



City of Phoenix

2024

CLIMATE ACTION PLAN PROGRESS REPORT



“Phoenix is on the frontlines of climate change, which is why we’re working day-in and day-out to develop new strategies to cut emissions, build resilient infrastructure, and importantly, empower residents to take climate action, too.”

- Mayor Kate Gallego



TABLE OF CONTENTS

Why Do We Need a Climate Action Plan Progress Report?	4
Key Climate Achievements In Phoenix (CA)	7
CDP Reporting	8
Phoenix Greenhouse Gas Emission Trends	8
Greenhouse Gas Emission Reduction And Resiliency Goal Areas	10
Key Actions Taken Since 2021	11
Emission Reductions (ER)	13
Stationary Energy Sector (SES)	15
Transportation Sector (TS)	21
Waste as a Resource (WR)	29
Resiliency (R)	35
Air Quality (AQ)	37
Local Food Systems (LFS)	41
Heat (H)	45
Water (W)	53
Acknowledgements	59

WHY DO WE NEED A CLIMATE ACTION PLAN PROGRESS REPORT?

Climate change is a growing global challenge, and Phoenix is no exception. In Phoenix, new records were set in 2023, with 31 straight days of daytime temperature above 110° Fahrenheit. 2023 had one of the driest monsoon seasons, with only 0.15 inches of rain recorded at Phoenix Sky Harbor International Airport. Such climate challenges require local action from the Phoenix community and the City to reduce greenhouse gas (GHG) emissions and increase resiliency. The Phoenix City Council adopted the Phoenix Climate Action Plan (CAP) in October of 2021, setting the path for Phoenix to reduce GHG emissions and adopt resilience strategies for climate impacts.



**“For Phoenix,
our net-zero goal is
community-wide, not
just for City operations.
It will take a cross-sector
approach, overlaid by
a comprehensive plan
that includes water
conservation and heat
mitigation strategies.”**

- Mayor Kate Gallego

This progress report provides an overview of climate actions by the community and City and a summary of climate change progress since the 2021 CAP was adopted. This is particularly important given the many changes that have occurred in Phoenix, including:

- New partnerships within Phoenix communities that leverage knowledge, resources, and expertise to mitigate and adapt to climate change.
- Phoenix was designated as an 'A' list City by CDP, formerly known as the Carbon Disclosure Project, in 2022 and 2023 for leading on climate and environmental issues.
- New information became available, including the 2020 and 2022 community-wide and government operations GHG emission inventories.
- Establishment of the Office of Heat Response and Mitigation, Office of Homelessness Solutions, Office of Innovation, Office of Water Resources Management, and Office of Public Health.
- New and expanded funding opportunities that have accelerated programs and services.
- Activation of the Lower Colorado River Basin Drought Management Plan and the City of Phoenix Drought Management Plan.
- New reporting tools such as the Environment, Social and Governance (ESG) dashboard to provide an easy way for community members, bond rating agencies, and City staff to track progress on City goals.





KEY CLIMATE ACHIEVEMENTS IN PHOENIX

- CDP Reporting
- Phoenix Greenhouse Gas Emission Trends

CDP REPORTING

CDP is a global leader in city reporting on climate and environment, providing an accountability framework. In 2022, Phoenix made the A-list for climate and environmental efforts and retained the A-List rating in 2023. CDP assesses these risks to help cities better prepare for the impacts of climate change.

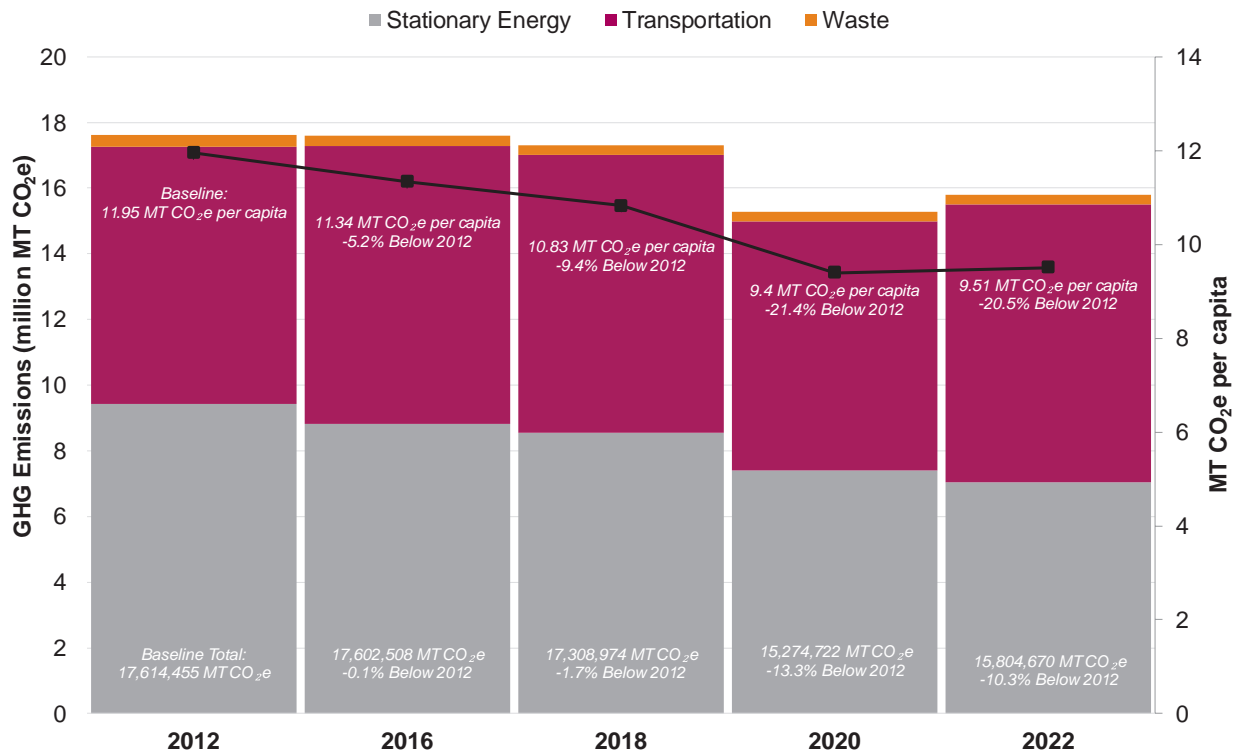
“As we adapt to a warming world, it is essential that we continue working to reduce emissions, big and small,” Mayor Gallego said. “We are proud that CDP has validated our work and pledge to continue our mission to become the most sustainable desert city in the world.”

