



PHILADELPHIA INTERNATIONAL AIRPORT
NORTHEAST PHILADELPHIA AIRPORT

SUSTAINABILITY

2021 ANNUAL REPORT

INTRODUCTION



I had the great privilege of joining Philadelphia Division of Aviation as Sustainability Manager in 2021. In doing so, I became part of an amazing team and an organization with a firmly rooted commitment to sustainability and resilience. That commitment has never been more important than it was in the challenging years that recently faced our industry. The Division of Aviation, like all airport owners, had to adjust to an unprecedented change in travel demand and new requirements to keep our employees and passengers safe during the COVID-19 pandemic. Although we certainly never expected this course of events, a spirit of resilience enabled us to adapt and continue planning for the future.

We are excited to share our most recent progress on sustainability and resilience with you in this report. The Division of Aviation owns and operates both Philadelphia International Airport (PHL) and Northeast Philadelphia Airport (PNE), and this report provides information about our efforts at both airports during 2020 and 2021.

The Division of Aviation embraces sustainability in our mission to connect Philadelphia with the world, and we seek to lead the airport industry in sustainability and resilience. In support of that mission, since our last update:

- PHL became one of only 23 airports in the country to achieve Level 1 Airport Carbon Accreditation.
- PHL was honored to be one of nine airports invited to participate in the White House Roundtable on Sustainable Aviation, where we provided input to the administration's policies and programs.
- The Division of Aviation was proud to be recognized as a leader at Airports Going Green, a national conference focused on airport sustainability. PHL was awarded an honorable mention in the category of Outstanding Sustainability Program for its tailored approach to integrating sustainability in planning and airport operations and its continued environmental commitment to its stakeholders and larger community.

Looking forward, the Division of Aviation intends to return to annual sustainability reporting to keep our stakeholders informed on our progress. We'll have much to share.

Onward and upward,

Jessica Noon, AICP, LEED-AP, ENV-SP
Sustainability Manager

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PLANNING FOR SUSTAINABILITY

The Division of Aviation is developing a number of innovative plans that will direct the path of growth, sustainability, and resilience at our airports in the coming years.

SUSTAINABILITY MANAGEMENT PLAN

The Sustainability Management Plan (SMP) will bring together past sustainability efforts and planning documents into an actionable roadmap for the Division of Aviation to advance sustainability across the organization. The SMP will include goals, targets, and initiatives developed by a core steering committee made up of a variety of airport stakeholders and a series of working groups each with a focus on a different element of the SMP. Our preliminary focus areas for the SMP are **People & Communities, Clean Energy & Air, Sustainable Materials Selection & Management, Protection of Natural Resources, Safe & Efficient Operations, and Economic Vitality.**



The SMP will tap into the knowledge and insight of Division of Aviation staff and consolidate years of sustainability and environmental planning efforts into a set of vetted strategies. These strategies will enhance and expand our efforts to be a leader in airport sustainability while prioritizing social goals and the long-term fiscal health of the airport.

CLIMATE ADAPTATION AND RESILIENCY PLAN

The Climate Adaptation and Resiliency Plan (CARP) will enable the Division of Aviation to better understand and prepare for the impacts of climate change—including stronger storms, flooding, sea level rise, and high temperatures—on PHL’s employees, visitors, services, facilities, and assets. The plan will identify equipment and infrastructure at PHL at risk to climate change and make recommendations on how to protect those assets and mitigate the effects of climate change on airport property.

PHL MASTER PLAN UPDATE

A master plan is a guiding document for future development. The PHL Master Plan Update will identify key landside and terminal operational or passenger issues that PHL would like to solve while also accounting for the unique opportunities, circumstances, and constraints of the airport. The process will be complete in late 2022 and will incorporate sustainability criteria in the evaluation of alternative scenarios. This focus will ensure that PHL is ready to expand and adapt to meet the needs of the aviation industry for years to come.

