

PHL Master Plan Update

Executive Summary – *Sustainability/Resiliency*

Background

Per the FAA, goals to achieve sustainable airport development include: (1) reducing airport environmental impacts; (2) helping maintain high, stable levels of economic growth; and (3) helping achieve social progress, that is defined by the FAA Airport Sustainability site as a “broad set of actions that ensure organizational goals are achieved in a way that's consistent with the needs and values of the local community”.

In addition to the Airport Master Plan Update, all projects at Philadelphia International Airport (PHL) are expected to follow DOA's Architectural and Engineering Standards, which include sustainable design standards and requirements for LEED, Envision and Parksmart certifications. The sustainable design standards specify energy-efficient, water-efficient, and waste reducing products and practices, and require that all projects be reviewed for the potential to integrate renewable energy production and contribute to the campus-wide stormwater management system. Climate change risk is also required to be calculated and mitigated for all new facilities and major upgrades. DOA's design standards for sustainability and green certification requirements would apply to any future MPU projects for terminals, parking structures, landside projects, or other occupied buildings and significant renovations. Projects should be both individually sustainable and contribute to the overall sustainability of DOA's airports to accomplish the strategic goals of the City of Philadelphia's Department of Aviation (DOA).

The City and DOA have a long history of incorporating sustainability into projects and day-to-day activities at PHL and Northeast Philadelphia Airport (PNE). All projects undertaken by the DOA are expected to follow the sustainable design process, shall be designed with consideration of all aspects of the sustainability program, and will meet the requirements of the City of Philadelphia and the DOA.

Programs and goals

Compliance and Monitoring

DOA is obligated to comply fully with all applicable environmental laws, regulations, and other requirements. This applies primarily to issues of waste management, noise, clean water, and emissions. Airport leadership and staff strive to exceed legal and regulatory standards. DOA develops, monitors, and regularly reviews specific targets for activities and programs that help achieve compliance and improve environmental performance. It holds tenants responsible for compliance with all the applicable laws and statutes regulating their environmental impact.

In addition to Federal, Commonwealth, and City of Philadelphia regulatory compliance, DOA works with policymakers and sustainability practitioners throughout the aviation industry to identify innovative technologies and best management practices for improving sustainability. Where possible, we include airport tenants and other partners in programs that make our operations greener and more efficient.

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Greenworks

The Greenworks program is a broad framework for sustainability within the City of Philadelphia, addressing equity, health, environmental, and economic benefits. PHL and PNE projects must address Greenworks visions throughout their planning, design, and construction. In 2021, the City of Philadelphia committed to achieving carbon neutrality by 2050 in the buildings, energy, transportation, and waste sectors, setting numerous key goals and metrics by sector that are applicable to DOA's facilities and operations. All building projects at PHL and PNE must consider the specific emissions, energy, and waste goals of the City of Philadelphia throughout their planning, design, and construction.

City of Philadelphia Code

All building projects at PHL and PNE must consider the specific emissions, energy, and waste goals of the City of Philadelphia throughout their planning, design, and construction. Findings and recommendations on opportunities for emissions, energy, and waste reduction shall be incorporated into the project process.

- Light Pollution and Energy Saving

Section 16-307 of the Philadelphia Code was amended to require the installation of light-emitting diode (LED) lighting for all lighting purposes in connection with every major renovation or new construction project involving the expenditure of primarily City capital dollars. The code specifies that lighting controls or sensors and LEDs shall be installed for all lighting replacements, upgrades, and new lighting. Where feasible, exterior lighting shall operate on a photocell; occupancy sensors shall be placed on interior lighting; and lighting controls should be integrated into the building automation system.

- City of Philadelphia – Building Energy Performance Policy

In 2021, the City of Philadelphia introduced its innovative Building Energy Performance Policy aimed at promoting efficiency of building energy and water systems to help the region reach its conservation targets and combat climate change. The policy sets ambitious targets for improving performance in both new and existing buildings, while encouraging the adoption of sustainable practices. Since 2022, the PHL Department of Aviation (DOA) has been fully compliant with these regulations, demonstrating a strong commitment to environmental stewardship. The DOA has implemented various energy-efficient measures, such as the installation of LED lighting, use of occupancy sensors, and integration of lighting controls into building automation systems. This proactive approach to sustainable practices contributes to the overall goal of reducing Philadelphia's carbon footprint and creating a more resilient city.

Philadelphia Climate Action Book

In 2021, the City of Philadelphia committed to achieving carbon neutrality by 2050, indicating that it will generate net-zero greenhouse gas (GHG) emissions in the buildings, energy, transportation, and

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waste sectors. To achieve carbon neutrality by 2050, the City has set numerous key goals and metrics by sector that can be sourced in the January 2021 Philadelphia Climate Action Book.

2022 Sustainability Management Plan

The 2022 Sustainability Management Plan (SMP) serves as a comprehensive roadmap for the future of sustainability within the Department of Aviation (DOA) and its airports. Developed through the consolidation of previous plans and strategies, the SMP establishes clear, measurable goals and initiatives that encompass environmental, social, and economic priorities. The plan aims to engage DOA staff and stakeholders, expand the scope of sustainability policies, proactively address environmental concerns, and shift towards a broader definition of sustainability that includes equity, environmental justice, and fiscal stability.