PHOENIX GREENHOUSE GAS EMISSION TRENDS

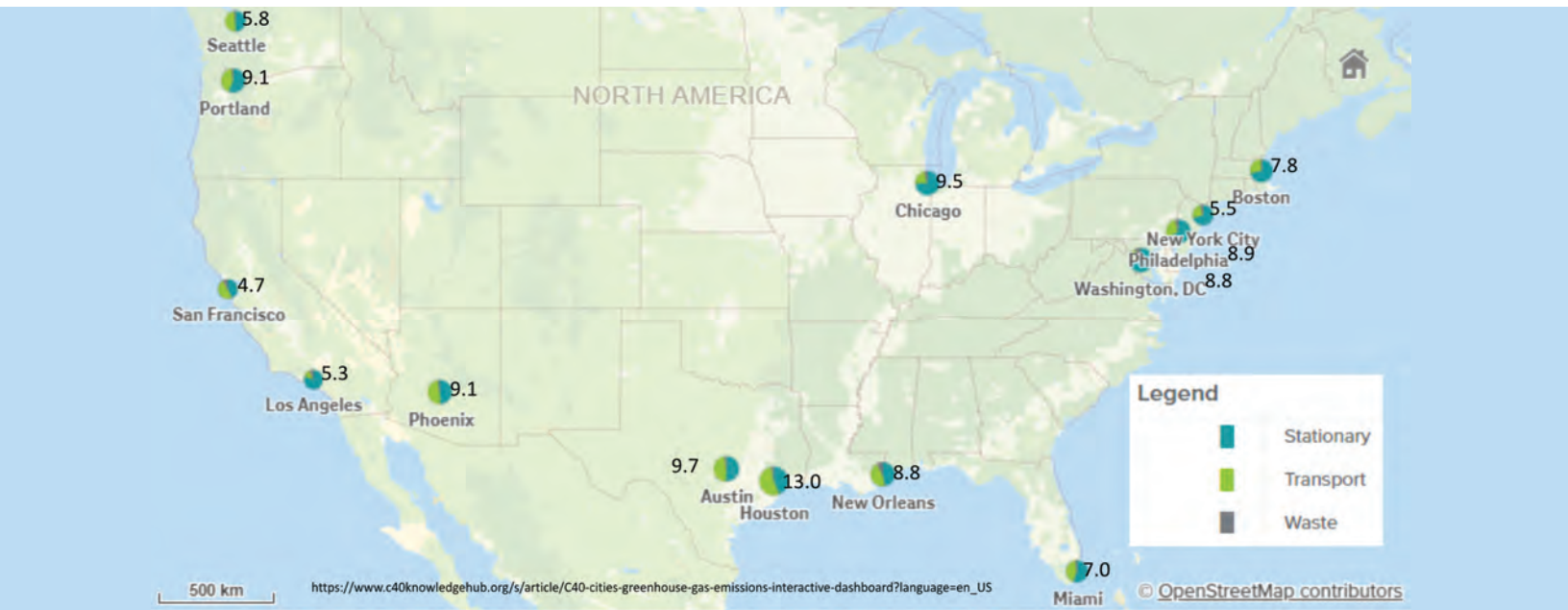
Phoenix conducts government operations and community-scale GHG inventories every two years. The 2022 Greenhouse Gas Emissions Inventory for Government Operations demonstrated continued reductions in GHG emissions across all inventory years and is 29% below 2005 levels. These reductions were accomplished through energy efficiency upgrades, incorporation of alternative fuels, upgrades to landfill gas capture systems, and a reduction in the GHG intensity of the regional electricity grid. The Community-Scale Greenhouse Gas Emissions Inventory had been decreasing since 2012, the first community-scale GHG emissions inventory, but increased slightly from 2020 to 2022. This was due to increasing GHG emissions related to transportation, partly due to a rebound in 2022 from reduced commuting and air travel during the COVID-19 pandemic in 2020. The community-scale GHG emissions also saw reduced GHG emissions from the reduction in the GHG intensity of the regional electricity grid. The 2022 community-scale GHG emissions were 10.3% lower than 2012 levels, decreasing from 17.6 to 15.8 million metric tons of CO₂ equivalent (MT CO₂e), as shown in Figure 1. GHG emissions reductions were achieved from 2012 to 2022, while the City’s population grew 12.8% and the metro area economy grew 54%. Phoenix per capita GHG emissions have decreased 20.5% since 2012 from 11.95 MT CO₂e to 9.51 MT CO₂e in 2022.

Figure 2 shows a map of major US C40 cities and their per capita emissions, including Phoenix. Although there has been steady progress in reducing Phoenix’s per capita GHG emissions, they are still higher than other per capita rates in comparable cities by population size. Cities like San Francisco or New York are much denser, meaning there are more people per square mile, while Phoenix is much less dense. The greater per capita GHG emissions in Phoenix are primarily related to personal transportation. People in higher-density cities with more public transit options tend to drive less in personal vehicles than in cities that are more spread out and have fewer public transit options.

- Figure 1: GHG community emissions by sector for 2012, 2016, 2018, 2020, and 2022.



- Figure 2: Per capita annual GHG emissions (tCO₂e), C40 cities (US) August 15, 2023.



GREENHOUSE GAS EMISSION REDUCTION AND RESILIENCY GOAL AREAS

Phoenix identified seven goal areas in the 2021 Climate Action Plan for focused action: three for emission reductions and four are for increasing resilience.

The emission reduction goal areas include: stationary energy, transportation, and waste, which are covered by the GHG inventories.

- 1.** Stationary Energy refers to the direct generation of electricity or energy used in homes, businesses, and industrial settings that is not used for transportation. Stationary energy sources include fuels like coal, distillate oil, or natural gas and renewable and zero-carbon energy like solar, hydro, wind, or nuclear.
- 2.** Transportation systems that move people and products, including planes, trains, non-road vehicles, trucks, and automobiles, rely on various power sources such as gasoline, diesel, compressed natural gas, jet fuel, and more sustainable fuels like electricity, renewable natural gas, and biodiesel.
- 3.** Waste refers to emissions from the breakdown of discarded materials, including gases generated from wastewater treatment, landfills, and composting.

The four goal areas for increased resiliency include: air quality, local food systems, heat, and water.