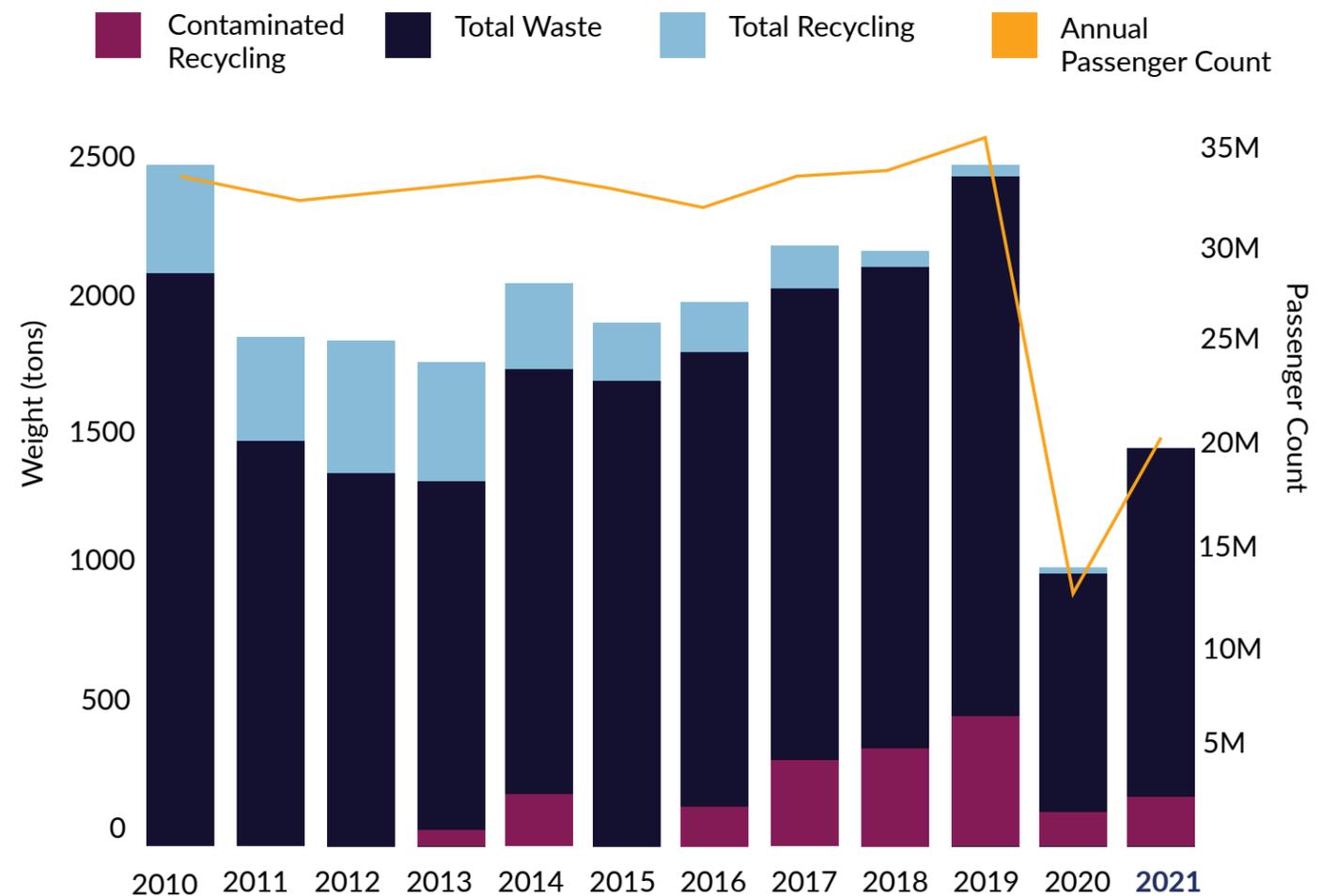
MINIMIZING WASTE

Waste is a challenging issue for airports and is especially complex at PHL, where various entities such as our concessions provider Marketplace, the Division of Aviation, and the airlines all handle their own waste separately. PHL, like many airports, has struggled with contamination in the recycling stream in recent years as the recycling industry has become more stringent. In 2018, our contracted waste hauler began rejecting any recycling from the Airport contained within plastic bags, citing them as a contaminant. Unfortunately, it is not possible with current Airport waste handling facilities for recycling to be removed from plastic bags before being deposited into compactors. As a result, our diversion rate (the amount of recycling material we remove from the waste stream) was at a historic low of 0.3% in 2021.

In December of 2021, the Division of Aviation contracted with a new recycling hauler that has technology to accept and separate waste in clear plastic bags and is able to sort our recycling to manage contamination. With this robust partnership in place and plans for a public awareness campaign on proper recycling for passengers and staff, we hope to significantly reduce contamination of our recycling stream and increase our waste diversion rate in 2022.

RECYCLING AND WASTE

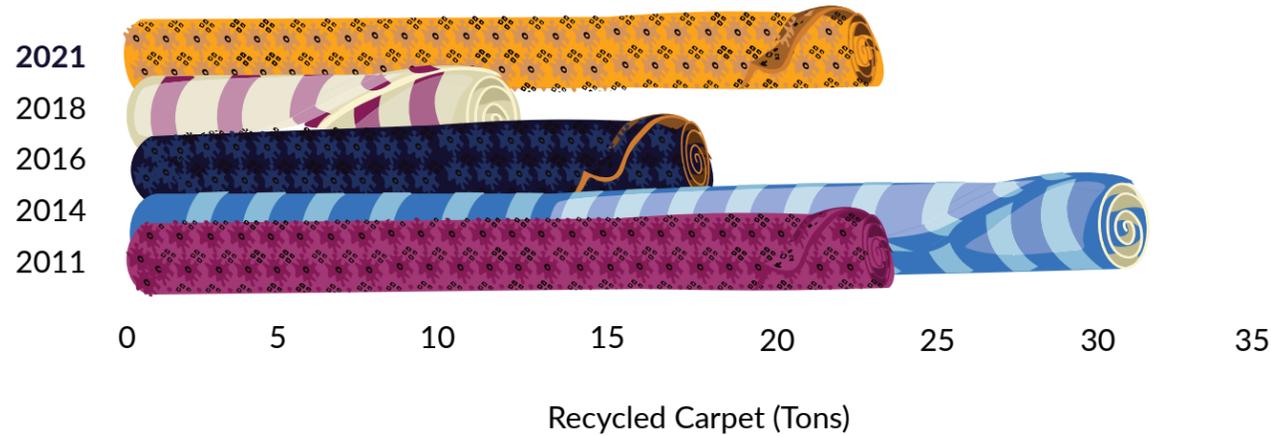
PHL Recycling And Waste Comparison



CARPET RECYCLING PROGRAM

PHL has established a program to recycle carpet replaced in our terminal projects. In 2021, PHL diverted 45 tons of carpet from landfills as part of carpet replacement projects in a number of terminals and pedestrian bridges and in the past 10 years, over 125 tons of airport carpet has been recycled. Although our recycling conversations often focus on cans, bottles, and cardboard, carpet is a particularly important item to recycle due to the chemicals released during the life cycle of carpet when disposed in a landfill.

PHL Recycled Carpet



REDUCING OUR ORGANIC WASTE STREAM

In 2019, MarketPlace PHL started a food donation program with Philabundance, through which unsold food items are collected from concessionaires in the PHL Food & Shops program and donated at the end of each day. This program not only supports our local communities, but it also increases landfill diversion and reduces greenhouse gas (GHG) emissions. Since the inception of its Philabundance Food Rescue initiative, MarketPlace PHL has donated a total of 65,419 pounds of potential food waste to provide 54,516 meals. The reduction of rescued food by weight in 2021 corresponds to lower passenger trips during the pandemic.

