trees, landscape and park maintenance as well as community tree outreach programs.	Ongoing
B.5	Establish Best Management Practices (BMP) based upon national arboriculture specifications, and adopt them into the Parks and Recreation Department's Field Operation Procedures.	Completed[4]
B.6	Establish an Urban Forest Infrastructure Team to oversee implementation of the Master Plan	Completed
B.7	Update Tree and Shade Master Plan biannually to ensure action items are being completed.	Incomplete
Treat the urban forest as infrastructure to ensure that trees and engineered shade are an integral part of the city's planning and development process		
C.1	Integrate goals of the Tree and Shade Master Plan into the General Plan	Completed
C.2	Develop and establish a comprehensive tree, shade and landscape ordinance	Incomplete
C.3	Further develop a green waste program, and look for ways to improve efficiencies	Ongoing
C.4	Research and complete shade demonstration projects	Ongoing

[1] Focus has shifted away from videos to broader online materials

[2] PDD held an Urban Tree workshop as part of the ReinventPHX initiative and an annual Shade Conference is now hosted by regional partners.

[3] A tree inventory was conducted in 2014 of City of Phoenix owned property

[4] The Parks and Recreation Department has adopted the American Natioanl Standards Institute Tree Care standards for field operations.

Completed: Action was completed

In process: Action is in process of being completed

Ongoing: Action does not have a finite milestone or state of completion and represents ongoing activities

Redirected: Action was redirected to other activities, reflecting a change in focus or understanding of need

