The City of Philadelphia Division of Aviation (DOA) is proud to present its fourth annual Environmental Progress Report, documenting our commitments and progress. The DOA owns and operates both the Philadelphia International Airport (PHL) and Northeast Philadelphia Airport (PNE). As two of the largest economic contributors to the Philadelphia region, PHL and PNE are major assets to our communities and connect people and business to the rest of the world.

It was a busy year for our sustainability program! We continued our focus on the areas of Recycling, Energy, Noise, Emissions, and Water (RENEW); consulted our cross-disciplinary Sustainability Committee; and frequently engaged with stakeholders. We are excited to share the achievements from 2019!

PHL continues to face many challenges on a day-to-day basis that will require greater collaboration moving forward. The recycling market has drastically changed and we – like many airports – are working hard to limit waste going to landfills. PHL is also susceptible to rising sea levels and must prepare for new conditions while minimizing our contribution to climate change. With these challenges in mind, it is increasingly important that we innovate together toward a sustainable, resilient future.

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PHL PROJECTS/INITIATIVES
- Continued pilot of liquid collection stations at checkpoints
- Held a Recycling Round Table with stakeholders
- Held America Recycles Day and Earth Day events
- Replaced exterior and interior lighting with LEDs
- Replaced HVAC units on Terminals B, C, and D
- Celebrated one year of operating an entirely Compressed Natural Gas (CNG) shuttle fleet
- Promoted emission reductions with EV charging stations in short-term parking and economy lot
- Reduced aircraft-related emissions with electric ground support equipment
- Began tracking noise complaint response time
- Continued Fly Quiet Program
- Minimized glycol use in deicing
- Used collected glycol to create biogas at the Philadelphia Water Department Southwest Water Pollution Control Plant
- Selected a wetland mitigation site in FDR Park and completed conceptual design
- Conducted a Climate Vulnerability Assessment

PNE PROJECTS/INITIATIVES
- Issued a request for information for a solar array
- Included geothermal energy in the design of the Administration building renovation
- Prioritized material reuse on the Runway 6-24 Strengthening Project

The following pages highlight this year's progress within the RENEW focus areas, as well as the DOA’s efforts related to sustainable design and construction. Recognizing the importance of looking forward, our “Future Look” section shares a sneak peek at our plans for 2020 and beyond.
Philadelphia International Airport officially marked two decades of recycling in 2019 – though the last two years brought new challenges.

Beginning in 2018, shifts in the level of contamination accepted by the international market caused diversion rates to fall. Further, PHL’s recycling hauler began considering plastic bags used for recycling and their contents contamination. This has led to rejection of most recyclables except for occasional clean loads or particular materials such as cardboard. While we seek solutions, we are taking steps to segregate as much cardboard as possible and emphasizing waste reduction across the Airport.

Contamination refers to non-recyclable materials that cause waste haulers to reject a load of recycling. This includes liquid, food, and non-recyclable materials like Styrofoam and coffee cups.

The diversion rate shows how much waste is kept out of landfills through recycling, donation, composting, or other methods. It is calculated by dividing waste kept out of landfills by total waste.

Waste and Recycling Progress

The three metrics we use to track our program are total generation (waste and recycling), generation per passenger, and the waste diversion rate. Both total generation and generation per passenger have decreased since the 2016 baseline. Despite measures to reduce contamination, the diversion rate has decreased because of the changes in the acceptable contamination rate and rejection of recyclables in plastic bags.

These metrics show that though the diversion rate is low, total waste generated and waste per passenger are decreasing. This indicates success with waste reduction, which is the first step to decreasing our impact on the environment. We are working to improve our diversion rate by reducing contamination in the recycling stream and working towards a solution to the plastic bag problem.
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PHL | PNE 2019 ANNUAL REPORT

32

RECYCLING

Dump Your Drink, Save the Bottle

In 2019, the DOA continued its liquid collection pilot at the Terminal D and E security checkpoints. The pilot started in 2018 after the waste audit found that recycling at checkpoints was comprised of 80% liquid by weight. The new collection units help to reduce liquid contamination and divert liquid waste coming from the checkpoints. The two units have diverted an estimated 13,000 gallons in 2019, saving approximately $4,000 that would have been spent on hauling contaminated recycling.

