

PHX

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Phoenix Aviation Department Sustainability

A Look Back Before We Take Off!



Director's Message

Phoenix Aviation Department Sustainability is Taking Off!

2017 has been an award-winning year so far. We were recently honored with the American Association of Airport Executive's (AAAE) second annual Airport Innovation Award. This award recognized our involvement in the community, the improvements we've been making to our facilities and the use of cutting-edge technologies to improve our passengers' experience.

We were also recognized by Airports Council International-North America (ACI-NA) for achieving a Level 2 Reduction status in the Airport Carbon Accreditation Program. As you may know, sustainability is important to the City of Phoenix and the Aviation Department. With this, I'm pleased to announce that we are launching the first update to our Airport Sustainability Plan. Over the past several years, our original Sustainability Plan has not only resulted in positive environmental impacts, but has also helped



reduce costs. With your help and the help of our business partners, we already have many achievements to celebrate. We anticipate reducing the amount of water used for landscaping by 46 percent compared to last fiscal year and we increased our recycling rate to 33 percent in 2016. Over the past two years, we decreased our greenhouse gas emissions by 5,450 metric tons through energy conservation measures. We have also partnered with American and Southwest Airlines and received a grant from the FAA to promote conversion of airline diesel equipment to electric. Our new Sustainability Plan Update will allow us to build on our achievements and do even more to reduce our impact on the environment and improve service. We are excited to share with you this compilation of success.

– Jim Bennett, Director of Aviation Services



Introduction

The Aviation Department is well on the way to achieving many of its goals and initiatives from the 2015 Plan. We are excited about the major achievements highlighted in this summary. The current update, *Phoenix Aviation Department Sustainability is Taking Off*, builds on progress and validates objectives. The update aligns the Aviation Department's sustainability strategy with the aviation industry and City of Phoenix's 2050 goals, and embraces ideas inspired by new technology and innovation. There are a number of city-wide goals that the airports can contribute to (see right column).

By developing key performance indicators, the Aviation Department is improving tracking and reporting of all business metrics, which improves understanding of sustainability at the airports.

Though significant progress has been achieved, additional progress can be reached. According to an employee survey conducted for the update, enhancements can be made by creating more specific goals and measuring progress as well as looking for more effective ways to incentivize tenants and accommodate staff and leadership involvement.

This achievement report is organized into the seven focus areas from the 2015 Sustainability Plan—Air Quality, Energy, Greenhouse Gas Emissions, Outreach, Policies and Contracts, Waste and Recycling, and Water Conservation. While this is not a comprehensive reporting on all goals and initiatives, it does highlight major achievements made in each area.

City Goals

1 By 2050, Phoenix will achieve a level of air quality that is healthy for humans and the natural environment.

The Aviation Department's goal for 100% zero-emissions ground support equipment at PHX will help reduce emissions by 2050.

2 Strive for carbon neutrality, with an interim target of 40% greenhouse gas emission reductions by 2025 among all City operations.

The Aviation Department's interim target of 10% reductions by 2020 will help keep the airports on track.

3 By 2050, Phoenix will create zero waste through participation in the "circular economy." In the short term, divert 40% of waste by 2020.

At 33%, Phoenix Sky Harbor International Airport is already well on its way to achieving this target.



Air Quality



Greenhouse Gas Emissions



Energy



Outreach



Policies and Contracts



Waste and Recycling



Water Conservation





Air Quality

Focus Area

Goal: Meet or exceed City of Phoenix Sustainable Fleet Strategy requirements.

Aviation currently has the highest percentage of alternative-fuel use of the City departments (67%) and is considering electric vehicles.

2016 Aviation Vehicle Fuel Use (Gallons)

CNG
660,968

Unleaded
164,789

E-85
81,934

B-20
68,384

Diesel
5,095
Propane
782

Goal: Encourage airline and cargo carrier efforts to reduce ground support equipment (GSE) emissions.

In 2015, PHX received an FAA Voluntary Airport Low Emissions (VALE) grant for \$1 million to develop 28 charging stations for electric GSE at Terminal 4—with the support of Southwest Airlines and American Airlines replacing 68 diesel-powered airline GSE. With the support of SWA and AA, the Aviation Department is aiming for 100% of GSE to be zero-emissions by 2050.