- 1.** Air quality actions seek to meet the US Environmental Protection Agency (EPA) National Ambient Air Quality Standards, designed to protect public health and the environment.
- 2.** The local food systems goals are to maintain a healthy, sustainable, equitable, and thriving local food system with healthy, affordable, and culturally relevant food for all.
- 3.** Heat resilience aims to reduce the impact of high temperatures by working to mitigate heat risk to people, especially vulnerable populations, and provide access to chilled drinking water, and cool and shaded respite spaces.
- 4.** Water supply resilience seeks to provide a clean and reliable water supply for 100 years through a diverse portfolio, data-driven, smart water management, and water-use efficiency and conservation.

KEY ACTIONS TAKEN SINCE 2021

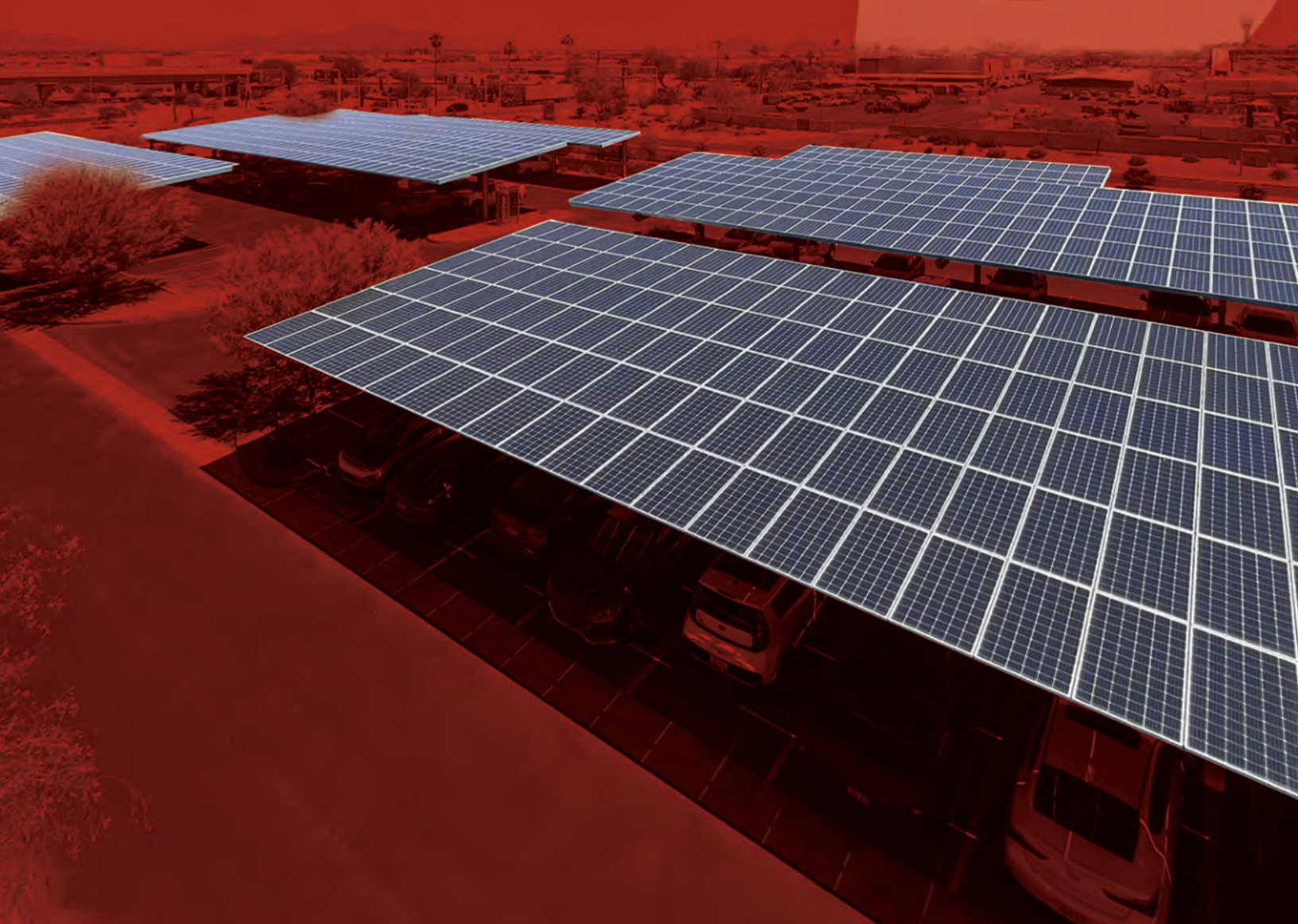
The following highlights actions taken since the 2021 Climate Action Plan for GHG emissions reductions and increased resiliency through May 2024



EMISSION REDUCTIONS

- Stationary Energy Sector (SES)
- Transportation Sector (TS)
- Waste as a Resource (WR)

SES



STATIONARY ENERGY SECTOR

Phoenix continues to collaborate within the community to create and to bring more zero emission energy sources online. The City also strives to increase access to zero emission energy sources and to increase energy efficiency.

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- City of Phoenix stationary renewable energy and energy efficiency
 - Solar installation permit approval streamlining
 - Electric vehicle infrastructure requirements



Community Initiatives are identified by a heart with two hands shaking, symbolizing community partnership and collaboration.

CITY OF PHOENIX STATIONARY RENEWABLE ENERGY AND ENERGY EFFICIENCY

Renewable energy credits may help the City meet its renewable electricity goal for City processes. Phoenix has 20 megawatts (MW) of solar credits in the Renewable Energy Certificate Agreement from the Cooper Crossing Solar Ranch from 2023 until 2033. The City started a 15.4 MW Biomass Agreement to share costs for biomass power production among partners and the Salt River Project Agricultural Improvement and Power District from 2023 to 2033. There is an existing SRP Solar Agreement with Phoenix through Saint Solar in Coolidge, Arizona, for 10.7 MW from 2020 through 2035. The City also has 1.7 MW of hydro credits from Hoover Dam, which started in 2016 and is in perpetuity. **These renewables make 39% of the energy used for City water services carbon neutral.**

A 210-kilowatt (kW) solar array constructed at Sky Harbor International Airport Emergency Operations Center came online April 29th, 2024. The solar array is expected to support about 55% of the center's electricity needs and bring the total onsite solar capability to 6.2MW.