MarketPlace PHL Food Donations Metrics				
	2019	2020	2021	Cumulative
# of Pounds Donated	25,691	23,153	16,575	65,419
# of Meals Equivalent	21,409	19,294	13,813	54,516

REDUCING OUR CLIMATE IMPACT

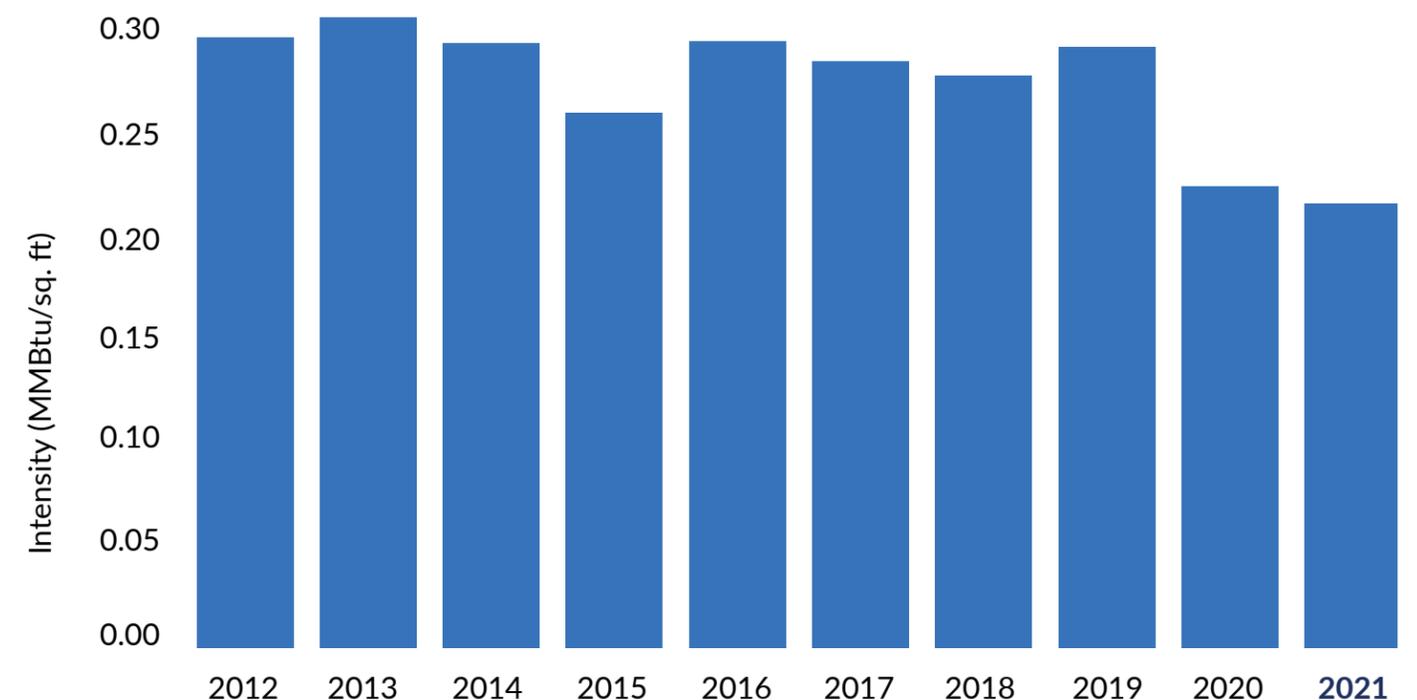
PHL and PNE, like all airports, depend on a reliable energy supply to deliver outstanding service to our customers, tenants, and business partners. Energy and fuel consumption constitute the largest source of GHGs at our airports. With that in mind, the Division of Aviation has taken a multi-faceted approach to reducing energy consumption while transitioning to sustainable energy sources in order to minimize our carbon footprint and improve local air quality.

ENERGY EFFICIENCY UPGRADES

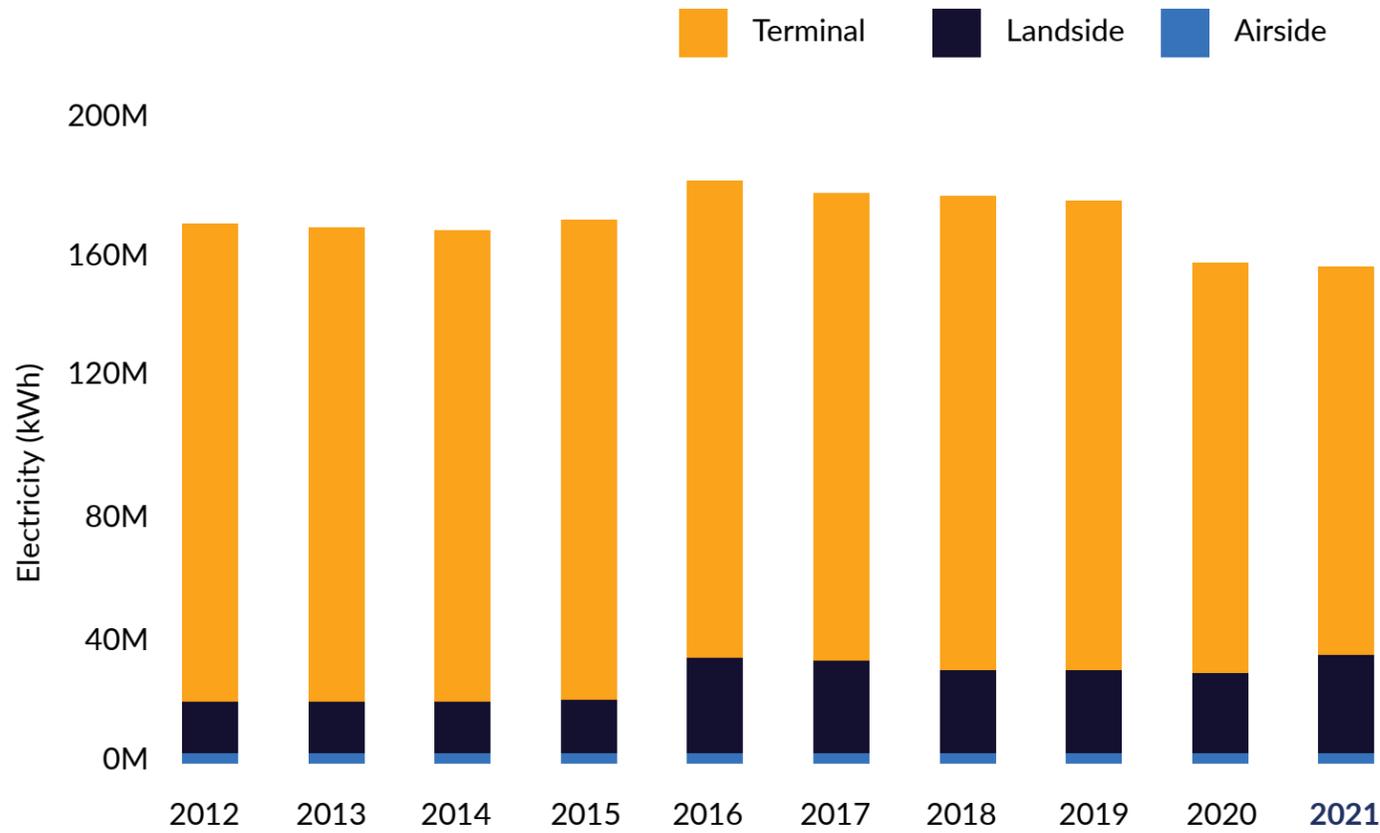
Over the past several years, PHL has implemented several energy efficiency upgrades in terminals and other airport facilities. In 2021, we completed a major project that removed metal halide and halogen lamps and replaced them with 1,606 LED fixtures. This project alone will save 483,010 kWh over the lifetime of the bulbs throughout the terminal complex. Our multi-faceted approach to energy efficiency also included installation of new HVAC units in 2021.

