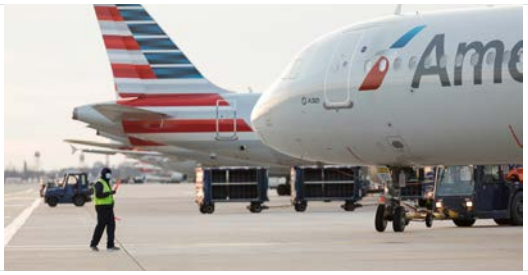

Pennsylvania Transportation Advisory Committee

December 2022

PENNSYLVANIA AVIATION SYSTEM

Strategic Investment Plan

On the cover:

Arnold Palmer Regional Airport
courtesy of Gabe Monzo,
Westmoreland County Airport Authority

Williamsport Regional Airport
courtesy of Casey Bottiger, Michael Baker International

Philadelphia International Airport
courtesy of Philadelphia International Airport

New Garden Flying Field
courtesy of Fran Strouse, TranSystems

DuBois Regional Airport
courtesy of Keith Sisson, Southern Airways Express

Harrisburg International Airport
courtesy of Scott Miller, Susquehanna Area Regional Airport Authority

December 2022

The Honorable Yassmin Gramian, P.E.
Chair, State Transportation Commission
Secretary, Pennsylvania Department of Transportation

Dear Secretary Gramian:

Pennsylvania's aviation system is at a pivotal point in time. The Commonwealth has the opportunity to wisely invest in the system's upkeep and modernization and foster strategic industry collaboration to address opportunities and pressing issues.

Challenges facing the aviation sector in Pennsylvania include:

- The difficult economics of the airline industry, resulting in fewer Pennsylvania airports providing commercial passenger service.
- Development pressures challenging the continued operation of some public-use airports.
- Strong demand for air cargo services and facilities to meet goods movement needs, including e-commerce growth, especially for high-value, time-sensitive items.
- Aviation workforce shortages across many positions and functions.
- Rapid advances in technology and energy, with the pace of change accelerating.

Most technology development will occur through the private sector, yet the public sector—particularly state government—needs to prepare, position, and support aviation's advance, all while maintaining existing facilities.

However, the current glide path of underinvestment in our airports leads toward continued deterioration of aviation assets with the potential to compromise the transportation and economic benefits for our citizens.

Aviation services are provided through a collaboration of the private sector (air carriers, fixed-base operators, and others) and the operators of public-use airports.

courtesy of Philadelphia International Airport

As a statewide advisory body, TAC is uniquely situated to consider aviation in a comprehensive manner and address funding needs and other strategic issues and opportunities. From that vantage point, TAC's approach has been to review the overall statewide system and offer recommendations for investment and strategy aligned with a positive future for aviation in Pennsylvania.

TAC strongly encourages PennDOT and the State Transportation Commission to consider and act upon this report's recommendations. The TAC believes that this report should be the foundation for Pennsylvania's executive and legislative branches to advance a comprehensive aviation agenda over the next five years and beyond, in partnership with private and public aviation stakeholders (we commend the Next Steps section for your review).

We thank the TAC Aviation Task Force that led this study, and appreciate PennDOT's bureaus of Aviation and Fiscal Management for their excellent support of the analysis. Our thanks extend as well to the many aviation stakeholders who participated in regional and statewide listening sessions. The work was challenging and demanding for all involved, yet a necessary investment in aviation's future.

Pennsylvania aviation is ideally positioned for a strategic approach to development and investment guided by partners and stakeholders of the Commonwealth's system of airports. TAC looks forward to seeing the implementation of this work and believes that the timing for takeoff could not be better. Thank you for your support of this study.

Sincerely,

Jody L. Holton, AICP
Co-Chair
Transportation Advisory Committee
Assistant General Manager, SEPTA

Mark Murawski
Co-Chair
Transportation Advisory Committee
Lycoming County Transportation Planner

Note that the terms "aviation facilities" and "airports" are used interchangably in this report, recognizing that there are facilities such as public-use heliports and seaplane bases that are not fixed-wing airports per se.

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Acknowledgments

Transportation Advisory Committee

The Honorable Jody L. Holton, AICP, Co-Chair
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SEPTA

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continued

About the Transportation Advisory Committee

The Pennsylvania Transportation Advisory Committee (TAC) was established in 1970 by Act 120 of the State Legislature, which also created the Pennsylvania Department of Transportation (PennDOT).

TAC has two primary duties. First, it "consults with and advises the State Transportation Commission and the Secretary of Transportation on behalf of all transportation modes in the Commonwealth." In fulfilling this task, TAC assists the Commission and the Secretary "in the determination of goals and the allocation of available resources among and between the alternate modes in the planning, development, and maintenance of programs, and technologies for transportation systems."

TAC's second duty is "to advise the several modes (about) the planning, programs, and goals of the Department and the State Transportation Commission." TAC undertakes in-depth studies on important issues and serves as a liaison between PennDOT and the general public.

TAC consists of the following members: the Secretary of Transportation; the heads (or their designees) of the Department of Agriculture, Department of Education, Department of Community and Economic Development, Public Utility Commission, Department of Environmental Protection, and the Governor's Policy Office; two members of the State House of Representatives; two members of the State Senate; and 18 public members—six appointed by the Governor, six appointed by the President Pro Tempore of the Senate, and six appointed by the Speaker of the House of Representatives.

