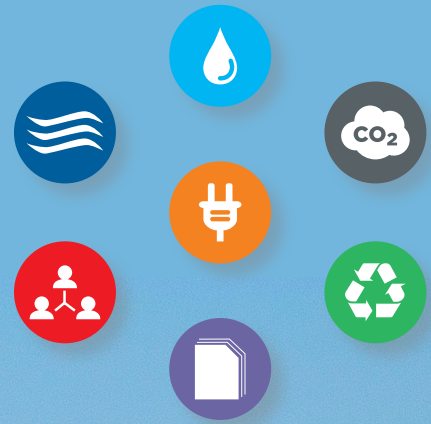


Sustainability Management Plan Update Report

January 2022

EXTERNAL





Letter from the Director



Chad R. Makovsky, C.M.
Director of Aviation Services

The City of Phoenix Aviation Department has a decades-long commitment to sustainability. Our commitment is visible in our successes. For example, Phoenix Sky Harbor International Airport was one of the first airports in the country to transition to an alternative fuel bus fleet. And since 2012, we've focused on solar power by adding panels at our Rental Car Center, East Economy parking areas, and more recently at our Aviation Headquarters building.

Our sustainability focus was strengthened in 2015 when we adopted our first Sustainability Management Plan. This living document focuses on seven overlapping areas of emphasis: air quality, energy conservation, greenhouse gas emissions, stakeholder outreach, policies and planning, waste diversion, and water conservation.

I'm proud to share our many recent successes which are noted in this Sustainability Management Plan Update. This includes a robust xeriscape program that is saving about 5 million gallons of water a year as well as an estimated \$400,000 in labor and materials. This year we were also recognized by Airports Council International achieving a significant industry milestone of 'Level 3 – Optimization' through the Airport Carbon Accreditation program. This is the only institutionally endorsed, carbon management certification standard for airports.

We've made great progress, but our work has only just begun. As we look to the future, we must continue to lead by identifying every opportunity to incorporate sustainability measures into all our initiatives and supporting our business partners as they do the same. The important work we do today will ensure our industry remains vibrant, and opportunity exists for future generations. This important work is good for the environment; it is good for our community; and it is good for our business.

Today, I am pleased to announce we are rolling out our new sustainability brand—***Future Friendly: Sky Harbor Sustainability***. We will regularly incorporate this brand into future communications to serve as an important reminder of our collective focus. The Aviation Department is also developing a "roadmap to zero." This strategy will chart out our path to reach net-zero carbon emissions nearly a decade ahead of the United Nations Framework Convention Climate Change 2050 goal.

Given the globally connected nature of our business, we know we can't achieve our goals alone. We look forward to working with our community, business partners, the traveling public and YOU to make our airport system ***Future Friendly***.

AIR QUALITY



GOALS

- Develop a management plan for new generators and other stationary source emissions.
- Develop a procurement program for an Aviation Department electric vehicle fleet.
- Continue teaming with airlines and cargo carriers on electrifying ground support equipment.
- Form a committee for revised ground transportation provider "low emission vehicle" standards for each contract Request for Proposal.

Maintaining healthy air quality is a priority for the City of Phoenix. Due to the region's population, topography and meteorological conditions, dust and other air pollutants degrade air quality. The Aviation Department has a long history of taking voluntary actions that improve air quality. PHX was one of the first airports in the U.S. to have an alternative fueled bus fleet, and at the time, the largest publicly accessible CNG fueling station in the country. Since the 1990's, the airport implemented emissions standards in ground transportation contracts at PHX. The Sustainability Management Plan Update looked at additional voluntary measures that could be taken by the airport, airlines and ground transportation providers to improve local air quality.