The charts below provide details on our energy consumption. The decline in electricity and natural gas consumption in 2020 and 2021 was driven significantly by pandemic-induced reductions in passenger volume. In particular, there was a significant decrease in the use of electricity in landside buildings, indicating in part the energy-conserving impact of remote work. Regardless, our focus on energy efficiency and alternative fuels continues to drive improvements in our overall energy performance.

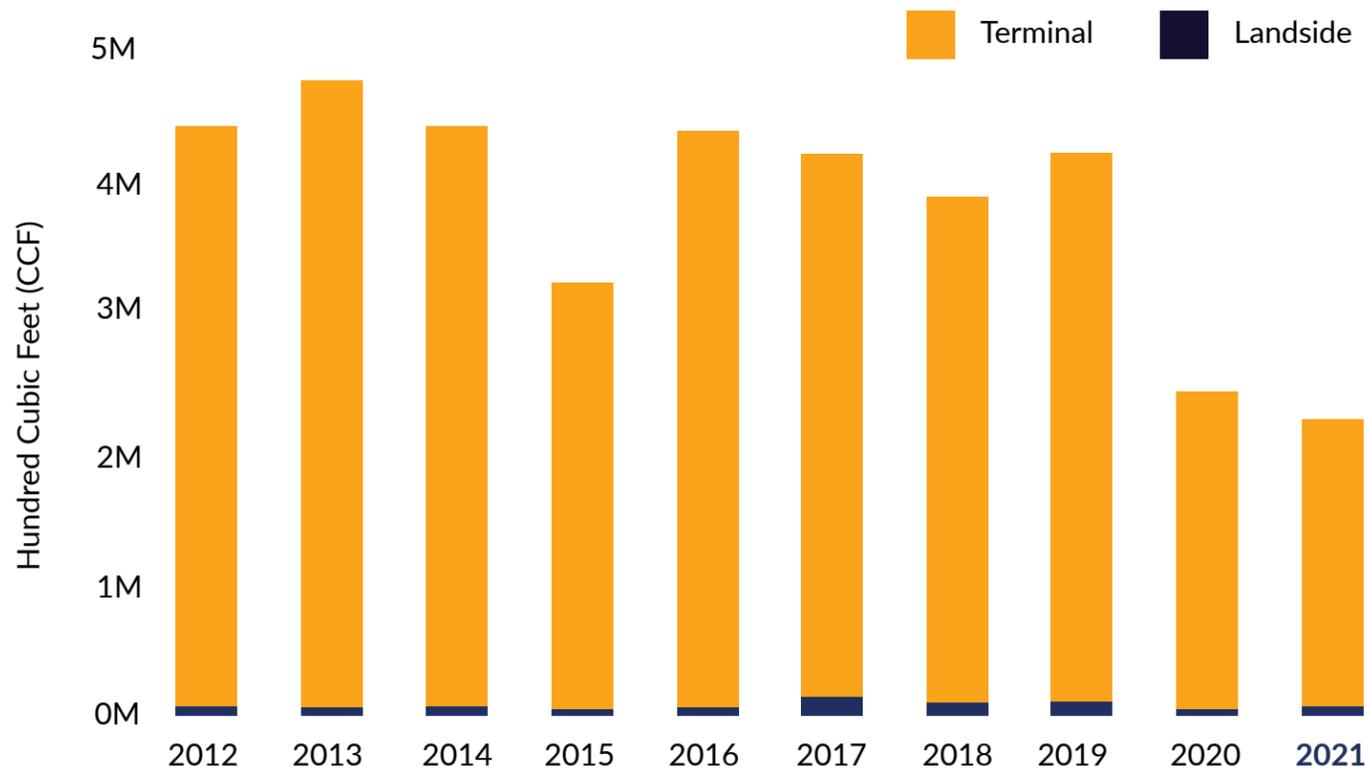
Energy Use Intensity



Electricity Consumption



Natural Gas Consumption



AIRPORT CARBON ACCREDITATION



In 2021, PHL became one of only 23 airports in the country to achieve Airport Carbon Accreditation. PHL's Level 1 accreditation requires mapping and calculating the Airport's annual carbon footprint. In the coming years, the Division of Aviation plans to pursue Level 1 accreditation for PNE while advancing PHL into Level 2, which requires setting targets to reduce emissions and demonstrating carbon reduction. Ultimately, the Division of Aviation aims to align our operations with the City of Philadelphia goal of carbon neutrality by 2050.



PLANNING FOR A SOLAR FUTURE

The Division of Aviation has selected a vendor to enter into a power purchase agreement (PPA) to design, construct, and maintain a nine-acre solar array at PNE. The potential project is currently undergoing design and stakeholder reviews from the City of Philadelphia, our utility PECO, and other appropriate agencies. The solar farm will have the capacity to provide all or most of PNE's electricity from a clean, renewable energy source and will set a precedent for future solar projects at PHL.



REDUCING EMISSIONS FROM VEHICLES & EQUIPMENT



The Division of Aviation has prioritized the use of alternative fuels to reduce emissions, both in our own fleet and by employee and passenger vehicles. In 2021, Division of Aviation use of electric vehicles reduced our gasoline consumption by 1,485 gallons, preventing 12.6 metric tons of carbon dioxide emissions. Our contracted shuttle fleet, which is operated by First Transit and moves employees and passengers between the terminals and various parking lots, was converted to compressed natural gas (CNG) in 2021, reducing greenhouse gas emissions by 20%.