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Senate Majority Policy Committee

Acronyms

AAC . . . . . Pennsylvania Aviation Advisory Committee
AAM . . . . . Advanced Air Mobility
ACP . . . . . Aviation Council of Pennsylvania
ADO . . . . . Airport District Office (of FAA)
AHZ . . . . . Airport Hazard Zoning
AIP . . . . . Airport Improvement Program
AirTAP . . . . . Airport Technical Assistance Program
ALDZ . . . . . Airport Land Development Zone
ALMP . . . . . Airport Leadership and Management Program
AOPA . . . . . Aircraft Owners and Pilots Association
BIL . . . . . Bipartisan Infrastructure Law
BOA . . . . . Bureau of Aviation (Pennsylvania Department of Transportation)
BTS. . . . . Bureau of Transportation Statistics (USDOT)
CARB . . . . . Community Aviation Revitalization Board (State of Washington)
CBP . . . . . U.S. Customs and Border Protection Agency
CCAP . . . . . County Commissioners Association of PA
DCED . . . . . Pennsylvania Department of Community and Economic Development
DEP . . . . . Pennsylvania Department of Environmental Protection
DGS . . . . . Pennsylvania Department of General Services
DOE . . . . . Pennsylvania Department of Education
EAS . . . . . Essential Air Service
EV. . . . . Electric Vehicle
FAA. . . . . Federal Aviation Administration
FCT. . . . . Federal Contract Tower Program
FMP . . . . . Pennsylvania Freight Movement Plan
FTZ. . . . . Foreign Trade Zone
FY. . . . . Fiscal Year
GA. . . . . General Aviation
GAO . . . . . Government Accountability Office
GAT . . . . . Governor's Action Team
GRP . . . . . Gross Regional Product
HIA . . . . . Harrisburg International Airport
IIJA . . . . . Infrastructure Investment and Jobs Act
KOZ . . . . . Keystone Opportunity Zone
L&I . . . . . Pennsylvania Department of Labor & Industry
LDD . . . . . Local Development District
LNAA . . . . . Lehigh-Northampton Airport Authority
LRTP . . . . . Long-Range Transportation Plan
LTAP. . . . . Local Technical Assistance Program
LVPC . . . . . Lehigh Valley Planning Commission
LVTS. . . . . Lehigh Valley Transportation Study
MAP . . . . . Military Airport Program
MLF . . . . . Motor License Fund

MPC . . . . . Pennsylvania Municipalities Planning Code

MPO . . . . . Metropolitan Planning Organization

MRO . . . . . Maintenance, Repair, and Overhaul (sales tax exemption)