Accomplishments/Metrics

The Aviation Department is addressing air quality through a variety of approaches. Some of the noteworthy accomplishments include:

- Extending the PHX Sky Train® to the west will complete the full extent of its service, giving access from the Valley Metro Light Rail to all terminals, and in 2022 from terminals to the Rental Car Center. Completion of this project will allow retirement of the airport's compressed natural gas bus fleet.
- Among City departments, the Aviation Department fleet uses the highest percentage of alternative fuels and is prepared to invest in electric vehicles as a next step.
- The PHX Trip Fee program imposes a charge on ground transportation providers accessing the airport, reducing airport roadway congestion and ground transportation vehicle "circling" while waiting for passenger pickups.
- To reduce emissions while on the ground, airline partners adhere to an aircraft pushback and one engine taxi policy. PHX also has 100% electric passenger bridges in place of commonly used fuel-driven equipment.
- Other best practices that reduce air contaminants by limiting vehicles accessing the airport are the use of passenger pick-up cell phone lots, free bus passes for the Aviation Department employees and some tenant employees, and Express Pay options in garages.



40

*charging stations
for electric ground
support equipment
(GSE)*

96

*diesel-powered GSE replaced
with electric models*

Progress Report

The Aviation Department continues to make progress towards air quality goals. Recent activities include:

- For the Aviation Department owned generators, the review of generator type, age and capacity resulted in older units being phased out for models with more stringent emissions standards.
- The airport installed 40 charging stations for electric ground support equipment (GSE) with funding from the FAA's Voluntary Airport Low Emissions (VALE) Grant and the support of Southwest Airlines, United Airlines and American Airlines, who replaced 96 diesel-powered GSE with electric models.
- The Trip Fee Program is now fully implemented across the range of ground transportation providers, hotel shuttles, Transportation Network Companies (TNCs) and off-airport parking companies. In addition to reducing on-airport ground vehicle movement and emissions, trip fees generate revenue to improve airport roadways and passenger drop off areas.
- Low Emission Vehicle / Alternative Fuels Standards – Analysis of EPA emissions standards was conducted, and ground transportation policies were updated for taxi fleets that originated at the airport.

WHAT'S NEXT

Upcoming initiatives include:

1. **Teaming with Airline Partners to Expand Electric GSE at PHX:**
In 2020, the airport completed construction of additional chargers using a second FAA VALE grant. At the planned Terminal 4 eighth concourse, infrastructure for more GSE chargers will be installed. Additionally, future airport infrastructure will continue to support airline conversion to electric GSE.
2. **Fleet Electrification:** Evaluate vehicles scheduled for replacement against vehicle availability and FAA grant funding criteria. Upgrade the Aviation Department's fleet with electric vehicles.
3. **Revise Ground Transportation Policy During New Contracts:**
Perform emissions analysis and develop an updated policy.
4. **Optimize Product Delivery to PHX Terminals:** Consider adding a centralized sally port to reduce the number of delivery trucks to terminal tenants.
5. **Construction:** Continue to implement best practices associated with low-emission construction equipment requirements.

ENERGY



GOALS

- Continue reducing energy use year to year by implementing energy conservation measures.
- Increase the use of renewable energy, either through on-site or "green power purchases" to meet the 15% renewable energy use goal by 2025.
- Reduce energy consumption at City facilities 30% compared to a 2012 baseline by 2030.
- After the completion of the PHX Sky Train®, establish a new energy use baseline and set a new reduction goal.
- Achieve net-zero GHG emissions for the Aviation Department electricity use by 2030 through renewable energy projects, energy efficiency upgrades, and utility partnerships.

Energy is used extensively at an airport to power key equipment, lighting and cooling systems. Increasing efficiency of these systems leads to decreased costs and associated emissions from the generation source of energy purchased. Data collected for the Airport Carbon Accreditation Program showed that purchased energy accounts for 90% of PHX's "carbon footprint". The Aviation Department focuses on both energy efficiency and sourcing of renewable energy as part of a comprehensive strategy.

Accomplishments/Metrics

As of 2020, the Aviation Department decreased energy used in its buildings by 22.83% since 2009 and reduced greenhouse gas emissions associated with electricity purchases. The following key accomplishments contributed to this reduction:

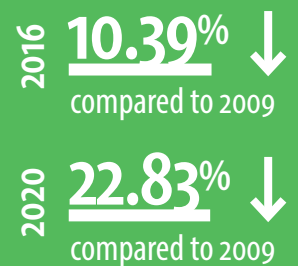
Implementation of a Strategic Energy Management Plan

The Aviation Department performed energy audits at PHX and developed a comprehensive list of energy conservation measures including implementation strategies. The execution of the Strategic Energy Management Plan played a major role in achieving this goal by documenting actions, tracking available funding and other energy conservation planning.