The collection units also allow passengers to empty bottles before entering security and refill afterwards at over 25 water bottle filling stations. The water bottle filling stations have kept more than 1.7 million plastic water bottles from being used.

Don’t Let Food Go to Waste

Another way to reduce waste going to landfills is to keep materials from ever entering the waste stream. In 2019, MarketPlace Philadelphia, which manages the concessions at PHL, started a food donation program with Philabundance. Unsold nonperishable food items are collected and donated. In 2019, this resulted in 25,690 pounds of donated food, which is equal to 21,400 meals! All unsold food that was previously discarded by merchants at the end of the day is now given to a good cause.

Collaborative Solutions

With the recent changes in the recycling market, it is clear that we cannot work in a vacuum. We engaged our internal stakeholders at the DOA, including departments from Maintenance to Marketing, and major tenants such as MarketPlace and American Airlines, to tackle these issues with our first-ever Recycling Round Table. The event helped us better understand constraints and opportunities across the airport campus.

Engagement Events

The DOA also engaged the public through its annual events held in the terminals on Earth Day and America Recycles Day. Both events included fun and educational games, information from partners like the Philadelphia Water Department and SEPTA, and sustainability-related giveaways like reusable water bottles and utensils. Passengers and employees learned about the innovative environmental projects happening at PHL and received useful tips on green practices.
In 2019, terminal energy use per square foot (referred to as "Energy Use Intensity" or "EUI") increased compared to prior years, returning to our 2016 baseline. This increase may reflect additional energy demand associated with accommodating increased traffic, as well as the DOA's emphasis on electrification. Electrification involves converting equipment from fossil fuels to electricity, which can help reduce emissions. We will hold ourselves accountable to the 20% reduction goal by 2030, and we are actively working to achieve this through energy-efficiency improvements and educating stakeholders on conservation measures.

With the help of federal and state funding, the DOA and airlines at PHL invested in equipment like electric Ground Support Equipment (eGSE) and associated charging infrastructure. Although installed in prior years, use of this equipment and associated energy consumption rise as operations increase and airlines continue to convert GSE to electric models.

The DOA’s 2018 Strategic Energy & Emissions Reduction Plan was put into action in 2019, with major strides in energy efficiency upgrades and steady progress toward on-site renewable energy. As demands for future facility expansion are met, we must continue to focus on driving down both energy use and emissions.

How does electrification impact energy use?
PNE = Integral Part of Our Strategy

Northeast Philadelphia Airport (PNE) is an asset for many reasons, including its contributions to our renewable energy strategy. We are considering renewable energy sources in our planning and design of projects at PNE, such as geothermal and solar. We issued a Request for Information in 2019 for an on-site solar array, and the responses were encouraging. These renewable energy initiatives will serve as a model for other airport projects in the future.

LEDs Still Lighting the Way

Our investment in LED lighting continues to pay off. In 2018, PHL completed Phase I of our LED lighting upgrade program, converting fixtures in the terminal to LED. The project reduced annual energy consumption by 580,000 kilowatt-hours (kWh), equivalent to $38,700 in cost savings. In 2020, PHL will be continuing with Phase II of the LED Upgrade Program, including both interior and exterior fixtures.

Better Measuring for Better Managing

We are fortunate to have an excellent team of energy management experts at PHL, though our capacity to optimize facilities and equipment is still limited by existing sub-metering capabilities. In other words, we cannot narrow down where energy is being used at the Airport to the extent necessary to make real-time decisions or to inform future planning at a granular level. In 2019, we began designing a sub-metering program to address these limitations. Implementation of this program will help us better measure and manage our performance and resources in future years.

Alternative Fuels

We are over a year into operating our Compressed Natural Gas (CNG) shuttle fleet, reducing associated emissions and helping us exceed our goal of 30% reduction in petroleum-based fuel use by 2030.