The Phoenix Aviation Department has established plans to install additional solar systems at Sky Harbor International Airport to reach net zero carbon emissions by 2040. Two approximately 5.5 MW solar systems will be installed at the 44th St and 24th St parking areas to provide up to 100% of the PHX Sky Train® power usage. There are also plans to build a solar array covering the parking structure at Terminal 4 to provide about 5 MW, or approximately 12% of the terminal 4 electric usage. Grant funding was awarded by the Federal Aviation Administration (FAA), which partially funds the design and construction of the solar systems.

The Phoenix Aviation Department requires all new and renovated aviation facilities to be designed and built to Leadership in Energy and Environmental Design (LEED) or Envision rating standards. LEED and Envision prioritize energy-efficient design. Envision is a sustainability and resilience indicator framework used to evaluate and quantify infrastructure project sustainability. Aviation has incorporated LEED standards into construction for several years, the most recent being the Terminal 3 modernization, which achieved LEED Silver in 2021. The Department is currently pursuing LEED Silver for the eighth concourse of Terminal 4, which opened to the public in June 2022. Sky Harbor International Airport's PHX Sky Train® Phase 2, which opened to the public in December 2022, was the first project in the Phoenix airport system that followed Envision standards, achieving Envision Gold in April 2020.

Heating, ventilation, and air conditioning (HVAC) units may use refrigerants that can be powerful GHG emitters, and older models may use much more electricity than newer ones. Over 130 HVAC units were upgraded at City facilities from June 2021 through April 2023. The target HVAC replacement is 50 units per year through 2035. Replacing older units saves on electricity through increased efficiency and, as a result, reduces GHG emissions. The newer HVAC units often use newer refrigerants that have lower GHG warming potential.




SOLAR INSTALLATION PERMIT APPROVAL STREAMLINING

SolarApp was piloted by Phoenix in 2022 and is managed by the Planning and Development Department. The software program removes plan review from the permitting process by taking applicant project data and making sure it meets building code requirements. SolarApp became a permanent program for the City at the end of 2023.



ELECTRIC VEHICLE INFRASTRUCTURE REQUIREMENTS

 Electric vehicle (EV) infrastructure, such as charging stations, EV capability, or EV-ready infrastructure, is applied via stipulations on sites proposing to rezone land for multifamily, commercial, or industrial development. Stipulations for EV infrastructure vary based on the type of land use and scale proposed and have been implemented via rezoning cases starting in March 2023. This new policy administered by the Planning and Development Department is expected to increase the amount of EV charging infrastructure.





TRANSPORTATION SECTOR

Most of Phoenix's GHG emissions come from the transportation sector. The City and the Phoenix community are adding infrastructure and vehicles that use more low and zero-emission fuels. Active transportation such as biking and walking is also heavily encouraged. Active transportation is especially important for Phoenix's Transit Oriented Development areas.

- Active and alternate means of transportation
- Light rail expansion and Walkable Urban Code update
- Fuel cell hydrogen, battery electric, and hybrid electric buses
- Transportation Electrification Action Plan
- Alternatively fueled vehicles at airports

ACTIVE AND ALTERNATE MEANS OF TRANSPORTATION

Active transportation is human-powered mobility, such as bicycling, walking, or rolling (e.g., scooters, skateboards, and rollerblades).

Phoenix City Council approved an update to the Active Transportation Plan and the Comprehensive Bicycle Master Plan in May 2023.

These plans use a community-based approach to planning and implementing active transportation networks, such as adding 100 miles of bidirectional bike lanes to Phoenix roads since 2021.

In January 2023, Phoenix launched a permanent micromobility program that included e-scooters, e-bikes, traditional pedal, and adaptive bikes.



LIGHT RAIL EXPANSION AND WALKABLE URBAN CODE UPDATE

Light rail provides greater public transit access to residents and helps reduce GHG emissions.

As of 2024, there are 18 miles of light rail in Phoenix, with additional extensions in various planning, design, and construction stages. The first of these to be completed since the 2021 CAP is the 1.6-mile Northwest Extension Phase II that opened in January 2024. The project includes a bridge that crosses the I-17 highway, leading to an elevated end-of-line station and an adjacent four-story parking garage with solar panels. The light rail station is the top story of a multimodal transportation hub, the Thelda Williams Transit Center, which is serviced by local and express buses, with a possible future expansion to add Bus Rapid Transit.

Public transit is a key strategy to lower transportation related GHG emissions through increased use and the creation of spaces and infrastructure around transit that enables its use. Phoenix received two transit-oriented development (TOD) planning grants through the Federal Transit Administration (FTA) to support this effort since 2021, described below. These grants have enabled the City to capture a community-led vision for more sustainable development along extensions to the light rail corridor that considers walkability, safety, and land use density (for example, development that integrates housing, restaurants, and retail).



Phoenix City Council adopted the South Central TOD Community Plan in March 2022. This plan will serve to attract, guide, and prioritize strategic investments in infrastructure, housing, economic development, and other areas to realize a shared community vision — to make South Central a world-class destination in which current and future residents both share in the prosperity a walkable and transit-oriented community brings. In November of 2022, the FTA announced the award of a \$1 million grant for Phoenix to allow the implementation of the goals identified in the South Central TOD Community Plan.



In April 2024, the City was awarded a \$1.2 million grant from the FTA for TOD planning efforts with an emphasis on affordable housing and mixed-use development for the Phoenix Main Line, which includes the original light rail line that opened in 2008, the Northwest Extension Phase I that opened in 2016, and the 50th Street Station that opened in 2019.

The Walkable Urban Code promotes walking, bicycling, and transit use by emphasizing increased density, decreased automobile reliance, and creating active and welcoming street and sidewalk environments near transit. Phoenix City Council approved an amendment in 2022 to allow the Walkable Urban Code to be used throughout all current and future light rail corridors. The code encourages a minimum of 75% shade coverage on sidewalks or pedestrian ways for new development in TOD areas.

FUEL CELL HYDROGEN, BATTERY ELECTRIC, AND HYBRID ELECTRIC BUSES

Phoenix and our partner Valley Metro provide reliable public transit for the greater Phoenix region. We are in the process of beginning to transition our fossil-fueled fleet to a fleet with a lower fossil fuel emissions footprint.

In December 2022, the Phoenix City Council approved the Public Transit Department's plans to purchase 69 hybrid electric buses (HEB), 52 fuel-cell electric buses (FCEB), and 44 battery electric buses (BEB) through the year 2030.

In 2023, an order was placed for 20 HEB. Four HEBs are in service, and 19 HEBs were delivered as of August 2024.