Full Implementation of Energy Software

Staff completed the upgrade of energy data analytical software to better track usage and areas where improvements can be made.

ENERGY REDUCTION



Note: 2020 Reduction Goal is absolute (i.e., addressing total energy consumption rather than on a per passenger basis) and excludes PHX Sky Train®, which was not in operation in 2009. Furthermore, 2020 electrical usage was lower than usual due to the impacts of the COVID-19 pandemic.





Annual energy cost savings of one million dollars were achieved from LED lighting conversions.

Accomplishments/Metrics (cont.)

Electrical LED Lighting Replacement Program

LED lighting conversions with lighting control systems are complete inside Terminal 3, the Terminal 3 Garage, the Terminal 4 Garage, in the East Economy Garage, and on the airfield. Annual energy savings of one million dollars were achieved from LED lighting conversions. The airfield ramp lighting and the Rental Car Center Garage conversions are scheduled next.

Onsite Renewable Electricity

Solar rooftop installations at the Rental Car Center and East Economy Garages produced 7,956,890 kilowatt hours of renewable energy in 2020, which is the equivalent of powering 650 homes, and avoiding over 4,100 metric tons in CO₂ emissions. An additional 580 kilowatts of solar covered parking arrays was recently installed at Aviation Headquarters parking lot.

Progress Report

Investing in high impact efficiency conservation measures (ECMs) have contributed to reduced energy use. Installing onsite renewable electricity has decreased greenhouse gas emissions associated with electricity purchased by the airports. Following the Strategic Energy Management Plan and working to meet the City's goal of using renewable energy sources for 15% of the electricity needs at the airport by 2025, remains an ongoing focus.

Development and construction projects regularly include the purchase of equipment that requires energy to operate. Accounting for the long-term total cost of ownership (TCOO) of new equipment during project design and procurement is anticipated to prioritize high efficiency equipment. Following feedback from a multi-division working group, staff modeled how changes in equipment choice affect both cost and environmental impact for the Terminal 3 Modernization Project. The next step is to integrate the TCOO evaluation into current engineering design and procurement processes.

New and renovated Aviation Department facilities are required to be at least LEED silver and/or Envision certified.

WHAT'S NEXT

Upcoming initiatives include:

1. **Controls Improvement:** Improve the Terminal 4 and Rental Car Center HVAC controls to optimize efficiency.
2. **Upgrade HVAC:** In 2022, fund HVAC system upgrades using various contract methods at Terminal 4, the Rental Car Center, and Aviation Headquarters.
3. **Install Solar:** In 2021, fund solar array installation using various contract methods at the Emergency Operations Center.
4. **Retro-commissioning:** Continue the retro-commissioning of Terminal 4 into 2022.
5. **Lighting Conversions:** Complete airfield ramp lighting and the Rental Car Center Garage conversions.
6. **Integrate Total Cost of Ownership Into Project Processes:** In 2023, formalize use of TCOO alternatives evaluation.
7. **Encourage Business Partners to Use Less Energy:** Engage with tenants and business partners to decrease electricity use via conservation measures.
8. **Update Energy Use Baseline:** After meeting the 2020 Better Building Challenge and completing the PHX Sky Train®, the Aviation Department will establish a new energy use baseline.

Construction of PHX Sky Train® platform





GREENHOUSE GAS EMISSIONS



GOALS

- Reduce GHG emissions 40% compared to a 2005 baseline by 2025 and 67% by 2040.
- Achieve net zero GHG emissions for energy purchases by 2030.
- Achieve carbon neutrality by 2050.
- Continue to achieve Airport Carbon Accreditation each year.

Greenhouse gas (GHG) emissions are produced as part of typical airport operations, primarily from the burning of fossil fuels. Approximately 90% of the airport owned and operated GHG emissions are indirect emissions attributable to electricity bought for use by the Aviation Department. The remaining 10% is from Aviation Department fleets.