Focusing on Our Carbon Footprint

Monitoring and managing our Greenhouse Gas (GHG) emissions is an integral part of the DOA’s sustainability program. The generation of GHGs from burning fossil fuels and other processes is a primary cause of climate change, which will directly affect our region. Our ongoing energy efficiency improvements, transition to cleaner fuels, and future renewable energy generation will drive down our overall GHG emissions and slow the rate of change.
NOISE

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We value our community and have a dedicated Airport Noise Office available to assist residents with noise-related concerns. In 2019, we began tracking our response times to better inform future actions. We also identified improvements to better monitor and address noise complaints, which will be implemented in 2020.

Monitoring

PHL has nine permanent noise monitors located in the region that measure noise levels 24 hours a day, 365 days a year. In addition, we offer appropriate portable noise monitoring to surrounding residents at their request. The Airport Noise Office continuously tracks:

- Aircraft operations
- Measured noise levels
- Compliance with noise abatement procedures
- Noise complaints
- Noise complaint response time

In 2019, we began tracking response time to noise complaints to ensure that we are properly serving our community. Our goal is for average noise complaint response time to be under 4 days. In 2019, the average response time was 4.1 days. This year we selected a new system that can automatically enter noise complaints as opposed to the manual system we are currently using. This will be implemented in 2020 and will allow staff to respond to complaints more quickly.

Fly Quiet Program

With the large amount of flight activity in the Philadelphia region, some exposure to aircraft noise is unavoidable. PHL is working to minimize exposure to aircraft noise. The main method for this is the voluntary Fly Quiet Program. This means that from 10:00 PM to 6:00 AM, planes fly down the middle of the Delaware River until they reach sufficient altitude to perform a turn to minimize noise exposure to the surrounding community. This effort keeps departing aircraft further from residential areas while they are at their lowest and loudest. In 2019, voluntary compliance was more than 99% each month!
PHL is continuously working to conserve potable water by lowering our use through our restroom renovation program and using innovative partnerships to protect water quality and maintain regional sources. With PHL physically surrounded by water, we understand and are actively planning for the risks associated with climate change.

Saving Water

Water consumption has decreased in recent years as a result of the conservation efforts established by the DOA. In 2016, approximately six gallons of water were used per passenger. However, by 2019, this shrank to five gallons per passenger, resulting in about a 17% reduction in overall per-passenger use. As shown in the graph on the next page, there was nearly a 10% reduction in total annual water consumption from 2016 to 2019, achieving the DOA’s 2020 goal!

Working with Our Neighbors

We are working with the Philadelphia Water Department (PWD) to treat stormwater runoff and dispose of the deicing fluid (a mixture of glycol and water) used for safe airplane operations in a beneficial manner. Capturing runoff from deicing activities on airport property keeps harmful chemicals, oil, and trash out of the rivers, creeks, and wetlands that surround PHL. The collected deicing fluid contributes to renewable energy production at the Southwest Water Pollution Control Plant.

In 2019, more than 5.5 million gallons of wastewater, which includes stormwater, snow melt, and deicing fluid, were captured and disposed of at the nearby PWD Southwest Water Pollution Control Plant. This year, the wastewater trucked to PWD included a total of more than 300 tons of glycol from deicing operations.

State-of-the-Art Deicing

PHL employs state-of-the-art deicing trucks that are able to minimize the amount of glycol applied during deicing. The trucks are able to take the manufactured deicing fluid, which is 50% glycol, and reduce the concentration based on the temperature at PHL. As a result, the average concentration of glycol used at PHL over the last few years is 42%, which is 16% less than standard. Another benefit of these trucks is that they can move to best target different parts of the aircraft. This allows them to use less fluid overall than our previous stand system.
Wetland Restoration

In recent years, the DOA conducted site searches to identify possible sites for wetland mitigation within the Pennsylvania Coastal Zone. In 2019, we identified a 45-acre site at Franklin Delano Roosevelt (FDR) Park suitable for wetland restoration and developed a conceptual design with community input.