MTF . . . . . Multimodal Transportation Fund

NASAO . . . . . National Association of State Aviation Officials

NBAA . . . . . National Business Aviation Association

NFPA . . . . . National Fire Protection Association

NPE . . . . . Non-Primary Entitlement

NPIAS. . . . . National Plan of Integrated Airport Systems

NREL . . . . . National Renewable Energy Laboratory

P3 . . . . . Public-Private Partnership

PAH-RLF . . . Pennsylvania Airport Hangar Revolving Loan Fund

PEDA . . . . . Pennsylvania Economic Development Association

PEMA . . . . . Pennsylvania Environmental Management Agency

PennDOT . . . Pennsylvania Department of Transportation

PFAS . . . . . Perfluoroalkyl and Polyfluoroalkyl Substances

PFC . . . . . Passenger Facility Charge

PHL. . . . . Philadelphia International Airport

PIB . . . . . Pennsylvania Infrastructure Bank

PML . . . . . Pennsylvania Municipal League

PREP . . . . . Partnerships for Regional Economic Performance

PSATC . . . . . Pennsylvania State Association of Township Commissioners

PSATS . . . . . Pennsylvania State Association of Township Supervisors

PSP . . . . . Pennsylvania State Police

PTC . . . . . Pennsylvania Turnpike Commission

PUC . . . . . Pennsylvania Public Utilities Commission

RBR . . . . . Rapid Bridge Replacement Project

RPO . . . . . Rural Planning Organization

SAF. . . . . Sustainable Aviation Fuel

SARAA . . . . . Susquehanna Area Regional Airport Authority

SBGP . . . . . State Block Grant Program

SCASP . . . . . Small Community Air Service Program

SEPTA . . . . . Southeastern Pennsylvania Transportation Authority

STC . . . . . Pennsylvania State Transportation Commission

STEM . . . . . Science, Technology, Engineering, and Math

TAC. . . . . Pennsylvania Transportation Advisory Committee

TROC . . . . . Transportation Revenue Options Commission

UAM . . . . . Urban Air Mobility

UAS . . . . . Unmanned Aircraft Systems

USDOT . . . . . United States Department of Transportation

VTOL . . . . . Vertical takeoff and landing

courtesy of Philadelphia International Airport

Executive Summary

Pennsylvania's Aviation Funding Gap

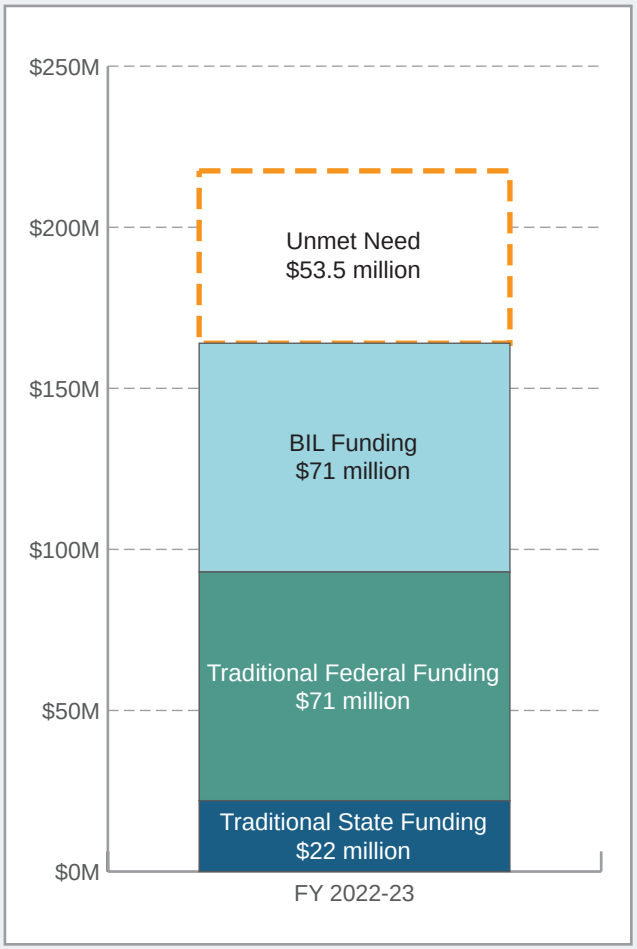
Each year, Pennsylvania's aviation system requires an investment of approximately $217.5 million to keep the state's 121 public-use aviation facilities in a state of good repair and complete basic modernization projects. As shown on the chart to the right, traditional state and federal aviation funding covers less than half of that amount. Funding from the 2021 Bipartisan Infrastructure Law (BIL) addresses a significant portion of that need. However, aviation system needs still exceed total available funding, resulting in a funding gap of approximately $53.5 million.

The unmet need increases each year due to inflation. Further, BIL funding is set to expire in Fiscal Year (FY) 2025-26, which would leave a funding gap of more than $124.5 million if not reauthorized.

The unmet need results in a shortfall at Pennsylvania's 14 commercial service airports as well as its numerous general aviation facilities. The funding shortfall means that airports must defer projects such as runway and taxiway improvements, hangar development, and terminal upgrades. This results in a state aviation system that is less competitive and poorly positioned for future growth (see What's at Stake). As with other transportation modes, failure to make timely improvements compromises system performance and ultimately results in more costly repairs.

It should be noted there are key general aviation airports that relieve congestion at larger commercial facilities. Chester County and Brandywine Airports, for example, provide relief for Philadelphia International Airport. The often overlooked value of these airports must be kept in view as the funding and other recommendations of this report move forward.

PA Aviation System Current Funding and Unmet Need



Note: Current funding amounts are five-year average figures.

Funding Recommendations

TAC's primary objective was to evaluate options for generating additional revenue to close the estimated $53.5 million funding gap and appropriately fund Pennsylvania's aviation assets. Four potential funding scenarios, detailed in Part 1 of this report, were developed as alternatives for generating additional revenue (with annual increases for inflation). TAC recommends Scenario 4, the "Mixed Sources" funding option, described to the right.

TAC recommends this scenario because it includes a blend of traditional aviation sources that, with modest increases, would not overly burden the aviation industry. It also includes a new revenue source—a proposed Package Delivery Fee—which can be directly tied to aviation. A small percentage of the Package Delivery Fee should be allocated for aviation improvement. The Package Delivery Fee is assumed to primarily fund hgihway and bridge needs (see the 2021 Transportation Revenue Options Commission report).

Implementing the recommended scenario will require a concerted policy and legislative effort. Ultimately, the General Assembly and the Governor will decide upon a funding approach for Pennsylvania aviation. TAC underscores that generating an additional $53.5 million per year is the primary priority; the ultimate mix of funding sources to achieve that investment level will be determined by policymakers, who are encouraged to consider the Mixed Sources Funding Scenario as a starting point.

Mixed Sources Funding Scenario

This recommended scenario includes a diverse set of aviation and non-aviation revenue sources to close the $53.5 million funding gap:

- Imposes a new annual **Aircraft Registration Fee** averaging $300 per aircraft.
- Increases the **Jet Fuel Tax** from 2 cents per gallon to 4 cents per gallon.
- Increases the **Avgas Tax** from 6 cents per gallon to 12 cents per gallon.
- Redirects the 6 percent **Aircraft Sales Tax** from the General Fund to aviation.
- Redirects 0.02 percent of the 6 percent **State Sales Tax** from the General Fund to aviation.
- Directs 5 percent of revenue generated from a new **Package Delivery Fee** to aviation.

Strategic Direction Recommendations

The second objective of this study (in addition to the needs and funding analysis) was to analyze trends and issues affecting the aviation industry and propose cohesive statewide strategies for addressing the most significant challenges and opportunities. Issues were organized into eight topic areas:

- Workforce
- Economic Impact/Economic Development
- Airports and Communities/Land Use
- Air Freight
- Commercial Air Service
- Technology
- Industry Collaboration and Partnerships
- Legislation and Policy

Following in-depth analysis and discussions with aviation stakeholders on each topic area, proposed strategies were developed that together form a recommended strategic direction. It is assumed that PennDOT and its Bureau of Aviation would work with other state agencies, regional organizations, and others to determine the various lead and support entities who would be responsible for leading and implementing these strategic actions.