PARTNERING WITH AIRLINES TO IMPROVE AIR QUALITY

Since 2008, PHL has participated in the Federal Aviation Administration (FAA)'s Voluntary Airport Low Emissions (VALE) program to fund low emissions energy projects such as electric ground support equipment (GSE) chargers, and preconditioned air (PCA) and ground power units that enable aircraft to shut down their engines when parked at the gate. These projects have significantly reduced the amount of greenhouse gas emissions and pollutants entering the atmosphere at PHL.



The table below represents emission reductions associated with our recent VALE projects, including electric GSE chargers installed in 2021 and PCA units expected to be operational by 2022.

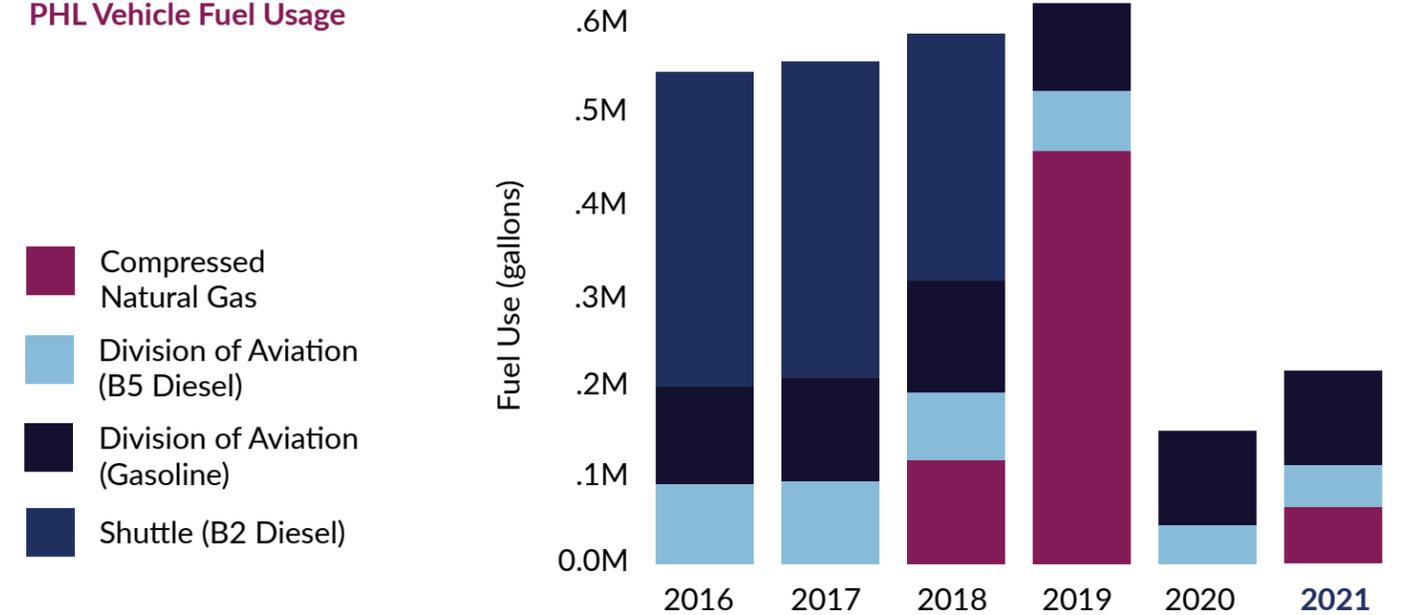
Emission Reductions Achieved from 2019-2021 Air Quality Projects					
	Carbon Monoxide (CO)	Volatile Organic Compounds (VOCs)	Nitrogen Oxides (NOx)	Sulfur Oxides (Sox)	Particulate Matter (PM1.5 & PM10)
Emission Reductions (Tons)	44.4	7.8	124.7	8.4	19.5



In 2021, the Division of Aviation began the development of Vehicle & Equipment Electrification Strategic Plan to further electrify vehicles and equipment at PHL. With groundbreaking innovations in electric vehicles, GSE, and aircraft, the airport industry as a whole is prioritizing electrification and energy diversification. PHL currently offers 14 electric vehicle charging stations in its public parking facilities, and it has electrified 22% of its GSE fleet. Going forward, the Division of Aviation will identify opportunities to further electrify its vehicle fleet, add additional charging infrastructure in public parking areas, and work with tenants to continue the conversion of GSE and other vehicles to electric.

The following chart reflects the fuel usage of vehicles at PHL and includes CNG, bio-diesel (B2 and B5), and gasoline. The temporary closure of our Economy parking lot and remote work policies significantly curtailed vehicle usage across the Division of Aviation during 2020 and 2021.

PHL Vehicle Fuel Usage



DESIGNING FOR SUSTAINABILITY & RESILIENCE

The Division of Aviation prioritizes sustainability and climate resilience in the design and construction of all capital projects, ensuring that as our airports are expanded and renovated, they will become more efficient and prepared for the future.

ENHANCED DESIGN STANDARDS

The Division of Aviation has integrated new goals and requirements for sustainability and resilience into the design standards for capital projects. In 2021, the Division of Aviation posted revised Architectural and Engineering Standards which include the prioritization of LEED (Leadership in Energy and Environmental Design) and Envision certified projects. Stand-alone buildings and major renovations are required to achieve LEED Silver, with a target of Gold or Platinum. Similarly, airfield and landside projects with a cost of \$2 million or greater are targeted to achieve certification via Envision, a rating system for sustainable infrastructure. These design standards will help the Division of Aviation operate in a more efficient and sustainable manner and prioritize long-term design thinking that lowers lifecycle costs.



RESTROOM DESIGN

The Restroom Renovation Program is a multi-year, multi-million-dollar project to modernize all the PHL passenger-facing restrooms and add new janitorial closets. This project will have a significant impact as it aims to transform the guest and employee experience, optimize infrastructure, and build for the future. All new restrooms will include sustainable features such as low-flow water fixtures, LED lighting, low volatile organic compound (VOC) emitting materials, energy recovery ventilators, and dynamic exhaust rates that adjust automatically based on restroom occupancy. During construction, demolition waste will be prioritized for recycling and repurposing.



CONSTRUCTING WITH RECYCLED MATERIALS

The PNE Runway 6-24 rehabilitation project was completed in 2021. The runway was constructed with recycled materials including 20% reclaimed asphalt pavement (known as RAP). Reusing this material enabled the project to reduce petroleum consumption by 50,000 gallons, which would have been utilized to haul in new construction materials. This and other strategies yielded costs savings exceeding \$1 million.