Goal: Continue to incorporate trip fees (a fee imposed on authorized ground transportation providers to pick up a passenger(s) of the Airport) into new ground transportation contracts and implement the trip fee program for all permitted vehicles to reduce air quality impacts, congestion, and help maintain curbside infrastructure.

Trip fees are included in contracts and implemented for all commercial ground transportation providers. The trip fees incentivize ground transportation providers to reduce on-airport movement, and also generate around \$650,000 a month in revenue to improve airport facilities. The trip fees are discounted 10% for alternative-fuel vehicles.

2016 Percent of
Alternative-Fuel Use **67%**





Energy

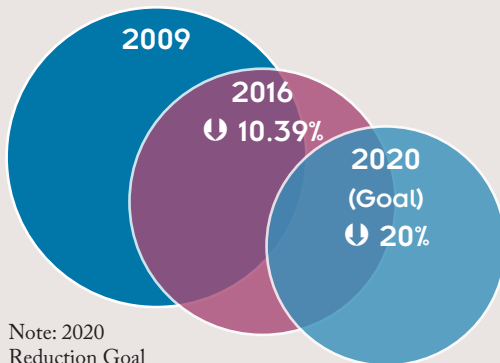
Focus Area

Goal: 20% improvement in energy efficiency of airport facilities by 2020.

Several successful energy-efficiency projects are in place, including ongoing widespread interior and exterior LED lighting conversions. Recommissioning the Terminal 4 building systems in 2018 will ensure that equipment is not wasting energy. New HVAC systems for the Terminal 3 remodel will save energy and improve passenger comfort.

The Aviation Department's Strategic Energy Management Plan lays out the steps toward further energy conservation and conversion to renewables.

Energy usage since 2009



Note: 2020 Reduction Goal is absolute (i.e., addressing total energy consumption rather than on a per passenger basis) and excludes the PHX Sky Train®, which was not in operation in 2009.

LED Cost Savings.

Annual energy savings of more than \$425,400 were achieved from LED lighting conversions in the East Economy Garages, Terminal 4 roadways, curbs and RAC Garage, and Terminal 4 North Concourses. Upcoming LED conversions in the Terminal 4 Garage and Rental Car Center Garage are expected to save an additional \$524,000 per year.

Goal: The Aviation Department is included in the City's goal of using renewable energy sources for 15% of the electricity used by City facilities by 2025.

PHX began its transition to clean energy with 5.4 megawatts of solar photovoltaics at the Rental Car Center and East Economy Parking Garages. To achieve their goal, the Aviation Department will add at least five more megawatts of solar power at PHX to reduce the Airport's dependence on nonrenewable energy sources and offer a zero-emissions alternative. Planned solar sites include solar-covered parking at the Corporate Office Building, New Command Center, 44th Street Parking Lot, and Facilities & Services Building, with additional sites being evaluated.



2016 Calendar Year Energy Use:

145,742,910 kwh
(includes DVT, GYR and PHX but excludes PHX Sky Train®)





Greenhouse Gas Emissions

Focus Area

In 2016, PHX was newly accredited in the Airport Carbon Accreditation (ACA) Program, which is an international program that acknowledges airport efforts to manage and reduce greenhouse gas (GHG) emissions through independent assessment and verification. ACA is the industry standard for measuring and reporting on GHG emissions. PHX entered the program at Level 2—Reduction, which involves mapping emissions, setting a reduction target and policy, and demonstrating progress over time. PHX's Carbon Reduction Policy and Strategy establishes a goal of carbon neutrality for direct and indirect emissions under Airport control by 2050, targeting a 10% reduction by 2020. In addition, the City has since established a 40% reduction goal in City operations by 2025 (using 2005 as the baseline).

In September 2017, the Airport renewed its status in the ACA Program with an 8% reduction in Airport-owned and operated GHGs in just two years. In addition to committing to reducing and tracking GHG, the Airport's Design & Construction Services

Greenhouse Gases



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 currently reporting reductions in GHGs per passenger. This methodology is consistent with many airports.



Division will account for carbon emissions as part of cost estimating and budgeting. The Aviation Department also committed to reporting annually on the avoidance of carbon emissions for new construction.

Business Partners' Efforts

The City of Phoenix Aviation Department can most directly affect reduction of GHGs associated with airport-owned and operated sources, while also encouraging tenants and business partners to decrease emissions. Alaska Airlines serves as a great role model, having reduced its GHG emissions per revenue mile by 35%.