The recommended strategic actions are summarized by topic area on the following pages.

Harrisburg International Airport courtesy of Susquehanna Area Regional Airport Authority

Strategic Actions – Workforce

1. **Implement a comprehensive aviation training and recruitment strategy.**

    a. Work with the Pennsylvania Department of Education (DOE) to offer the Aircraft Owners and Pilots Association (AOPA) High School Aviation STEM Curriculum at Pennsylvania school districts.

    b. Advance aviation and avionics as academic fields of study at Pennsylvania higher-education institutions.

    c. Collaborate with Pennsylvania's network of career and technical centers (CTCs) and industry partners to offer an avionics and aviation curriculum.

    d. Facilitate the development and creation of new flight academies or trade schools throughout Pennsylvania and support existing schools.

    e. Implement a statewide outreach and marketing strategy to encourage interest in an aviation career at all ages, from youth to adults seeking career options.

    f. Enhance existing scholarship or tuition reimbursement programs to support aviation and avionics education and training.

    g. Include the growing Unmanned Aircraft Systems (UAS) industry in training and recruitment strategies.

2. **Support legislative efforts to raise the federal mandatory retirement age for pilots.**

    a. Through the Aviation Council of PA (ACP), advocate for federal legislation to raise the pilot retirement age from 65 to 67. State officials should also communicate their support to Pennsylvania's congressional delegation.

3. **Equip airport managers and authority boards with the tools necessary to proactively preserve and enhance Pennsylvania's airports by improving the quality and efficiency of airport operations and transferring knowledge.**

    a. Develop an Airport Technical Assistance Program (AirTAP) similar to Minnesota's or North Carolina's AirTAP programs. Strongly consider the university partnership model common to both states.

    b. Implement an airport leadership and management certification program to develop a consistent level of core competencies throughout Pennsylvania's airports and recognize airport management experience and leadership, similar to North Carolina's AirTAP Airport Leadership and Management Program (ALMP).

[1] *Avionics* is defined as the science and technology of the development and use of electrical and electronic devices in aviation, or the devices themselves.

Strategic Actions – Economic Impact/Economic Development

1. **Market the value of Pennsylvania airports as an industry and economic asset.**

   a. Develop a marketing profile emphasizing those assets that set Pennsylvania's aviation industry apart, e.g., number of airports, location, transportation connections, economic impact, infrastructure, shovel-ready sites on or near airports, etc.

   b. Formalize assistance among aviation partners (PennDOT's Bureau of Aviation (BOA), the Aviation Council of Pennsylvania, airports); economic development partners such as the PA Department of Community and Economic Development (DCED), Pennsylvania Economic Development Association (PEDA) membership, and Partnerships for Regional Economic Performance (PREP) regions; and tourism promotion agencies to deliver an aviation message, based on the marketing profile, uniformly and consistently throughout Pennsylvania and beyond.

2. **Support existing and develop new incentive programs to encourage economic development at and surrounding Pennsylvania's airports.**

   a. Facilitate implementation of the new Airport Land Development Zone (ALDZ) program.

   b. Develop a public-private partnership (P3) hangar bundling initiative to increase the availability of hangars throughout Pennsylvania. The hangar development program should be developed drawing on the joint expertise of PennDOT's P3 Office and the Bureau of Aviation.

   c. Alternatively, develop a Pennsylvania Airport Hangar Revolving Loan Fund (PAH-RLF) capitalized with a $25 million Commonwealth investment.

   d. Market the use of existing incentive programs at Pennsylvania airports such as Foreign Trade Zones (FTZs) and the Maintenance, Repair, and Overhaul (MRO) sales tax exemption.

Strategic Actions – Airports and Communities/Land Use

1. **Increase compliance with Airport Hazard Zoning (AHZ).[2]**
   a. Document current AHZ compliance.
   b. Develop follow-up outreach to BOA's 2010–2011 outreach campaign.
   c. Brief county and regional planners on AHZ requirements and solicit their assistance in working with municipalities and airports to adopt zoning.
   d. Consider options for requiring airport hazard zoning over a phased-in period of time, e.g., two to three years for compliance. Provide the technical assistance needed in the interim to help bring municipalities into compliance.
   e. Establish recognition programs with high profiling of airports and communities that effectively collaborate in carrying out AHZ and other efforts. Tie this recognition to other actions such as technical assistance.
   f. Consider making AHZ a focus of PennDOT Connects with its emphasis on PennDOT and community collaboration.
   g. Address AHZ compliance with the State Planning Board as a potentially helpful forum for problem-solving and increasing awareness of the need and benefit of AHZ.

2. **Continually monitor land use changes prompted by airports and advance legislative and regulatory changes, as required.**
   a. Work with airports to brief local, county, and regional planners on aviation land use changes. Establish a basic protocol or guide for doing this consistently throughout the Commonwealth.
   b. Identify needed regulatory changes on an ongoing basis and bring to the attention of the State Planning Board.
   c. Advance legislative and regulatory changes on an as-needed basis.