Accomplishments/Metrics

The Aviation Department continues to demonstrate a reduction in GHG emissions annually. Because of PHX's energy conservation efforts, and an increase in solar and natural gas power plants by the local utility supplying power to PHX (i.e., "greening of the grid"), **the net result of PHX's GHG reduction is 27% per passenger between 2014 and 2019 for emissions from airport owned and operated sources.** The Aviation Department has also negotiated the ability to purchase approximately 60 million kilowatt hours per year, nearly a third of the energy use, on the open market allowing for future green power purchasing capabilities.

27% 2014-2019

net reduction in GHG emissions per passenger



In 2016, the Aviation Department joined the internationally recognized third-party verified Airport Carbon Accreditation (ACA) Program, a voluntary initiative for airports to demonstrate their commitment to reducing GHG emissions. PHX achieved certification at *Level 2* for inventorying and reducing scope 1 and 2 emissions from owned and operated sources each year, between 2014-2018.

For 2019, PHX achieved certification at *Level 3*, which included expanding the inventory with scope 3 emissions from tenants and users and engaging with them to reduce airport emissions.



Progress Report

Net Zero Carbon Roadmap

The Aviation Department is developing a “Roadmap” to Net Zero Carbon emissions. Components include reviewing past airport activities to remove carbon from its operations, forming a Task Force of Aviation Department management to prioritize and resource future actions, and developing a Plan-Do-Check action plan to allow tracking progress to attain zero carbon emissions.

With energy being 91% of PHX’s airport owned and operated carbon emissions, energy conservation and clean energy procurement is expected to be highlighted in the plan. Electric vehicle availability and procurement will also be reviewed. Opportunities for Scope 3 emissions reductions by tenants and airport users will drive discussion of new policy or contract changes to support those actions.

Implement Energy Conservation Measures

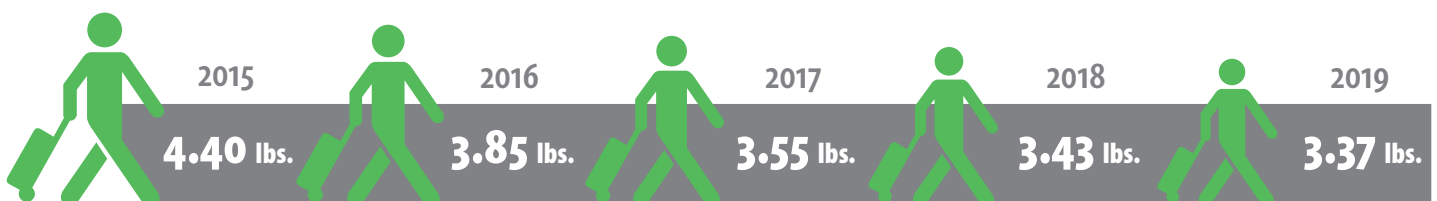
Beyond the airport’s replacement of less efficient equipment, discussions during the Sustainability Management Plan Update highlighted that new construction must take into account the Total Cost of Ownership – long term energy conservation and cost reduction - during design and procurement. (See Energy section for details.)

WHAT’S NEXT

The Aviation Department has committed to several ambitious goals. Upcoming initiatives in support of these goals include:

1. **Report at ACA Program Level 4:** The Aviation Department will report GHG emissions at PHX for *Level 4 – Transformation* for reporting year 2021. Level 4 inventories all GHGs at the airport, including tenants and flights. This effort allows for review of tenant and airport user emissions, and will set a path for the airport to engage in “influencing” tenants in ways to reduce carbon emissions, overall.
2. **Reduce Energy Use:** To continue to achieve year over year emission reductions, the highest level priority is to continue energy conservation activities and increase the supply of renewable electricity both onsite and through “green power purchases.”
3. **Net Zero Carbon Roadmap:** Develop a Roadmap for achieving Net Zero Carbon emissions. Form a Task Force to build consensus and identify funding for future actions.
4. **Encourage Business Partners to Decrease Scope 3 GHG Emissions:** Engage with tenants and business partners to decrease electricity and fuel use via conservation measures. While not in control of their business partner’s decisions, the Aviation Department will look for opportunities to support conservation measures that decrease GHG emissions.