PHL DIVERTS MILLIONS OF GLASS BOTTLES FROM LANDFILL



PHL implemented an industry first in 2021 by integrating a unique, sustainable material into the remain overnight (RON) apron construction project located on the northwest corner of the airport. The project incorporated a combination of recycled on-site materials and ultra-lightweight foamed glass aggregate (UL-FGA) as a subsurface beneath the apron, rather than using a typical substrate product. UL-FGA, a post-consumer material, promotes sustainability in multiple ways, including by diverting waste from landfills, eliminating the need for structural, load-bearing piles, and shortening overall construction time by as much as six months (thus reducing costs and impacts to operations). Approximately 90,000 cubic yards of UL-FGA was used in this project, which is the equivalent of diverting over 80 million glass bottles from the landfill. This project is believed to be the largest application of UL-FGA in North America.

ENGAGING OUR TENANTS



The Division of Aviation partners with our concessions manager, MarketPlace PHL, to encourage tenants to incorporate sustainability into their renovations. Tenants are required to use the LEED rating system to identify opportunities to reduce energy and water consumption and select materials that are recycled or otherwise promote sustainability. All tenant renovations also abide by MarketPlace PHL policy to prioritize recycling of construction and demolition waste. In 2021, two PHL tenant construction projects were completed – Stellar News and Burger King. These projects prioritized reduction of volatile organic compounds (VOCs), reuse of interior construction components, and use of materials with recycled content.

SUSTAINABLE PROFESSIONAL SERVICES

In 2020, the Division of Aviation added specific environmentally-focused selection criteria to our template for procuring professional services. This process promotes the submission of proposals that align with the Division of Aviation's priorities and will result in more sustainably designed and constructed projects.

PRIORITIZING EQUITY

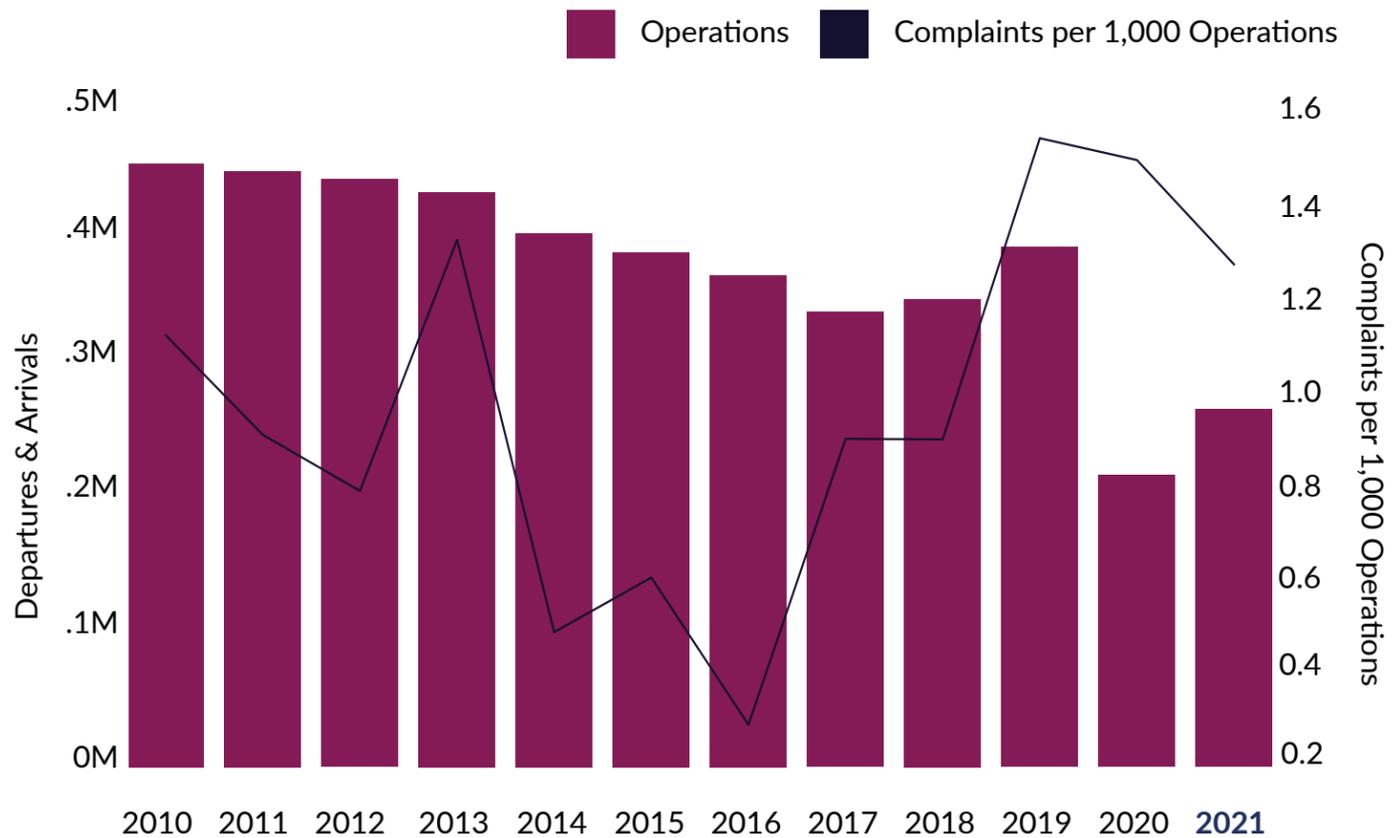
“People First” is the leading principle of the Division of Aviation value statement PRIDE (People, Respect, Integrity, Diversity, Excellence). This means employing a holistic approach with our employees, partners, and stakeholders to prioritize individual well-being and equity. In 2021, we were proud to form a Racial Equity Advisory Council (REAC). This initiative made the Division of Aviation part of the first cohort of City departments to participate in the Citywide Racial Equity Strategy Implementation Plan, which will study and address racial inequities within our organization. REAC made significant progress in its first year, working to support diverse business owners of airport concessions and developing a Racial Equity Assessment, a Workforce Diversity, Equity, and Inclusion Plan, and a Racial Equity Action Plan.