The restoration will create and enhance about 35 acres of tidal wetlands, providing many ecological benefits including sequestering carbon, removing invasive species, and restoring native species that have become rare in Pennsylvania. It will also provide a rare opportunity for environmental education about native habitat restoration within an urban setting.

Preparing for Change

Climate change presents different challenges to airports depending on the region and geographic location, existing assets and infrastructure, connection to the community and other systems, among other factors. One size does not fit all when it comes to planning and preparedness. To help the DOA, a series of Hydrologic and Hydraulics (H&H) studies were conducted for PHL in 2019. The studies looked at on-site stormwater drainage, climate change impacts associated with the Delaware and Schuylkill rivers and their tributaries, and how these could affect PHL.

Making use of the H&H studies, we conducted a Climate Vulnerability Assessment (CVA) to better understand and prepare for the impacts of climate change on PHL’s employees, visitors, services, facilities, and assets. The CVA approach involved the following:

- Investigating climate trends and projections for the Philadelphia region
- Identifying and assessing key vulnerabilities at PHL
- Identifying priority action areas to address vulnerabilities

*Conceptual designs subject to change*
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SUSTAINABLE DESIGN & CONSTRUCTION

Doing the Right Projects – And Doing Projects Right

There were many 2019 projects driven by sustainability – with the objectives of reducing environmental impacts and financial costs while benefiting or protecting our people. Sustainability helped us prioritize initiatives like renewable energy generation at PNE. In addition, we applied the sustainability lens to all projects across the airports to ensure these are done right – reusing materials wherever possible, minimizing fuel use and stormwater runoff, and limiting noise impacts.

PNE Runway Strengthening Done Right

Northeast Philadelphia Airport’s primary runway, Runway 6-24, experienced severe distresses in the asphalt layers and reduced capacity due to poor sub-grade conditions. The pavement was in need of strengthening, but required careful planning and design to avoid operational disruptions, given the important role PNE plays as a reliever airport to PHL. These challenges led to creative solutions that can be applied to future projects at the airports.

The DOA strengthened the existing sub-grade by mixing it with cement to minimize import of materials and expedite the construction process. Mixing was used rather than removing the sub-grade material and replacing it completely to reduce material use. This reuse practice cut hauling trips, saving over $300,000 for the 2019 construction phase, and is expected to save approximately 17,000 gallons of gas for the $7M project. There are two remaining phases scheduled to commence in the spring of 2020, which should yield a net savings of $1.1M and over 50,000 gallons of gas. In addition, this method also reduced the construction duration from six months to under four months.
2020 will look different than we previously imagined as we pivot in the face of new challenges and many unknowns. While certain projects may be paused as we navigate the near term, we are prioritizing the health and safety of our employees and our community. This emphasis on our people is fundamental to our sustainability as an airport enterprise.

Clean air is more important now than ever. Air pollution causes respiratory diseases like asthma and worsens other respiratory diseases. PHL is continuing projects that will benefit the health and safety of our employees and communities by reducing air and water pollution. We remain committed to reducing carbon emissions and energy consumption at both PHL and PNE and to ensuring our facilities and infrastructure are more resilient and adaptable in the event of future crises. In 2020, PHL is looking to expand eGSE charging stations to reduce emissions associated with aircraft handling and services and to add electric vehicle charging stations for DOA fleet vehicles. Furthermore, the wetland restoration at FDR Park is entering the design stage. This project will clean up a blighted natural area and restore its ability to filter pollutants out of water entering the Delaware River.

With surrounding residents in mind, we will improve our noise monitoring program to enable more efficient tracking and responses. Working with our tenants, we will expand the liquid collection pilot to a full-scale program and seek other solutions to the recycling contamination issue. With all that is occurring at PHL and PNE, we also recognize the need for concerted planning efforts around sustainability and climate adaptation and resilience. We will coordinate closely with other planning efforts to align objectives and avoid missed opportunities in our capital development program.

We thank our business partners, customers, and community for your help as we continue the push toward a sustainable and resilient future!