3. **Expand airport manager knowledge on how to effectively work with communities.**
   a. Develop an AirTAP to provide technical assistance for airport managers to improve their planning skills and to work more effectively with communities. Implementing a course similar to NC AirTAP's "Airport Public Relations and Communications," part of its statewide Airport Leadership and Management Program (ALMP) certification, would improve connections between airports and communities.

[2] Airport hazard zoning is a local government planning and zoning tool to control development that could encroach on airport airspace.

Strategic Actions – Air Freight

1. **Assess the local/regional business needs for air cargo services to align businesses with future air cargo opportunities.**

    a. Explore opportunities to deploy Foreign Trade Zones (FTZs) to increase economic investment in air cargo and warehousing near Pennsylvania's airports.

    b. Identify business needs pertaining to aviation in partnership with PA DCED and the state's PREP regions via the Engage! program.

2. **Develop a guide for air cargo analysis and integration with planning application at the state and regional levels.** In developing the guide, determine the various data sources available to better address air cargo as an element of regional and statewide transportation planning. Determine if there are any states to benchmark in this dynamic transportation sector.

3. **Engage aviation stakeholders in the updates of state and regional freight plans and studies to encourage new, collaborative approaches to intermodal connectivity and to foster stronger linkages among cargo, land use, and economic development.**

    a. Evaluate ground access/connections to maximize efficiency and reduce local roadway system impacts.

Strategic Actions – Commercial Air Service

1. **Develop "Fly Local" programs/marketing campaigns throughout Pennsylvania.**
    a. Offer reimbursements for flying local.
    b. Establish a Rural Air Service marketing campaign for communities that are not connected to the national system.
2. **Catalog and share airport flight schedules.**
3. **Include the Commonwealth and local government elected officials in the Essential Air Service (EAS) bidding process to strengthen EAS statewide.**
4. **Ensure the participation of state agencies, community leaders, and legislators in the pursuit of Small Community Air Service Development Program funding.**
5. **Develop a Rural Aviation Subcommittee or Task Force of the Aviation Advisory Committee to provide a voice for airports that serve rural regions.**
6. **Coordinate with and support airports in attracting and retaining commercial air service.**
7. **Incorporate considerations of alternative fuels into future funding and marketing strategies as airlines begin to shift toward alternatively fueled aircraft.**
8. **Conduct a statewide passenger leakage analysis to identify areas/regions/airports that may need additional marketing/retention assistance.**
9. **Prioritize the remaining commercial service airports in the Commonwealth in terms of their long-term essentiality and viability and other factors, and prioritize investment accordingly.**

Strategic Actions – Technology

1. **Plan and prepare for developing the infrastructure needed to deploy alternative fuels such as hybrid-electric and electric-powered aircraft.**
2. **Partner with the Pennsylvania Public Utilities Commission (PUC) and local utilities to develop the electric power capacity to construct charging facilities at airports.**
3. **Monitor developments related to hydrogen-powered aircraft.**
4. **Prepare for Urban Air Mobility and plan for vertical takeoff and landing (VTOL) aircraft.**
    a. Define a statewide protocol for developing vertiports and set aside land to accommodate them.
    b. Involve larger urbanized MPOs in conceptual planning.
5. **Establish or gain licensing for a UAS information and data exchange program to foster public- and private-sector collaboration on research, testing, and deployment.**
6. **Develop policy guidance to assist Pennsylvania's airports in preparing for new and existing commercial/ private-use UAS activity.**
7. **Provide an appropriate level of staffing within PennDOT's Bureau of Aviation for a UAS/Advanced Air Mobility (AAM) manager to facilitate coordination of statewide drone/VTOL initiatives. At a broad level, this growing area of responsibility includes planning, policy development, public safety, and data management.**
8. **Establish a Pennsylvania interagency group (at a minimum including PennDOT, PA Department of Environmental Protection (DEP), PA Department of General Services (DGS), Pennsylvania State Police (PSP), Pennsylvania Turnpike Commission (PTC), and PA Emergency Management Agency (PEMA)) to evaluate existing agency-specific drone programs and uses.**
    a. Explore the value, need, and feasibility of a centralized statewide UAS and AAM program.
9. **Develop a framework for the safe, efficient use of drones and other unmanned aircraft technologies in Pennsylvania.**

Strategic Actions – Industry Collaboration and Partnerships

1. **Improve coordination among airports and Metropolitan Planning Organizations/Rural Planning Organizations (MPOs/RPOs; Planning Partners), Local Development Districts, and other economic development/regional organizations.**

    a. Promote state policy to require or encourage aviation representation as a voting member of MPO/RPO boards, and vice versa on airport boards.

    b. Incorporate aviation topics as part of PennDOT Planning Partners' discussions.

2. **Improve statewide aviation industry partnership and collaboration.**

    a. Develop regular aviation policy and technology briefings to share with partners and various marketing audiences (passengers, businesses).

    b. Formalize interagency protocol among PennDOT, DCED, and other key state agencies.

    c. Encourage Pennsylvania airports to work closely with both county and regional economic development organizations and county and regional planning organizations.

    d. Establish a guide or equivalent resource that identifies the kinds of partnerships and strategic alliances that can be considered with the wide range of organizations listed in Figure 35. Provide training or familiarization sessions with airports and others to promote the use of the partnering guide.

3. **Enhance services to improve an airport's ability to develop effective partnerships, especially rural airports.**

    a. Develop an AirTAP to provide technical assistance for all Pennsylvania airports.