Orders have been placed for 12 FCEB and 12 BEB through 2024, with the first delivery scheduled for 2025. The department's current fleet transition plan sets the goal to ultimately operate up to 450 FCEB and 50 BEB, based on the operating parameters for each vehicle type.



TRANSPORTATION ELECTRIFICATION ACTION PLAN

The Transportation Electrification Action Plan, or EV roadmap, was approved by the Phoenix City Council in June 2022.

Phoenix is electrifying its fleet with an implementation goal of 200 EVs in the fleet by 2030. As of September 2024, the City has 74 EVs in its fleet, with orders placed for two EVs for fiscal year 2024 and 48 EVs projected to be ordered in fiscal year 2025.



Phoenix is committed to green fleet technology related to alternative fuels and new vehicle technology, focusing on low-carbon alternative fuel and electric vehicles. The City received the **Top Green Fleet Award** in August 2023 from the National Association of Fleet Administrators (NAFA). The Top Green Fleet Award recognizes organizations that make a positive fleet environmental impact and groundbreaking initiatives.

"The City of Phoenix really does it all," said Rhea Courtney Bozic, NAFA's Chief Judge of the Green Fleet Awards. "Its clean fuel integration is the best in the country. They have excellent training for staff and a strong organizational commitment to greenhouse gas reduction."

In November 2023, Phoenix received the **EV City Award** from Plug In America for its efforts identified in the Transportation Electrification Action Plan.

"The City of Phoenix is a shining example for cities around the country when it comes to the creation and implementation of an electric vehicle program," said Joel Levin, Executive Director of Plug in America.

ALTERNATIVELY FUELED VEHICLES AT AIRPORTS

The Sky Harbor International Airport all-electric PHX Sky Train® final stage was completed in December 2022, adding two new stations. The PHX Sky Train® connects the 44th Street light rail stop, airport terminals, and the Rental Car Center. The two new PHX Sky Train® stations are located at the Rental Car Center and the 24th Street Express Pay Parking lot. Completing the PHX Sky Train® allowed the retirement of 78 compressed natural gas-fueled buses that provided shuttle services between airport terminals and the Rental Car Center.



Since October 2021, Aviation has installed 75 vehicle charging stations for the public, employees, and fleet vehicles at airport facilities. Additionally, Aviation completed an EV charging study in 2023 and is developing a roadmap and implementation plan to meet the ever-increasing demand for EV charging amongst customers, business partners, and employees. Advanced Air Mobility (AAM) integrates highly automated aircraft into the national air space, including electric aircraft. Aviation completed an AAM study and framework in 2024 to identify infrastructure needs and operational use cases to accommodate electric aircraft as that industry sector matures. In 2024, Aviation is developing an Electric Utility Master Plan to identify and meet future electrical needs for EVs, AAM, and passenger growth while ensuring resiliency.





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CAUTION
WIDE
RIGHT
TURNS
DO NOT PASS
ON RIGHT

CNG

DO NOT
BLOCK
City Code Section 21-4

WASTE AS A RESOURCE

Phoenix is increasing the amount of waste diverted from landfills through recycling and composting, including around large special events like Super Bowl LVII and the March Madness Final Four. Organic waste in landfills releases GHG methane emissions. Composting this organic waste reduces GHG production and generates a marketable product called compost. The City's composting facility can process up to 55,000 tons of organics annually. Other waste reduction efforts include the reuse of buildings and land through the Adaptive Reuse Program and brownfield redevelopment.


- Organic waste and special event diversion
- Citywide recycling and organic waste diversion
- Building Adaptive Reuse Program
- Brownfield redevelopment

ORGANIC WASTE AND SPECIAL EVENT DIVERSION

Green organic waste is diverted from landfills partially through the Phoenix Green Organics Residential Collection Program. There were 7,852 tons of green organic yard waste collected in fiscal year 2021 and 8,108 tons collected by Phoenix in fiscal year 2022. Additional green organic waste diverted from the landfill is brought directly to the City's 27th Avenue and North Gateway Transfer Stations by residents, City departments, and landscapers.

Phoenix began collecting food waste organics for processing into compost at Sky Harbor International Airport in October 2023 in partnership with airport vendors. The Phoenix Convention Center reestablished a sustainable composting program in 2022. Composting removes organic material from the waste stream, creates less methane from decomposition than if it went to a landfill, and reduces transportation GHG that would result if the material were taken to the landfill. Composting also saves landfill space and creates a functional product.

The Phoenix Zero Waste Team launched a food waste collection pilot at five public schools in 2022-2023 with US Department of Agriculture grant funding. The pilot project was designed to educate students on the benefits of composting while also diverting valuable material away from the landfill. All food waste collected from the schools is sent to Phoenix's Compost Facility for processing, which turns the food waste into a nutrient-rich soil amendment that can be applied back to parks and gardens. After grant funding concluded in December 2023, four of the five schools continued with food waste collection.

 Phoenix hosts major events like Super Bowl LVII and the 2024 March Madness Final Four. The City works to recycle as much waste as possible to make the events more sustainable. The Phoenix Convention Center and the Public Works Department worked together on large-scale events like the Super Bowl LVII NFL Experience, Fan Fusion in 2023, and the Final Four Fan Fest in 2024. The overall waste diversion rate during Super Bowl LVII City-held events was 92.6%, qualifying as zero-waste with over 100,000 attendees. The 2024 Final Four Fan Fest had a 94.2% waste diversion rate for City-held events, qualifying as a zero-waste event with 52,283 attendees.



CITYWIDE RECYCLING AND ORGANIC WASTE DIVERSION

Phoenix processed 124,876 and 119,420 tons of residential recyclables in fiscal years 2022 and 2023, respectively. Additionally, Phoenix processed 39,007 and 40,241 tons of organic waste, respectively, in fiscal years 2022 and 2023. The waste diversion rate was approximately 31% for both years. The Aviation Department achieved a 48.5% waste diversion overall for fiscal year 2023.

Phoenix opened a circular economy microfactory manufacturing facility in February of 2024 at the Phoenix Goodwill Center. This is a new plastics recycling and remanufacturing microfactory that converts waste material into new products, creating green skilled job opportunities, and a cooperative business model. The facility results from partnerships between Goodwill of Central and Northern Arizona, Hustle PHX, Arizona State University, and Phoenix.



In 2021, Phoenix began transforming its 27th Avenue material recovery facility (MRF) to adapt to changing material streams. The 27th Avenue MRF renovations are expected to be completed in Fall 2024 and will increase recycling capture rates. The new MRF technologies will improve the capture of the commodities in the current recycle stream, which includes plastics, cardboard, paper, aluminum, and other metals.