Net GHG Emissions (Per Passenger)



Note: 2025 Goal for City Operations uses a 2005 baseline, which is inconsistent with the Aviation Department goal (2014 baseline). In addition, the Aviation Department is also currently reporting reductions in GHGs per passenger. This methodology is consistent with many airports.



OUTREACH



GOALS

- Outreach to schools around and near the PHX flight paths.
- Provide Science, Technology, Engineering, Art, and Math (STEAM) oriented presentations and airport tours.

The Aviation Department spoke and/or gave tours to

105 organizations

and reached

5,600 attendees

during Fiscal Year
2020-2021

The Aviation Department engages with passengers, employees, tenants and the local community. Since 2015, engagement has expanded to include more programs and events with the benefit of reaching thousands of people. A dedicated Public Relations Division coordinates communicating the latest developments and services.

Accomplishments/Metrics

Outreach activities are part of the Aviation Department's comprehensive communication approach to play a positive, active role in the Phoenix community. In response to the COVID-19 pandemic, all speaking engagements and airport tours were conducted virtually after March 2020. Highlights from the past year include:

105 Virtual Speaking Engagements/Airport Tours and Community Events

During fiscal year 2020-2021, the Aviation Department participated in 105 virtual community speaking engagements and Phoenix Sky Harbor International Airport (PHX) tours with more than 5,600 attendees. Speaking engagements include an overview of the City of Phoenix airport system such as customer amenities, historical background, capital improvements, sustainability, and initiatives like air service development. Participation in community events range from career days, literacy events, health and/or community and job fairs.

Expanding School Partnerships

The Aviation Department expanded its neighborhood School Partnership Program to include Whittier Elementary School. Aviation Department staff assisted with virtual participation in the school's Kids at Hope Career Day and virtual presentations on Phoenix's airports and aviation careers. Also, the Aviation Department strengthened partnerships with the Heard and Wilson Schools and the South Mountain High School Aerospace Academy by facilitating 10 virtual aviation presentations.



Accomplishments/Metrics (cont.)

Aviation Related Activities and Education Pages on skyharbor.com

The Aviation Department staff expanded content on the website to promote aviation and provide more than 60 aviation-themed activities and information in English and Spanish, including new word searches, word matches, and word scrambles, and more. The expanded section also includes details on airport jobs and aircraft functions as well as websites for local schools that focus on aviation skills development to work in the aviation industry.

PHX Comprehensive Asset Management Plan (CAMP) and Land Reuse Plan Outreach

In 2019, the Aviation Department presented development ideas for PHX and the surrounding Aviation Department owned land. Taking comments from the community, business partners, government agencies and other groups, the airport has a strategic roadmap for the future. In light of the COVID-19 pandemic, this plan is currently being updated.

Progress Report

The Aviation Department tailors outreach activities to passengers, employees, tenants and the greater Phoenix metro community. A sample of the breadth of activities and strategies include:

Passengers

Regular passenger communications are done via social media, website and passenger assistance technologies. In preparation for a possible extreme event that disrupts travel for passengers or other difficulties, an irregular operations plan is updated annually with the airlines. Also, Sky Harbor Navigators are a group of friendly volunteers at PHX whose mission is to make guests' experience at PHX faster, easier and more enjoyable by providing directions and information. In September 2017, a dog therapy program was launched called the Navigator Buddies. Sky Harbor also has one of the largest airport museum programs in the country, and exhibitions are located throughout the terminals for passenger enjoyment.

Employees

Activities span from career development training to community engagement activities such as hosting a Backpack-to-School collection program, holiday gift and clothing drives.