Incomplete: Action has a finite milestone that has not been completed

Shade Phoenix Plan - Implementation Table

Action	#	Sub-Action	Lead	Partners	Funding
STRATEGY 1: **EDUCATE AND EMPOWER** - All Phoenicians understand the importance and value of trees and shade					
Create a citywide movement arround shade and heat	1	Launch Shade Phoenix public communications campaign	OHRM	Communications, Departmental PIOs	IRA
	2	Create shade award and recognition opportunities for innovative projects adding shade in Phoenix	OHRM	PDD, AZ DFFM, PRD, STD	OHRM General Fund
	3	Commission local artists to design and deploy public art shade installations in public spaces	Arts	OHRM, PRD, Innovation, Artlink, ASU	Bloomberg Philanthropies
	4	Develop neighborhood tree plans in partnership with local communities	OHRM	ASU	IRA (ASU)
Provide public education around sustainable and equitable shade practices	5	Create and distribute materials for a variety of audiences on natural and built shade	OHRM	STD, PDD, WSD, OEP, Innovation, PRD, Communications, Trees Matter, Maricopa County, American Forests, AZ Sustainability Alliance, U.S.F.S., Watershed Mgmt. Group	Citywide General Fund and Parks and Recreation CIP
STRATEGY 2: **EXPAND SHADE** - Increase shade for people outdoors where they need it most					
Increase shade for children	6	Implement Shade for Students program	OHRM	YED, The Design Laboratory	ARPA ($1.5M)
	7	Complete implementation of Canopy for Kids program	OHRM	ARPA: various school partners, YED, APS, Trees Matter, AZSA, KPB; IRA: Watershed Mgmt. Group, ASU	ARPA ($2M), IRA ($2M)
	8	Integrate shade in new construction and renovation at municipal playgrounds	PRD	OHRM, Finance, STD, PDD	Parks Capital Improvement Program
Increase shade on City-owned properties	9	Plant trees in City parks	PRD	OHRM	PRD
	10	Expand shade on City-owned property and right-of-way	STD/ OHRM	Aviation, Convention, Fire, Housing, HSD, Library, OEP, PRD, Police, PT, PWD, WSD	IRA ($1.35M), GO Bond ($7.7M)
	11	Pilot a Shade Mitigation Fund	PDD	Private developers, OHRM	Private developers
Increase shade on public right-of-way	12	Expand Cool Corridors network	OHRM	STD, PRD, Innovation	General Fund ($1.4M)
	13	Provide shade structures at all bus stops	PT	STD, OHRM	T2050, General Fund
	14	Construct Phoenix Sidewalk Shade insallations in high-traffic public right-of-way	STD	OHRM, Innovation	ARPA ($3M)
	15	Pilot a shade structure right-of-way revocable permit	PDD	OHRM, STD	n/a
Increase shade on private properties	16	Execute Community Canopy Grant Program	OHRM	NSD, The Nature Conservancy, CHISPA AZ, West Coast Arborist, Dusty Landscaping, Treeland Nurseries, Whitfill Nursery, Desert Tree Farm	ARPA ($2M), IRA ($2.5M)
	17	Develop a permit for small tree planting projects	OHRM	PDD	n/a
	18	Develop sample shade stipulations for Village Planning Committees and Planning Commission	PDD	OHRM	n/a
STRATEGY 3: **PRESERVE AND MAINTAIN EXISTING SHADE** - The community works together to support a thriving urban forest and well-maintained built shade					
Care for and maintain trees and shade structures on public property	19	Implement street tree replacement program using 'right tree, right place' and 'no-net-loss' approaches	STD	OHRM, Landscape maintenance contractors	Street Maintenance Operations
	20	Work with Salt River Project and Arizona Public Service on tree replacements due to utility conflicts	STD/PRD	OHRM, Finance, Landscape maintenance contractors, SRP, APS	SRP and APS
	21	Utilize GSI to reduce potable watering needs for trees and other vegetation	STD/PDD	GSI Working Group, OEP, OHRM, Finance, private contractors	CIP, maintenance budgets
	22	Maintain City-managed trees and shade structures	PRD	STD, OHRM	General Fund ($3.5M in 2023)
	23	Improve management of trees in the public right-of-way	Budget	OHRM, STD, PRD	n/a
Strengthen code enforcement on private property	24	Stengthen enforcement of tree code	NSD	OHRM, PDD	n/a
Increase City capacity to maintain trees and shade	25	Increase the number of Certified Arborists within the City and expand training opportunities for staff	PRD	OHRM, STD	varies by department
STRATEGY 4: **EVALUATE AND INSTITUTIONALIZE** - Ongoing implementation and improvement of shade efforts to scale their impacts and maximize benefits					
Monitor and evaluate progress on Shade Phoenix Plan	26	Complete citywide tree and shade assessments	OHRM	UCLA, ASU	n/a
	27	Conduct and maintain an inventory of trees and shade structures on city property	OHRM	PRD, STD	Parks and Recreation (tree inventory), n/a (shade inventory)
	28	Provide an annual progress report on Shade Phoenix	OHRM	ASU, UCLA	General Fund
	29	Update the Shade Phoenix Plan every 5 years	OHRM	Mayor's Office, City Manager's Office	n/a
Strengthen organizational coordination and staff capacity	30	Build institutional capacity for green stormwater infrastructure	PDD	OHRM, OEP, STD, PRD	n/a
	31	Re-establish cross-departmental working group on urban forestry and establish a new built shade working group	OHRM	Aviation, Convention, Fire, Housing, HSD, Library, PRD, Police, PTD, PWD, WSD	n/a
Strengthen regulations, design standards and guidelines	32	Update City of Phoenix plant species guidance	PDD	OHRM, OEP, PRD	n/a
	33	Embed shade recommendations into City-owned building design standards and facility review	PWD	OHRM, City Engineer	n/a
	34	Integrate tree and shade goals in all relevant City plans	OHRM	PRD, PDD, OEP	n/a
Create and expand pathways for careers in urban forestry	35	Create a Tree Steward Program	OHRM	PRD, CBOs, AZ DFFM	IRA ($2M)
	36	Support youth workforce development for urban forestry career pathways	OHRM	ASU, AZ Conservation Corps, AZ Landscape Contractors Association, Bartlett Tree Experts, AZ Community Tree Council, AZ Nursery Association, AZ Cooperative Initiative	IRA (ASU)
	37	Provide Certified Arborist training for residents and professionals	PRD, OHRM	AZ Community Tree Council	n/a