Phoenix collects recyclables from City operations, including cardboard and steel from the Public Works Department's Fleet Services Division, as well as fleet vehicle tires, oil filters, and batteries for recycling. About 1,435 tons of steel were recycled in fiscal year 2023. There were about 12,895 City fleet tires and approximately 5,621 fleet vehicle batteries that were recycled in fiscal year 2022.

BUILDING ADAPTIVE REUSE PROGRAM



The Adaptive Reuse Program (ARP) implemented by the Planning and Development Department assisted 15 projects in fiscal year 2022 and 23 projects in fiscal year 2023. The ARP uses existing infrastructure to revitalize and stimulate economic activity in neighborhoods. When buildings are reused, they reduce the demand for new construction and associated GHG emissions.

Phoenix advertises and educates stakeholders about the ARP assistance to small businesses through commercial real estate companies, the Urban Land Institute, Phoenix Community Alliance, Downtown Phoenix Inc., and South Central Collaborative. Incentives are available for smaller building reuse with up to \$7,000 that could apply to the site, civil or building plan review, and permit fees. Larger buildings are eligible for program relief, which includes streamlined processes, expedited reviews, and other project cost savings.



BROWNFIELD REDEVELOPMENT

The City launched the Arizona Fresh Agri-food Innovation Center with a lease signing ceremony in October 2022. The Arizona Fresh project will promote capital investment, job creation, and planning for entrepreneurial spaces for food innovation. A community park will also be developed on the site with green space along the Rio Salado. This project will be the largest Brownfields to Healthfields project in Arizona. Phase one of the project (four phases) is currently in the design and permitting stage, with construction expected to start in the first quarter of 2025.

WHAT WORKS CITIES PLATINUM CERTIFICATION

Phoenix was awarded What Works Cities Certification at the Platinum Level in January 2024, the highest level of recognition from the international standard of excellence in data-informed city government. The certification recognizes cities for the strategic use of data, evidence, and community engagement to inform policy decision-making, including climate action and water conservation. Phoenix advanced from the Gold Level, achieved in 2021, and is one of five cities to receive the Platinum distinction. The certification program was launched in 2017 by Bloomberg Philanthropies and is led by Results for America.





RESILIENCY

- Air Quality (AQ)
- Local Food Systems (LFS)
- Heat (H)
- Water (W)



AIR QUALITY

- Plans to meet air quality standards



AIR QUALITY

Criteria air pollutants include carbon monoxide, lead, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), ozone, particulate matter 2.5 microns or less (PM_{2.5}), and particulate matter 10 microns or less (PM₁₀). These criteria air pollutants are regulated by the EPA through the Clean Air Act and impact public health and the environment. Maricopa County is in moderate nonattainment for ozone and is expected to move to serious nonattainment in the near future. The EPA also reduced the air quality standard for the allowable annual concentration of PM_{2.5} in February 2024. Maricopa County is unlikely to meet attainment when evaluated against the new standard. Maricopa County is currently in serious nonattainment for PM₁₀ and is considered 'in maintenance' for carbon monoxide after being in serious nonattainment from 1992 to 2004. Our area currently meets and exceeds the EPA standards for the criteria air pollutants NO₂ and SO₂. Phoenix partners with other governmental entities, including the Maricopa County Air Quality Department (MCAQD), Arizona Department of Environmental Quality (ADEQ), and Maricopa Association of Governments (MAG) to work toward meeting these standards.



In 2022, Phoenix became a Signatory City of the C40 Clean Air Cities Declaration which requires Phoenix to report progress updates to C40's Clean Air Accelerator. The 2023 report included setting baseline levels for air pollutants and reduction targets and updates on new polices and top pollution-reducing actions. Phoenix collaborates with other regional partners for maintaining real time monitoring and emission inventories, such as ADEQ, MCAQD, and MAG.

As a major employer, Phoenix is required by Maricopa County Ordinance P-7 to develop, implement, and maintain a Travel Reduction Program (TRP) to reduce air emissions related to employee commutes. The TRP includes employee benefits to promote mass transit use, carpooling, biking, or walking to reduce the number of miles traveled for employee commutes rather than commuting using single occupancy vehicle (SOV) trips. The goal of the program is for all worksites to have no more than 60% of employees commuting via SOV. Between 2021 and 2023, Phoenix saw a reduction in the employee commute SOV rate from 81.68% to 77.83%.





LOCAL FOOD SYSTEMS

- Integration of food goals into land use planning
- Local food production economic and workforce capacity development
- Partnerships for sustainable food practices
- Increased access to healthy food and education

INTEGRATION OF FOOD GOALS INTO LAND USE PLANNING

Phoenix integrated food system objectives into the South Central Extension Transit Oriented Development Plan, which Phoenix City Council approved in March 2022. The Aviation Land Reuse Strategy Plan includes food system objectives such as agri-food technology innovation.

LOCAL FOOD PRODUCTION ECONOMIC AND WORKFORCE CAPACITY DEVELOPMENT



Phoenix incorporated agri-food technology innovation implementation strategies into the Community and Economic Development Department Annual Strategic Plans in fiscal year 2022. Activities are included to support, promote, and enhance agri-food entrepreneurship, innovation, and resilience within each step of the local food system.



In calendar years 2022 and 2023, Phoenix offered two workforce development programs. In partnership with Thrive Consulting (Thrive), the City offered the Sustainable Food Business Worker Cooperative Training Program. Fifty-three residents completed the training program across five cohorts, including one Spanish-speaking cohort. Thrive held six workshops in 2022-2023 to educate more than 200 attendees on the cooperative and sustainable food economy, cooperative ecosystem development, finance, incorporation, and community wealth building. The Urban Agriculture Fellowship program was offered in partnership with nine small Phoenix urban farms, with nine fellows trained directly by urban farmers, resulting in two permanent jobs with host organizations.



PARTNERSHIPS FOR SUSTAINABLE FOOD PRACTICES



The American Rescue Plan Act (ARPA) supported City grant funding in 2022 and 2023 to food businesses and nonprofits within the Phoenix area through three grant programs, including Agri-food Technology Innovation, Resilient and Sustainable Agriculture, and Food Systems Transformation. These grants contribute to a sustainable food system, provide increased access to healthy food, and incorporate practices that consider the impacts of climate change. The grants also encourage establishing sustainable practices such as water efficiency, energy efficiency, waste diversion, adaptation methods to increased heat, and supporting agri-food tech innovation. A total of \$1.6 million was provided to 23 entities across the food system. The funding was utilized to establish Phoenix's first vertical farm operations, train 160 individuals on indoor farming methods, and help expand sustainable mushroom and microgreens production.