WHAT'S NEXT

Upcoming initiatives include:

1. **Green Tenant Program:** Partner with tenants to promote implementation of sustainability-related best practices, including preparing educational resources and developing outreach materials.
2. **Expand Local Retailers and Concessionaires at PHX:** Continue to grow the number of local retailers and concessionaires at PHX.
3. **Continue Community Engagement Activities:** Continue to seek opportunities to develop outreach programs that are enjoyed by a cross-section of the local community.
4. **Emphasis on Sustainability:** Promote our sustainability brand and initiatives both internally and externally.
5. **Net Zero Carbon Roadmap and Task Force:** The Aviation Department has a goal to reach net zero carbon emissions well in advance of the United Nations Framework Convention on Climate Change 2050 goal.

Tenants

Meetings are held regularly with tenants to discuss issues and opportunities and how the airport can support tenants' own sustainability goals. To that end, following a suggestion during the Sustainability Management Plan Update, a voluntary program, encouraging collaboration between the Aviation Department and airport tenants on sustainability goals is being developed.

Community

Identified in the community outreach plan and prioritized for action, expanding the number of small business and local retailers and concessionaires at PHX provides a sought-after opportunity and a tailored Arizona experience for travelers while supporting regional economic development.



POLICIES AND CONTRACTS



GOALS

- Adopt and revise annually the Aviation Department Design and Construction Standards.
- Continue to use the U.S. Green Building Council LEED Standards and the Envision Standard as well as Implement the Design and Construction Services Green Guide for applicable heavy civil projects.
- Support sustainability in tenant construction by updating the Tenant Improvement Handbook.
- Discuss development and enactment of sustainable tenant operations through a Green Tenant Program collaboration.
- Update ground transportation provider "low emission vehicle" requirements for each contract Request for Proposal process.

Policies and contracts present an opportunity to promote sustainability. Policies guide the Aviation Department's business decisions while contracts are the means by which those business decisions are implemented. Integrating sustainability into policies and contracts allows the Aviation Department to coordinate efforts with suppliers, tenants and other business partners.

Accomplishments/Metrics

Commercial Transportation Contract (Air Quality Initiative)

PHX's Trip Fee Program for ground transportation providers servicing Airport passengers is now fully implemented. This results in reduced on-airport vehicle movement and gives a fee reduction for alternative fueled or electric vehicles.



Accomplishments/Metrics (cont.)

Design and Construction Green Guide (Recycling)

Pavement and asphalt recycling during heavy civil airfield rehabilitations has far exceed the 20% goal set in 2015.

Carbon Reduction Policy and Strategy (Greenhouse Gas)

Signed by the Director of Aviation Services, PHX's updated 2020 Carbon Reduction Policy and Strategy describes the commitment to reduce greenhouse gas emissions from airport activities.

Roadmap to Resiliency

During the Sustainability Management Plan Update, staff reviewed several FAA-funded climate and resiliency models and produced an executive summary titled Roadmap to Resiliency with draft recommendations for the Aviation Department to address anticipated local climate change impacts. The document is an initial step on the path forward to mitigate those risks.

Tenant Improvement Handbook

This tenant construction guideline now links to an updated Aviation Department Design Standard, including water and energy efficiency requirements. The Aviation Department Design Standards were updated to require analysis of Total Cost of Ownership during selection of new equipment to keep energy consumption low. The standards are to be adopted.

WHAT'S NEXT

Upcoming initiatives include:

1. **Roadmap to Net Zero Carbon:**
Development of the Roadmap will require development of new internal and external policies and lease requirements, which will be instituted.
2. **Upgrade HVAC and Install Solar:**
Review the use of energy service company (ESCO) contracts for upgrades of energy equipment.
3. **Integrate Total Cost of Ownership into Capital Improvement Project Processes:** Improve new construction contracts by requiring Total Cost of Ownership analysis as part of equipment selection reviews.
4. **Update the Tenant Improvement Handbook:** Formally adopt Aviation Department Design Standards and add a reference to them in the tenant improvement handbook.

Progress Report

Accounting for sustainability during contract renewals with suppliers, tenants and other business partners is currently addressed by contract type.

Opportunities to expand the number and types of contract conditions and policies for a more sustainable airport continue to be explored. For example, the proposed voluntary Green Tenant Program would be the next step to partnering with tenants to achieve common sustainability goals. Information from these initiatives will guide the development of new sustainability policies.