Strategic Actions – Legislation and Policy

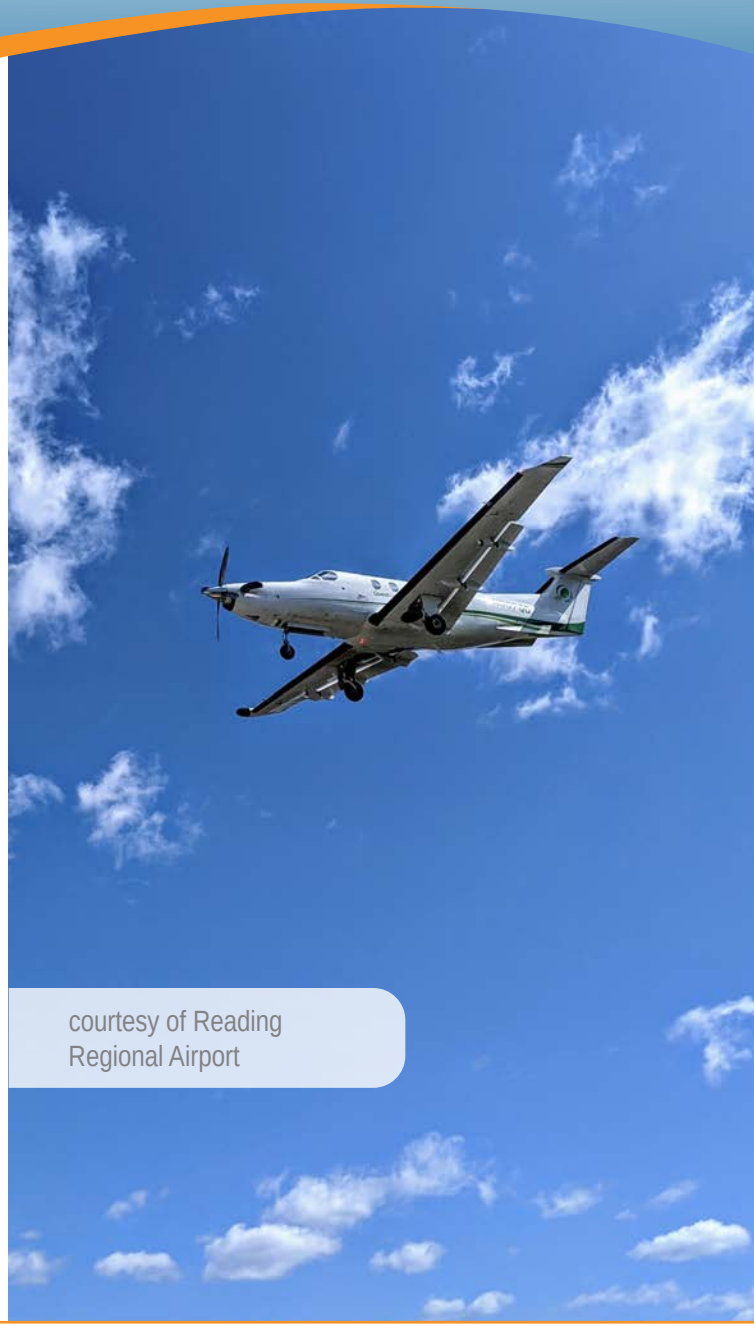
1. **Facilitate passage of legislation and accompanying policies required to implement the funding strategies outlined in Part 1 of this report.**
    a. Impose a new annual Aircraft Registration Fee averaging approximately $300 per aircraft.
    b. Increase the Jet Fuel Tax from 2 cents per gallon to 4 cents per gallon.
    c. Increase the Avgas Tax from 6 cents per gallon to 12 cents per gallon.
    d. Redirect the 6 percent Aircraft Sales Tax from the General Fund to aviation.
    e. Redirect 0.02 percent of the 6 percent State Sales Tax from the General Fund to aviation.
    f. Direct 5 percent of revenue generated from a new Package Delivery Fee to aviation.
2. **On an ongoing basis, consider and as needed advance the passage of aviation-focused land use legislation in conjunction with the Aviation Council of PA.**
    a. Meet regularly with the Senate Aviation Caucus and the House and Senate Transportation Committees.
    b. Obtain input from county planning directors, regional planning organizations, and the economic development community through the Pennsylvania Economic Development Association (PEDA).
    c. Meet with the State Planning Board to advance land use changes required for aviation industry safety and growth.
3. **Advance legislation and corresponding policy to further develop Pennsylvania's UAS and AAM industry.**
4. **Support legislative efforts to raise the federal pilot retirement age from 65 to 67.**
5. **Monitor the outcomes of aviation programs and funding to identify future legislative and policy improvements.**
    a. Assess the effectiveness and impacts for programs and funding sources such as, but not limited to, the MRO sales tax exemption, loss of Essential Air Service subsidies, and future impacts of the ALDZ program.

Methodology and Implementation

This study was guided by a TAC Aviation Task Force led by two TAC members and public- and private-sector representatives. Listening sessions were conducted throughout the state to capture the broad experience and input of Pennsylvania's aviation industry professionals.

The needs and funding portion of the report drew on BOA data with input from Task Force members and PennDOT staff. The analysis and funding scenarios used methodology similar to the 2021 TROC approach.