INCREASED ACCESS TO HEALTHY FOOD AND EDUCATION



Phoenix graduated the first Sustainable Food Business Worker Cooperative Incubator Program cohort in partnership with Thrive Consultancy and the ASU Sustainable Economy Lab in November 2021, focused on veterans, women, and people of color. Five veterans completed the training program, resulting in the first worker cooperative incorporated, one startup ghost kitchen (that provides delivery only), and one business expanding sustainability measures within its existing operations.



In 2021, the Phoenix Backyard Garden Program was established to empower Phoenix residents to grow their own produce and increase access to healthy food for those most impacted by food insecurity. The program has continued through 2023 and has provided 254 residents with a choice of three garden systems, including a traditional raised bed, an advanced raised bed, and an aquaponics system. In addition to the system, residents received seeds, plants, and fish for the aquaponics system, education and training, and system maintenance for one year. Upon completion of the program, the resident keeps the garden system.



HEAT

The summer of 2023 was record-breaking for heat in Phoenix, with 31 straight days over 110° Fahrenheit and one of the lowest rain totals for a monsoon season, with a rainfall total recorded at Sky Harbor Airport of 0.15 inches. Extreme heat represents a significant climate risk, with 340 heat-associated deaths reported in Phoenix during 2023.

- Actions that reduce heat health impact
- Tree planting
- Cool corridors and other shade implementation
- Cool Pavement Program

ACTIONS THAT REDUCE HEAT HEALTH IMPACT

The City's 2024 Heat Response Plan was presented to Phoenix City Council in February 2024. It outlines 39 actions across nine strategy areas Phoenix leads and coordinates to protect the public from adverse health outcomes associated with extreme heat.

Phoenix City Council passed a new ordinance that requires contractors who work with the City to enact heat safety protections for outdoor workers in March 2024, which took effect in May 2024. The new rule requires those contractors to have a heat safety plan that provides free cool water to employees, shade and air conditioning accesses, hydration breaks, and training.

Phoenix continues to participate in the Maricopa County Heat Relief Network, with numerous facilities participating in 2024, offering cooling centers and hydration stations. Phoenix added extended hours, overnight capacity, and professional navigation services at five Heat Relief Network locations in the summer of 2024. A dedicated heat respite and navigation space is available at the Burton Barr Central Library 24 hours daily, every day of the week. The Senior Opportunities West Senior Center offers overnight heat respite and navigation services. The Harmon, Cholla, and Yucca Libraries remain open as cooling centers with dedicated staffing until 10 pm every day of the week and added open hours as a cooling center from noon to 10 pm on Sundays.



The City's *We're Cool* effort continued in 2023 in partnership with community volunteers who contributed more than 1,700 service hours. More than 8,300 outreach contacts were made with those experiencing homelessness and others at risk for heat. *We're Cool* works to connect individuals with cooling centers and hydration stations, as well as water, shelter, rehabilitation, and rescue services.



Phoenix launched the Innovate PHX Challenge at Venture Cafe Phoenix in 2023 to engage innovators, residents, educators, and businesses in day-long “hackathons” to develop solutions to the City’s identified priorities, including resilience to extreme heat. More than 300 community members have participated, and Phoenix is currently implementing and testing winning ideas. The last event was held in June 2024.

In 2024, Phoenix implemented a data-driven pilot program to increase equitable access to chilled drinking water in public spaces. Three custom-designed chilled drinking water fountains with heat-mitigating technologies were installed near City Hall in the Marvin A. Andrews Plaza, Cesar Chavez Plaza in Downtown Phoenix, and the Roosevelt Mini Park. Ongoing evaluations of these systems will inform future expansion of the pilot.



TREE PLANTING

About 6,400 trees were planted citywide on public property in 2022 and 2023 by the Office of Heat Response and Mitigation, as well as the Parks and Recreation and Street Transportation Departments. These 6,400 trees include 1,500 trees planted by the Parks and Recreation Department and about 2,850 trees planted by the Street Transportation Department. The City emphasizes the “right tree in the right place” by evaluating site-specific considerations for planting locations and prioritizing the use of low water use species.



Phoenix was awarded a \$10 million grant in 2023 from the US Forest Service Inflation Reduction Act (IRA) funding to support tree planting in heat-vulnerable areas. Trees can provide additional shade, lower energy bills, create green jobs and cleaner air, and build community urban forestry skills.



ARPA funds allowed the City to fund tree planting opportunities for the community starting in September 2023 through two new grant programs: the Community Canopy Grant Program with 437 households participating planting 840 trees and the Canopy for Kids Grant Program with 7 schools participating planting 200 trees as of August 2024.



COOL CORRIDORS AND OTHER SHADE IMPLEMENTATION

Cool Corridors were introduced as a City of Phoenix initiative in the 2021 Climate Action Plan with the vision of creating high shade coverage along heavily used pedestrian paths.

The first Cool Corridor was created next to Cesar Chavez Park in 2022 with 259 trees planted. As of December 2023, there was an overall survival rate of about 94%. The few trees that did not survive after the initial planting were replaced.



In 2022, Phoenix implemented a walkshed mapping tool funded through the 2018 Bloomberg Philanthropies Mayors Challenge to advance the HeatReady PHX concept. The Walkshed tool uses data to identify key pedestrian corridors for adding shade in vulnerable areas.



The City used ARPA grants for shade construction in the community through the Shade for Students Grant Program, which supports the installation of shade structures beginning in September 2023.

Phoenix installed 220 new shade structures at bus stops between October 2021 and September 2023. A total of 75% of the 4,082 bus stops in Phoenix have manufactured shade as of January 2024.



Public art projects incorporating shade, cooling, and heat mitigation are included in the 2023-2028 Public Art Plan that Phoenix City Council approved in July 2023. Through this initiative, artists will work with communities to enhance the pedestrian experience by increasing shade options and improving shaded connectivity.



In 2023, Bloomberg Philanthropies selected Phoenix as one of eight cities to receive a \$1 million grant for its Public Art Challenge. This unique program supports temporary public art projects that address essential local civic issues in cities nationwide. Phoenix's project, *¡Sombra! The Celebration of Shade* will commission artists to create shading and cooling installations in response to extreme urban heat.