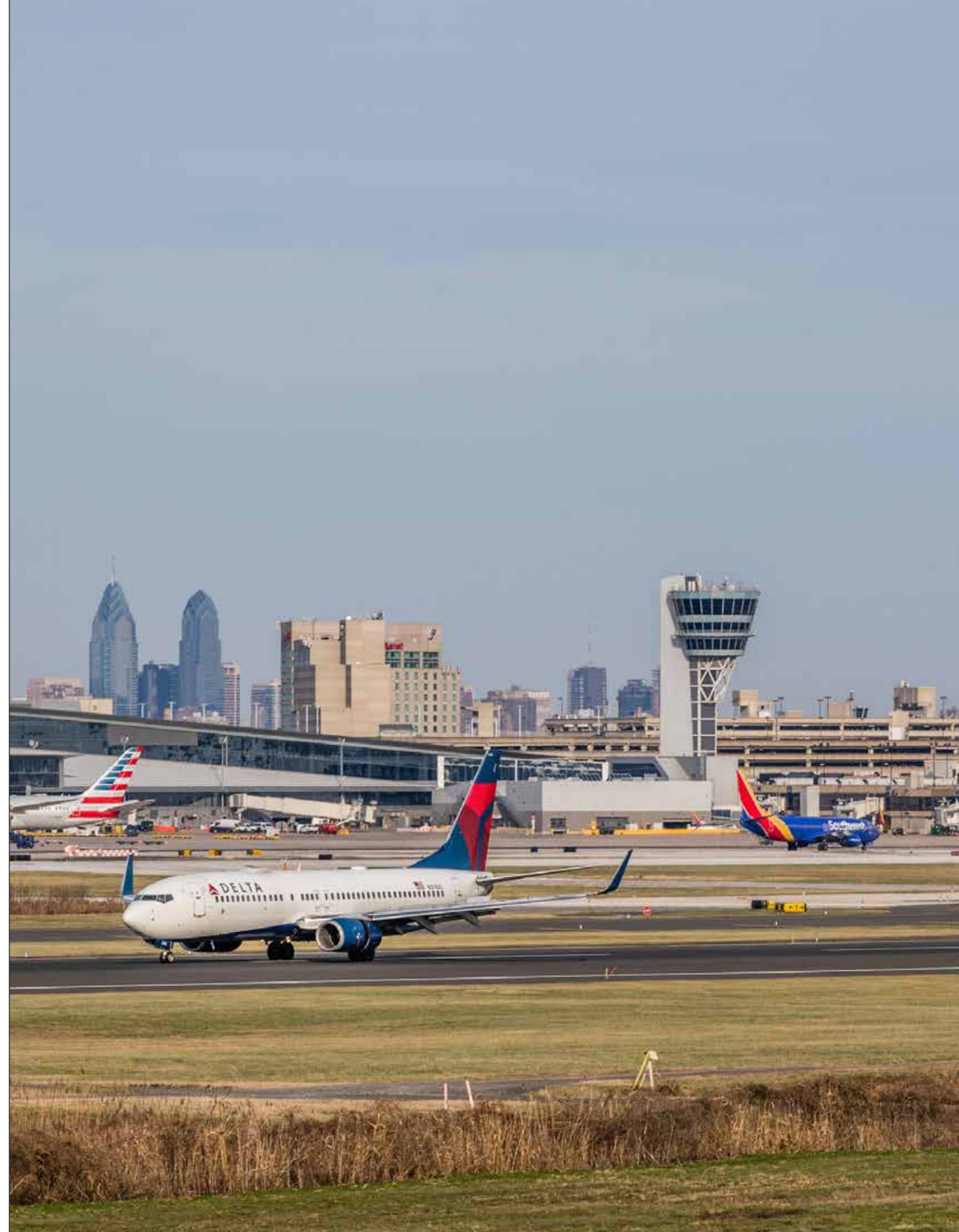
REDUCING NOISE IN OUR COMMUNITIES

The Division of Aviation proactively addresses aviation noise impacts through its Aviation Noise Abatement Program. This initiative promotes coordination and collaboration between the Division of Aviation, the FAA, airlines, and community stakeholders in tracking noise complaints, noise complaint response times, noise levels, and aircraft operations. As a result of process and system improvements in recent years, the Division of Aviation cut its annual average complaint response time by more than 50%, decreasing from 4.1 days in 2019 to 1.9 days in 2021. The Division of Aviation also implements a Fly Quiet Program at PHL, which encourages departure flight patterns that reduce noise impacts to residential areas.