TAC calls on the Secretary of Transportation and the transportation leaders in the PA House and Senate to use this report as the basis for a strategic reinvestment and refocus for Pennsylvania aviation for the benefit of the state's residents, businesses, and future generations. The Next Steps section recommends the implementation framework.



courtesy of Reading Regional Airport

courtesy of Reading Regional Airport

Introduction

PA Aviation System Challenges and Opportunities

Pennsylvania's aviation system—a network of 121 public-use airports, including 14 commercial-service facilities and small general aviation airports throughout the state—is a vital component of the state's transportation system and economy. The aviation sector delivers an estimated economic impact of approximately $34 billion per year, and supports approximately 226,000 jobs.[2]

In addition to connecting business and leisure travelers to the national and international aviation networks, the state's airports provide an essential connection for high-value, time-sensitive freight. Air cargo demand continues to increase post-pandemic. General aviation airports also serve corporate travel and provide invaluable air traffic congestion relief for larger facilities such as the Philadelphia (PHL) and Pittsburgh (PIT) international airports.

The ability of the state's aviation system to efficiently meet the current and future demand for passenger travel and air cargo services depends upon maintaining airport facilities in a state of good repair, undertaking prudent modernization projects, and pursuing strategic initiatives to prepare for advances in technology.

However, current funding is insufficient to meet those needs.

Pennsylvania's aviation assets are aging, with many airports dating to the 1950s or earlier and requiring investment for continued viability. Without a strategic program of adequate investment, the state's aviation infrastructure will continue to deteriorate faster than it is repaired. Ultimately this could result in reduced services and further airport closures. The failure to keep these facilities in a state of good repair can be expected to result in lost jobs and impeded movement of people and goods, including critical medical supplies that would be urgently affected by a disruption in the air cargo transportation system.

The ability of Pennsylvania's aviation system to efficiently meet the current and future demand for passenger travel and air cargo services depends upon:

- Maintaining airport facilities in a state of good repair;
- Undertaking prudent modernization projects; and
- Pursuing strategic initiatives to prepare for advances in technology.

However, current funding is insufficient to meet those needs.

[2] *Economic Impact of Aviation in Pennsylvania, 2022 Update*

The recent infusion of federal BIL funding is a major step forward; however, it does not fully address Pennsylvania's aviation funding gap, as detailed in the following sections. In fact, for aviation, increased non-federal matching funds are required to receive the new federal funding. The local match requirement can be especially challenging for smaller airports. Further, BIL funding is a significant but temporary measure, set to expire in FY 2025-26.

In addition to properly funding the statewide aviation system, there is a complementary opportunity to develop comprehensive statewide aviation strategies to address issues and challenges impacting this key sector. This is a dynamic time for aviation in areas such as workforce, commercial service, technology, and air freight. Bringing the various stakeholders together around a comprehensive strategy is necessary, timely, and offers tremendous potential.

Keeping airport infrastructure in a state of good repair is a joint responsibility of the federal, state, and local governments (typically airport authorities are comprised of one or more units of local government). State government is a key partner in this intergovernmental structure, as is demonstrated by other states' recent and ongoing investment in aviation infrastructure.

courtesy of Bloomsburg Municipal Airport

Study Purpose and Scope

This study was commissioned recognizing the two overarching challenges facing the Pennsylvania aviation system: the funding gap and the need for an overall public-private aviation strategy that PennDOT and other organizations can advance as collaborating partners.

The Commonwealth (the General Assembly, PennDOT, and other state agencies) is the logical convenor/facilitator for framing a statewide strategy; the Pennsylvania Transportation Advisory Committee (TAC) provides the appropriate perspective for such an analysis. The TAC is an advisory body by its statutory creation that develops findings and recommendations across the wide spectrum of transportation modes, issues, and topics.

This study was prepared to objectively consider the bona fide aviation state funding need and to make recommendations on how the funding gap can be closed. The second purpose for the study was to consider the wide range of aviation issues and opportunities from a statewide perspective in order to make the most of public and private investment in aviation. Part 1 of this report presents an estimate of unmet infrastructure funding needs for Pennsylvania airports and a recommended proposal for systematically meeting those needs to the greatest extent practicable. Part 2 addresses eight strategic themes, listed to the right, that address other aviation issues and opportunities. TAC recognized that evaluating investment along with key strategies will maximize the benefits produced by Pennsylvania's aviation system.

This analysis focuses primarily on the 62 public-use Pennsylvania airports that are generally considered "priority" by the Federal Aviation Administration (FAA) using the federal designation of National Plan of Integrated Airport Systems (NPIAS) airports. It is recognized that the other 59 public-use airports in Pennsylvania provide aviation services that are important to various users. An estimate of needs at non-NPIAS public use airports is also addressed in Part 1 of this report.

Strategic Themes

- Workforce
- Economic Impact/ Economic Development
- Airports and Communities/Land Use
- Air Freight
- Commercial Air Service
- Technology
- Industry Collaboration and Partnerships
- Legislation and Policy

TAC is recommending a comprehensive public-sector strategy for aviation and offers this report as a recommended policy and legislative framework for the near future.

Methodology

The study methodology included the following four integrated elements:

TAC Aviation Task Force

This study was guided by a Task Force. Members included leadership from two TAC members with aviation experience and representatives of PennDOT BOA, airport managers, the FAA, and DCED. A list of Task Force members is presented in the Acknowledgments section. The Task Force collaborated on a regular basis with the consulting team preparing the analysis, in step with the major tasks of the study scope of work. The TAC Aviation Task Force formed an ad hoc subgroup on Aviation Needs Evaluation and Funding to establish the approach, review and analyze the data sources, and offer insights and perspectives regarding the proposed funding scenario.