WASTE AND RECYCLING



GOAL

0%
by 2050

The Aviation Department is participating in the City of Phoenix goal of Zero Waste through emphasis on the Circular Economy – use less raw material, reuse & repair before recycling, and procure for longevity.



There is a lot that happens at an airport, much of which results in some sort of waste. Whether it is from passengers grabbing a meal on the go, restaurants and shop owners maintaining inventories, cargo handlers moving goods, or aircraft food service, there is waste to be managed.

With proper sorting and handling, some waste can be recycled or reused rather than being sent to landfills. This creates a cost savings and a way to minimize the impact of airport operations on the environment. All and all, a win-win situation.

Accomplishments/Metrics

The Aviation Department exceeded 40% waste diversion in 2019, a year early of their goal. Diversion rose to 49.4% due to the COVID-19 pandemic bringing significant reductions in operations coupled with increases in online ordering with associated surges in cardboard recycling by cargo operators. Once passenger volumes returned to 2019 levels in 2021, diversion was at 44.4%.

Upgrades to recycling infrastructure, the addition of public facing educational messaging and several pilot programs stemming from the Solid Waste Management Plan are contributing factors to almost doubling the diversion rate in the last 10 years. Further, completion of a GIS database for 580+ collection units between the three airports has allowed the Aviation Department to quantify and track assets for ongoing maintenance, replacement, and rebranding, thus ensuring the ongoing viability of program infrastructure.



Recycling and associated rebates resulted in a positive financial impact of

\$254^K

in fiscal year 2020-2021

Almost double since 2018.



Progress Report

Upgraded Recycling Infrastructure

New larger capacity bins allowing 100% collocated waste and recycle collection were installed throughout all concourses in both terminals. The addition of liquid collection units prior to security checkpoints has reduced contamination of recycling streams, reduced landfill weights and fees, and encouraged reuse of containers.



Recycling Rebates

Since 2017, PHX has actively sought recycling rebates. In 2019, PHX transitioned to a monthly rebate bid process to maximize revenue to offset waste and recycling costs.

Education

Educational messaging was expanded in the PHX terminals by 60% in 2021, including incorporation of messaging on “Recycling Right” to reduce contamination in recycle bins.



WHAT'S NEXT

The United States recycling market is in flux largely due to material quality requirements and the COVID-19 pandemic. Some recyclable materials are in high demand due to reduced raw material availability, but sufficient processing infrastructure is not available in the United States. Future initiatives will focus on the circular economy, source reduction, expanding collection and sale of materials and targeted education messaging.

Upcoming initiatives include:

- Expand Liquid Collection Program:** Replace current liquid collection units and evaluate program expansion opportunities. Focus on refill station initiatives to promote reuse of containers.
- Ongoing Education:** Expand educational content and dissemination through website, social media, videos, e-newsletters, and other methods to promote awareness and best practices.
- Refresh Recycling Infrastructure:** Evaluate options to replace, collocate and integrate waste and recycle units with educational messaging prior to security.
- Food Waste:** Develop and launch a tenant-focused food scrap/compost program and explore public collection options.
- Future Use:** Expand furniture, fixture and equipment reuse program and develop education regarding the circular economy and how reduction and reuse are more sustainable for the environment than recycling alone.
- Green Tenant Program:** Partner with tenants to implement sustainability-related best practices, including waste reduction, reuse and recycling.

WATER CONSERVATION



GOAL

2%

annually

Reduce water consumption by 2%, annually.



A reliable water supply is critical for continued economic growth. Most water used in the City of Phoenix is sourced from rivers, reservoirs and a small amount from groundwater. The Sonoran Desert receives only about eight inches of rain annually. With a total consumption averaging 25 million gallons of water a month, the Aviation Department is aggressively minimizing water consumption at the three airports.

Accomplishments/Metrics

The Aviation Department continues to meet their goal to reduce water consumption annually. As of 2020, water consumption decreased by over 15%, compared to the 2014 baseline year. Guided by a Drought Plan, three milestone projects are conserving millions of gallons of water annually.