Annual PHL Noise Complaints Per Operation



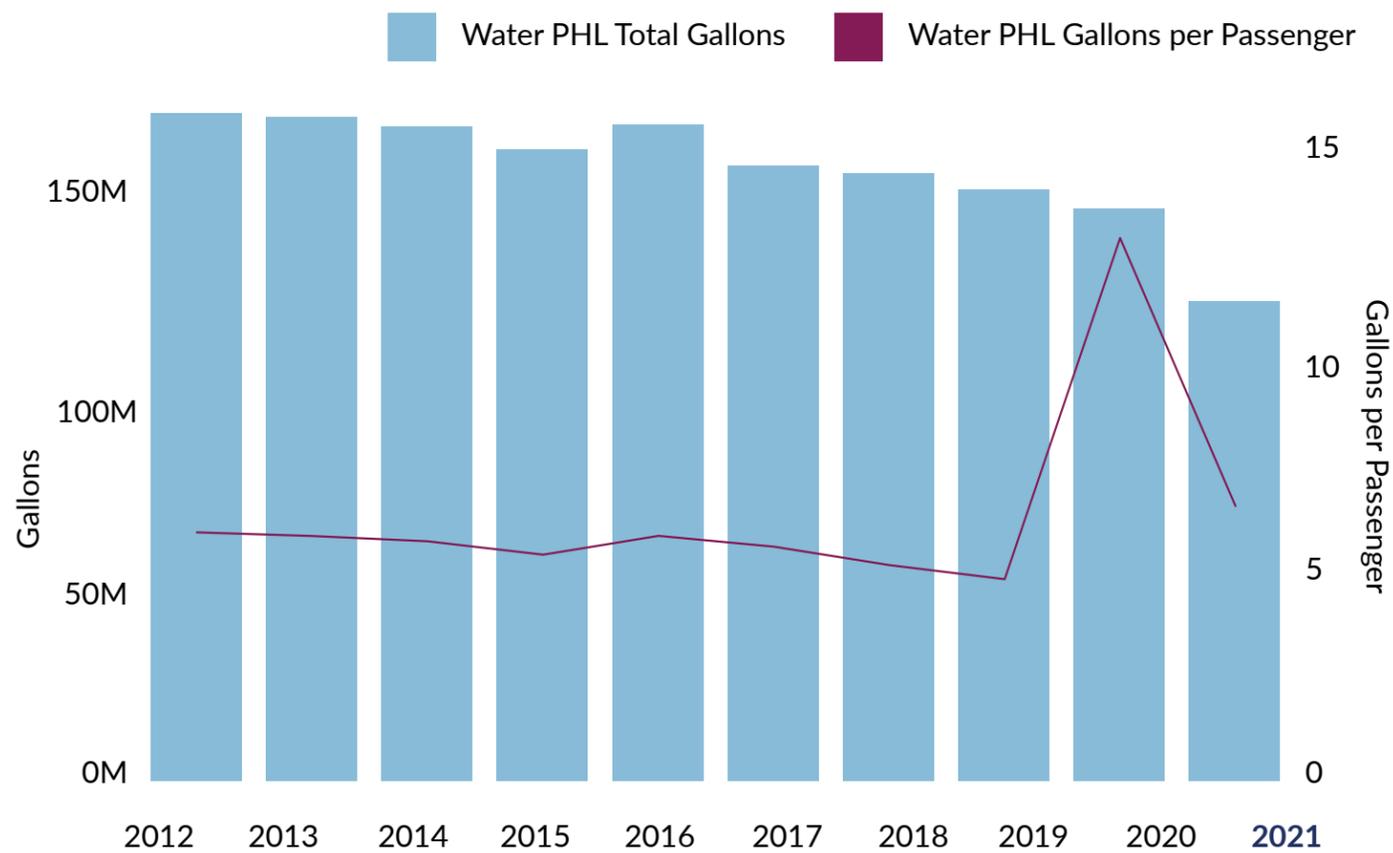
In 2020 and 2021, the Division of Aviation observed elevated noise complaints per 1,000 operations, even while overall operations were significantly lower due to the pandemic. As our neighbors spent more time at home in recent years, the Division of Aviation understands that sensitivity to noise may have been higher than usual. The Division of Aviation plans to continue to improve noise mitigation through innovations in operations, planning, and management, and working closely with local communities to respond to noise impacts.



PROTECTING WATER AND NATURAL RESOURCES IN A CHANGING CLIMATE

The Division of Aviation prioritizes water protection and conservation as we prepare for an ever-changing climate. Since 2016, the Division of Aviation has consistently reduced potable water consumption in our operations, driven in part by investments in water-efficient bathroom fixtures.

Potable Water Consumption



WETLANDS RESTORATION

In partnership with the City of Philadelphia, Philadelphia Parks and Recreation and the Fairmount Park Conservancy, Division of Aviation is participating in the redevelopment of Franklin Delano Roosevelt (FDR) Park by creating 33 acres of tidal wetlands within the park. The project will support the mitigation of wetlands on PHL property that the Division of Aviation plans to develop for cargo operations. The Division of Aviation went above and beyond requirements to ensure that the project was developed as sustainably as possible. The project will retain crushed concrete and 95% of excavated materials on site, helping to reduce unnecessary truck traffic. Access roads were designed to minimize impacts to vegetation, and a climate-resilient plant palette will be utilized. This portion of the park has suffered from disposal of construction debris and other waste for many years – development into wetlands will restore natural drainage patterns and create habitat.

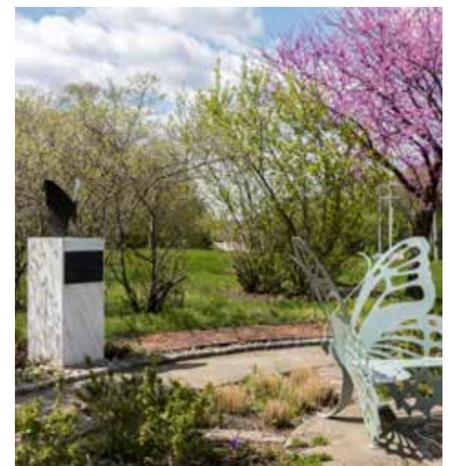


RUNOFF CAPTURE AND PAVEMENT DEICING OVERVIEW

PHL deploys state-of-the-art deicing trucks that minimize the amount of glycol needed for the deicing process, which is critical for the safety of our operations, and ensure safe disposal to protect our local waterways. In 2021, approximately 3.3 million gallons of runoff were captured at the PHL main deicing pad and the commuter area and discharged to the Philadelphia Water Department for treatment. This equates to 62,590 gallons of glycol, or over 270 tons of glycol collected and prevented from entering waterways in our community.

EMPOWERING OUR POLLINATORS

Did you know? PNE is home to a Butterfly Garden that creates a habitat for pollinators, promotes flood mitigation, and beautifies the grounds for staff and visitors. The Butterfly Garden is a memorial garden for children and provides families the opportunity to purchase memorial bricks that become a permanent part of the garden landscape.



WATER BOTTLE FILLING STATIONS



In support of PHL's waste reduction efforts, the Airport's water bottle filling stations continue to provide free and clean drinking water and minimize the need for single-use plastics. From 2019 through 2021, these filling stations helped to divert nearly 2.5 million plastic bottles from landfills.

LOOKING TO THE FUTURE

As the Division of Aviation looks to the future, we are excited about many sustainability opportunities that lay ahead. Throughout 2022, the Division of Aviation will transition from development to execution phases of several critical plans, including the Sustainability Management Plan (SMP), the Climate Adaptation and Resiliency Plan (CARP), and the Vehicle & Equipment Electrification Strategic Plan. We look forward to providing updates on the details of these strategies and plans that will be core to our program. Additionally, we expect to continue pursuing new opportunities to fund our sustainability initiatives, especially those provided through upcoming Bipartisan Infrastructure Law grant opportunities. Finally, the Division of Aviation will continue to strengthen coordination with our stakeholder organizations at all levels, including our local community. Through this increased collaboration and engagement, we aim to create economic and social value while minimizing the environmental footprint of our airports.