2016 Calendar **4.65** pounds of Year GHGs: **CO₂** per passenger





Outreach

Focus Area

Goal: Develop a plan for community outreach.

Phoenix Sky Harbor International Airport, America's Friendliest Airport®, is active in many outreach programs. In addition to airport tours and speaking to local business and community groups, the Aviation Department is involved in an outreach program for neighboring schools, an eight-week Aviation Academy, and biannual neighborhood cleanups through the Support Sky Harbor Coalition.

Goal: Maintain policies supporting passenger well-being.

The Airport's Irregular Operations Plan is reviewed yearly with airlines and monthly tabletops are conducted to exercise the plan. In addition, an updated stranded passenger program is being established to augment airline programs and provide provisions such as mats, cots, and diapers during mass cancellations or delays.

Goal: Support business partners' sustainability efforts.

The Aviation Department recognizes the important role its business partners play in sustainability. Airline partnerships were leveraged to secure electric GSE charging infrastructure (see Page 3), and the Aviation Department reached out to tenants and ground transportation providers during the development of waste and energy management plans.

Social Media

PHX actively communicates with customers on social media, including Facebook and Twitter, and was recognized by the New York Times for these efforts. By embracing new methods of communication, the Airport provides timely and relevant information and positively interacts with customers. PHX continues to expand social media availability with a plan to add additional after-hours responses.

Business Partners' Sustainability Commitments

A recent tenant survey showed that many business partners have established their own sustainability commitments. For example, several of the concessionaires operating at PHX have a formalized sustainability policy and some have quantitative sustainability goals and/or are reporting on sustainability progress.

PHX August 3

We're launching our Sustainability Plan update – celebrating PHX conservation efforts and building upon our progress. <https://skyharbor.com/About/Sustainability>

Sky Harbor sustainability is taking off!

Landscaping water use down 30% since 2012

[Skyharbor.com/sustainability](https://skyharbor.com/sustainability)





Policies and Contracts

Focus Area

Goal: Implement the DCS Green Guide for applicable civil projects.

The DCS Green Guide was effectively used on the PHX Taxiway C West in-fill project. The Envision rating system is being used for the PHX Sky Train® Stage 2 infrastructure projects. Additional staff education and promotion may be necessary to encourage widespread application of both the DCS Green Guide and Envision.

Goal: Target 20% minimum diversion of demolition and construction waste recycling (for non-LEED projects).

In conjunction with the DCS Green Guide initiative, Staff developed a recycling plan template for contractors and a reporting module for demolition waste diverted from landfills.

Goal: Incorporate sustainability priorities into the Capital Improvement Program ranking process.

Staff proposed updates to the project budget ranking criteria, which were approved and have since been updated. A new process for requesting projects includes a required calculation of the project's net present value, ensuring that the total cost of ownership is accounted for in the ranking process.

Sustainability is integrated into Aviation Department policies and contracts to ensure its principles are considered in decision-making and implementation. The Aviation Department uses the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification requirements for vertical construction projects, maintains a robust training and accreditation program on LEED for staff, and promotes the use of sustainable measures through its Design and Construction Services (DCS) Green Guide for non-LEED projects.

LEED Certification

The PHX Sky Train® takes airport buses off the roads and eases passenger travel, and each completed stage is LEED certified (Stage 1 campus: LEED Gold; Terminal 3 station: LEED Silver). Compared to the baseline, the first three stations of the PHX Sky Train® use 30% less energy. These projects also received awards from Arizona Forward, Airports Going Green, and the Arizona Chapter of U.S. Green Building Council. The final stage is scheduled for completion in 2022 and will connect the terminals to the Rental Car Center.





Waste and Recycling

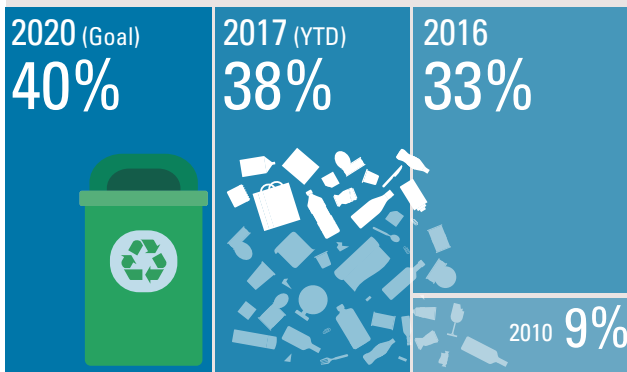
Focus Area

The airports maintain an active waste reduction and recycling program. Recycling bins are stationed throughout PHX; food and beverage, retail, and cargo operators recycle a wide range of materials; and airlines collect and recycle in-plane waste. PHX is advancing the program and working to further engage tenants.