15%

reduction since 2014



Terminal 4 Cooling Tower Soft Water Pre-treatment System

This new system halves the amount of cooling tower water used through recirculation. This approach is anticipated to prolong equipment life at Terminal 4 while reducing the use of chemical additives. The upgrade saves more than 22 million gallons of water annually and was recognized with a 2019 Airports Going Green Award - Green Cooling Tower Program. Similar systems have been installed in Terminal 3 and the Rental Car Center.

Xeriscape Landscape

The transition from turf to xeriscape and desert vegetation was completed in 2019, saving more than \$400,000 in labor and materials and more than 5 million gallons of water annually. This project was the catalyst to transition to smart irrigation controllers which check soil moisture and only apply water as needed. The controllers also detect leaks, automatically shutting off and sending a notification.

Building Water Efficiency

Renovation of Terminal 4 restrooms to low-flow fixtures is complete, and procedures to keep these low-flow fixtures in good repair are provided to maintenance staff. The Terminal 3 Modernization Project installed new water fixtures and cooling equipment to these more stringent standards.

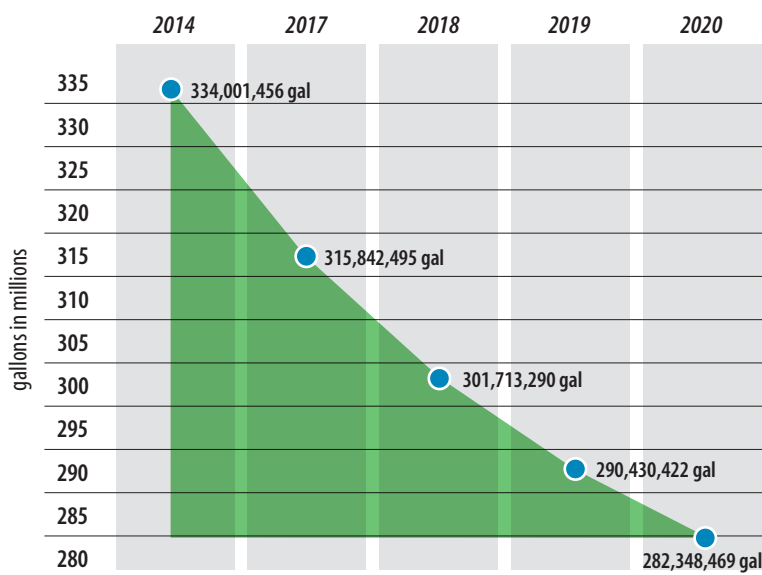


Progress Report

Most airport water consumption occurs as a result of irrigating landscape, circulating water for cooling, and daily use in restrooms and restaurants. Recent efforts to address water consumption in these areas are a success. Led by the Aviation Department Landscape Maintenance, Mechanical Maintenance and Building Maintenance, opportunities for further reductions are being explored.

A water usage GIS program for Phoenix Sky Harbor and Phoenix Deer Valley airports tracks consumption and abnormalities (i.e., leaks). Monitoring usage and then prioritizing water conservation measures based on the GIS information is an efficient use of staff resources. Catching small leaks early allows a timely response without the business disruption of a larger emergency. The database also measures the performance of ongoing water reduction strategies.

PHX Water Usage per Calendar Year



WHAT'S NEXT

Upcoming initiatives include:

1. **Annual Training:** Continue training of Building Maintenance staff on low-flow fixture parts selection during repairs.
2. **44th Street PHX Sky Train Station Cooling System Soft Water Pre-treatment:** Implement a new soft water pre-treatment program for the station. Calculate the amount of water conserved annually.
3. **Ongoing Monitoring of Water Usage:** Continue review of water usage through the GIS program to target improvements that minimize water loss.
4. **Green Tenant Program:** Partner with tenants, particularly restaurants, to implement sustainability-related best practices, including water conservation.
5. **Smart Irrigation:** Complete conversion to smart irrigation controls at PHX by the end of 2022.

Terminal 4 cooling tower upgrades save

More than
22 million

gallons of water annually