Derived from the SMP, the Sustainability Flight Plan functions as an actionable to-do list, detailing goals, targets, metrics, leadership, priorities, and initiatives. In collaboration with DOA staff, tenants, airlines, and the City of Philadelphia, the DOA has formulated a set of measurable sustainability goals and initiatives organized under five key focus areas: (1) People & Communities, (2) Clean Energy & Air, (3) Waste Management & Sustainable Materials, (4) Natural Resource Protection, and (5) Sustainability Integration. Each initiative has been prioritized based on its impact, cost, technical feasibility, and DOA implementation capacity, ensuring a strategic and innovative approach towards sustainability.

Carbon Neutrality by 2050

In 2022, DOA released a Sustainability Policy Statement in support of the Greenworks pledge to address the climate crisis. “We commit to reducing emissions and minimizing our contribution to climate change, to work towards the ambitious goal of carbon neutrality by 2050, as set by the City of Philadelphia.” To achieve this, the SMP has identified several initiatives under the Clean Energy and Air focus area:

- Energy-efficient lighting systems
- Optimizing heating, ventilation, and air conditioning (HVAC) systems
- Transitioning to renewable energy sources such as solar and wind
- Airport electrification to implement measures to reduce emissions from ground transportation and aircraft operations

These initiatives are analyzed based on impact, cost, technical feasibility, and DOA implementation capacity.

The SMP sets interim targets for energy use, renewable energy, and emissions, which will lead towards fulfillment of the carbon neutrality goal. The airport aims to reduce energy use per passenger by 10% by 2025 and increase the use of renewable energy sources to 20% by 2025. The airport also aims to reduce greenhouse gas emissions per passenger by 30% by 2030.

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Airport Carbon Accreditation

The Airport Carbon Accreditation (ACA) program is a voluntary, worldwide carbon emission management standard of the Airports Council International (ACI World). Each level of accreditation presents a set of criteria to fulfill, as well as a path to carbon neutrality and continued reduction. The program is site-specific, allowing flexibility to consider national or local legal requirements while ensuring that the methodology used is always robust. In 2022, PHL acquired Level 2 Airport Carbon Accreditation, one of only ten airports in North America, by demonstrating reduced carbon emissions over a three year period. DOA plans to continue its carbon emissions reduction efforts and achieve higher levels of accreditation via ACA.

Envision Certification

DOA is the first Philadelphia City agency to adopt the Envision rating system for sustainable infrastructure. This framework promotes sustainability through five principles:

1. Quality of Life
2. Leadership
3. Resource Allocation
4. The Natural World
5. Climate and Resiliency

All airside and landside projects with costs over \$2 million are required to be verified through Envision, with the goal of integrating sustainable design and construction into airport infrastructure projects.

Zero Waste by 2035

The airport aims to reduce the amount of waste generated per passenger by 50% by 2030 and achieve zero waste by 2035. To achieve these targets, the airport will implement various initiatives, including:

- Ongoing waste reduction and diversion through recycling
- Sustainable purchasing practices
- Organic waste diversion through food donation and composting
- Liquid collection and diversion
- Public awareness and education

Department of Aviation Climate Action Resiliency Plan (CARP)

The DOA's climate resiliency planning is conducted through the development of the Climate Action Resiliency Plan (CARP) and preparedness efforts, which run concurrently with the Master Plan Update (MPU) and other initiatives. While CARP focuses on addressing the risks and adaptation strategies for existing assets, the MPU is dedicated to building or renovating new assets. Climate Design Standards are also being developed to ensure future MPU projects adhere to the best practices for climate resilience.

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Sea level rise and increased precipitation have the potential to cause significant flood impacts to PHL during high tides and severe weather events. Vulnerability rankings indicate that sea level rise, storm surge, and related flooding impacts could pose considerable challenges for many existing assets at PHL. These scenarios are crucial for PHL when considering key planning questions, such as the long-term suitability of current asset locations and the siting of new facilities and infrastructure.

Renewable Energy at PHL: As terminals, parking structures, facilities, landside projects and other renovations identified in the MPU are developed, they will be required to consider solar power generation capacity and other renewable energy such as geothermal heating and cooling as per the DOA's sustainable design standards. The DOA is investigating the opportunity for solar energy generation at PHL. DOA aims to incorporate renewable energy in new development whenever feasible, and to

Conclusion

Airport leadership and staff are committed to meeting the needs of the present, without compromising the ability of future generations to meet their own needs. DOA embraces sustainability in its mission to connect Philadelphia with the world, and it seeks to be a leader in sustainability and resilience in the airport industry at a national and international level. With ambitious, yet achievable goals, DOA is committed to integrating sustainability into operations and development at PHL to conserve natural resources, reduce environmental impact, proactively address climate change risks, and invest in the long-term prosperity of our airports.