City staff continued developing an update to the 2010 Tree and Shade Master Plan, now called the Shade Phoenix Plan. This new plan was introduced to Phoenix City Council in June 2024 and will be presented to Phoenix City Council for full adoption in Fall 2024.

COOL PAVEMENT PROGRAM

Phoenix is deploying a reflective coating on streets, Cool Pavement, designed to increase street materials' lifespan and alleviate adverse impacts of the urban heat island effect. The City's Cool Pavement Program advanced out of the pilot phase in April 2023 into a full program within the pavement maintenance program, expanding to 11 locations.

Phoenix reached its 100th mile of installed cool pavement in June 2023.

The WTS Metropolitan Phoenix Chapter recognized the Cool Pavement Program for the **2022 Innovative Transportation Solutions Project of the Year** award.





WATER

Phoenix initiated a Stage 1 Water Alert in June 2022 as part of the City's ongoing commitment to sustainable water management and in response to the shortage of water on the Colorado River affecting our region. This precautionary step is an integral component of the City's Drought Management Plan. While there is no immediate shortage, Phoenix is implementing voluntary water conservation measures in partnership with the community. By taking simple steps such as reducing outdoor watering, fixing leaks promptly, and using water-efficient fixtures, customers can help safeguard the City's water supply against potential future shortages and contribute to resilience against drought conditions.

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- Water infrastructure and reclamation
 - City water conservation
 - Community-wide water conservation
 - Green stormwater infrastructure

WATER INFRASTRUCTURE AND RECLAMATION

The Drought Pipeline Project brings water to north Phoenix to make sure all residents have access to safe, reliable, and clean drinking water during times of shortage on the Colorado River. The project is essential to Phoenix's economic health and vitality, serving up to 400,000 residents. The Water Services Department's construction of the Drought Pipeline was completed in August 2023.



Phoenix City Council approved rehabilitation of the Cave Creek Water Reclamation Plant (CCWRP) in October 2023 to use advanced water purification (AWP) technologies for wastewater treatment to potable standards. Phoenix City Council approved a construction contract for rehabilitation of the CCWRP in February 2024. In addition, the City, in a collaborative effort with partner cities and other stakeholders, plans to build a state-of-the-art regional AWP plant at the 91st Avenue Wastewater Treatment Plant by 2030, which could produce 60 million gallons of potable water daily, providing enough water for 200,000 households. This facility will reduce dependence on the Colorado River and support the Valley's growing population.



CITY WATER CONSERVATION

Phoenix launched its internal Drought and Shortage Response Team (DSRT) in 2023 to reduce water use by City departments. The DSRT is currently working towards implementing four policy goals: eliminate non-functional turf, irrigate all landscapes efficiently, convert all fixtures and appliances to meet EPA Water Sense Standards, and operate all cooling towers efficiently.

Through DSRT, the Water Services Department partnered with the Housing Department on two water conservation projects for their facilities.

The first of these projects was a Maryvale Parkway Terrace (MPT), where the evaporative cooling system was found to be a significant source of water waste. In July 2023, Water Services funded the purchase and installation of a new cooling tower controller at MPT, which resolved the water release issues.

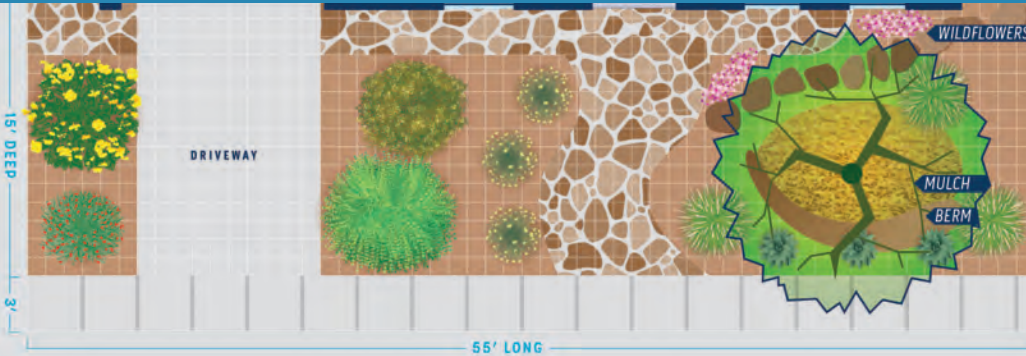
In Summer 2023, Water Services, in partnership with Proctor and Gamble, 50 Liter Home, Business for Water Stewardship, and the Pacific Institute, initiated a 10-year pilot program installing toilet leak detectors at Sunnyslope Manor, a multi-housing senior facility located in the Sunnyslope neighborhood. Water Services is now tracking the water savings to evaluate whether leak detectors should be installed at additional City-owned sites.




COMMUNITY-WIDE WATER CONSERVATION

Water savings incentive programs, including irrigation controllers and toilet retrofit programs for residential use, were launched in September 2023 and received 90 applications as of April 2024.

 Landscape watering represents the largest share of the water residents use in Phoenix. In 2023, Phoenix developed “off the shelf” xeriscape conversion plans for common lot sizes and setbacks for residents, which are available to the public.



 Common landscape areas consume most of the water Homeowners Associations (HOA) use. Phoenix has been working to increase the water efficiency of these landscapes while still maintaining their attractive, valuable, and functional features through a Homeowners Association Audit Program (HAAP). There are currently 125 communities participating in HAAP with 27 million gallons of water savings. The HAAP was officially established in January 2022 and was approved as part of the citizen driven ad-hoc water conservation plan in November 2019.

In the spring of 2024, Phoenix received a \$3 million grant from the Arizona Water Infrastructure Finance Authority for a grass removal incentive program. Shortly after that, Phoenix started a pilot program for non-residential water customers, offering \$2 per square foot for grass removal. Phoenix anticipates initiating a similar program for residential customers later in 2024.



GREEN STORMWATER INFRASTRUCTURE



Green stormwater infrastructure (GSI) provides significant benefits, including reduced local flooding, improved infiltration, water conservation (by utilizing stormwater to help water plants), and reduced urban heat island effect (particularly when GSI is used to support vegetation). Beginning in 2023, the Planning and Development Department began requiring low-impact GSI techniques on select sites proposing to rezone land for development. A minimum of two GSI techniques are required for each private development site where this stipulation is required. Phoenix co-hosted a GSI workshop for professional design focused on GSI in Summer 2023 and is currently working on a handbook for homeowners.



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