Goal: Achieve 40% waste diversion by 2020 at Phoenix Sky Harbor, Phoenix Deer Valley, and Phoenix Goodyear Airports.

In 2016, PHX's diversion rate—the percent of materials diverted from landfills through recycling—was 33%. Savings from reduced landfill charges and revenue from recycled materials was more than \$100,000. Through August 2017, the year-to-date diversion rate was 38%!

Progress Toward Diversion Goal



Solid Waste Management Plan

The Aviation Department's 2016 Solid Waste Management Plan was developed by documenting current waste management processes and gathering input from tenants and employees. Waste diversion strategies will help the Aviation Department meet and exceed the 40% diversion goal.

Facilities & Services

The Aviation Department's largest division, Facilities and Services, diverts 69% of its waste from landfills, with two office buildings now participating in food scraps and paper towel composting.

Tenant Recycling

The recent tenant survey showed that many of PHX's business partners are committed to waste reduction and diversion. Over 75% of respondents noted that they have already implemented recycling in their operations or have plans in place to do so.

PHX RECYCLES

RECYCLE	COMPOST	LANDFILL
Paper / Cardboard Plastics / Glass Aluminum / Other Metals	Food Coffee Grounds / Filters Paper Towels / Napkins	Plastic Bags / Film Styrofoam Food Wrappers

2016 Calendar Year PHX Waste Diversion: **33%**





Water Conservation

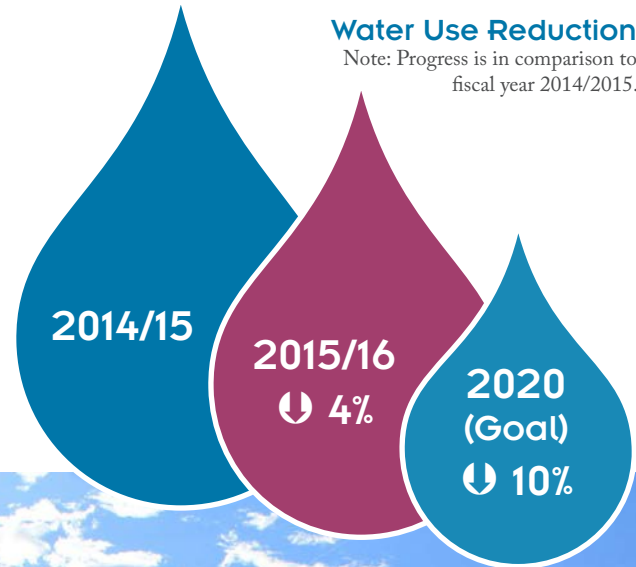
Focus Area

Soft Water Pre-treatment System

The soft water pre-treatment system at Terminal 4's cooling towers has improved water recirculation from 2.5 cycles before dumping to 4 to 6 cycles of concentration. This system also reduces scaling and prolongs equipment life. The Terminal 4 cooling tower system used 7.5 million gallons less water in just four months compared to the previous year, saving \$45,000 so far! This innovative water treatment system contributes to the Airport's water reduction goal and increasing financial sustainability.

Water Use Reduction

Note: Progress is in comparison to fiscal year 2014/2015.



Goal: Reduce water consumption intensity 10% by 2020

PHX used 334,971,181 gallons of water in fiscal year 2014/2015 and 321,778,272 gallons in fiscal year 2015/16. Water conservation projects reduced consumption by 4% as of 2016. Water conservation continues to make progress, especially for landscaping and cooling needs:

- Landscaping—The Aviation Parks Section anticipates a 46% year-over-year reduction in water use for PHX landscaping as compared to fiscal year 2016. Removing turf and completely transitioning to xeriscaping, combined with improved leak monitoring has saved considerable water use.
- Facilities—Public restroom renovations are good opportunities to update to low-flow plumbing fixtures and auto shut-off valves. Building Maintenance staff were trained on low-flow fixture maintenance.



2015/2016 Fiscal Year **321,778,272**
PHX Water Use: **gallons**