Issue Identification and Research

In proposing this TAC study, two TAC members identified some 30 PA aviation issues and opportunities needing attention. At the outset of the study, their proposal was summarized into several categories. As the research began, those categories were organized into a series of problem statements and working issue papers. The issue papers in turn became the foundation for regional listening sessions with aviation stakeholders and all ensuing study activity.

Stakeholder Engagement

Eight regional listening sessions (four virtual; four in-person) were held with aviation stakeholders across the Commonwealth to discuss aviation challenges, opportunities, and solutions. The sessions were well-attended with more than 150 participants.

Additionally, a special statewide listening session was convened for General Aviation stakeholders. Other leadership meetings and forums were conducted to vet various aspects of this report in their development.

Needs and Funding Estimation and Analysis

TAC accepted the PennDOT BOA estimate of annual unmet need as a starting point, documented the estimation process, and methodically arrived at a consensus estimate of unmet annual aviation improvement needs for state funding. In conducting this analysis, the TAC has generally followed the methodology used by the Commonwealth's Transportation Revenue Options Commission (TROC) in 2021 (https://www.penndot.pa.gov/about-us/funding/Pages/TROC-Report.aspx).

This approach to evaluating needs and funding options includes:

- Using existing needs estimates from PennDOT data sources.
- Evaluating funding trends over the past decade or longer.
- Examining how other states fund aviation.
- Identifying options for generating revenue, including present and new potential revenue sources.
- Evaluating several revenue scenarios, then proposing one scenario for enactment and implementation.

The study Task Force considered whether the estimated need reflects the proper balance between system preservation and aviation facility growth or expansion. Keeping the system in a state of good repair is top priority. As policymakers consider the funding approach, the matter of preservation as compared to growth and development could be considered.

courtesy of Philadelphia International Airport

courtesy of Williamsport Regional Airport

Part 1: Closing the Aviation Funding Gap

PA Total Annual Aviation Funding Need

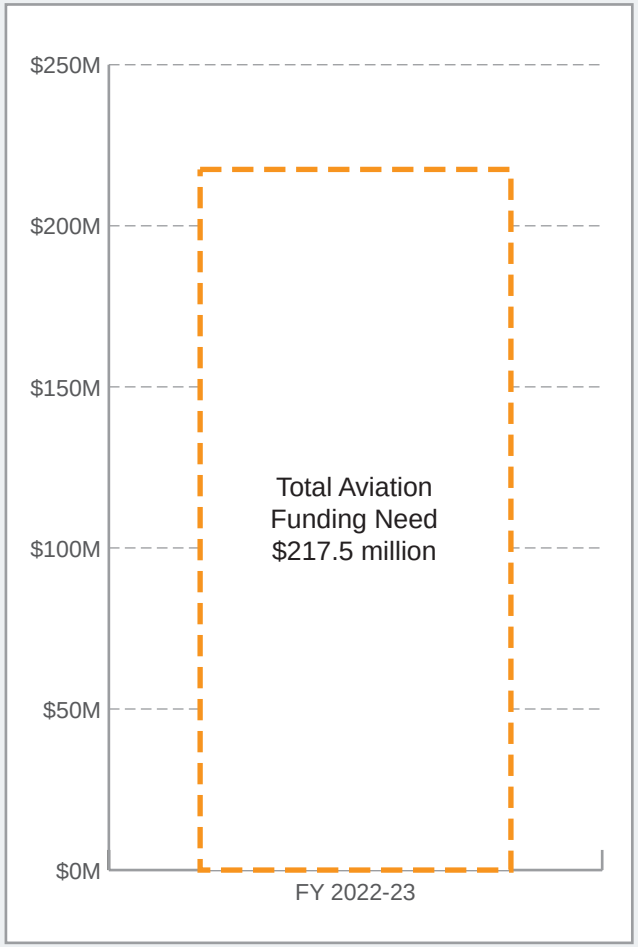
Each year, Pennsylvania's aviation system requires an investment of approximately $217.5 million in order to keep the state's public-use airports in a state of good repair and complete basic modernization projects. As of December 2022, there are 121 public-use airports in Pennsylvania. The total funding requirement is depicted in Figure 1 and the breakdown by spending category and airport type is shown in Figure 2.

Figure 2: Total Estimated Need by Category

Aviation Investment Category	Total Annual Amount Needed
Commercial Service Airports (14)	$137,700,000
FAA-Administered General Aviation Airports (8)	$17,500,000
Block Grant Aviation Facilities (40)	$35,800,000
Public-Use Non-NPIAS Aviation Facilities (59)	$8,000,000
Statewide Hangar Development	$5,000,000
Other – Secretary's Discretionary Fund, Emergency Projects, etc.	$5,000,000
Emerging Aviation Technology Initiatives	$8,500,000
TOTAL (121 Public-Use Aviation Facilities)	$217,500,000

Throughout the analysis, TAC emphasized the importance of distinguishing between "needs" and "wants."

Figure 1: Pennsylvania's Total Annual Aviation Funding Need



Aviation investment funding is used for primarily for capital projects such as runway improvements, taxiways, hangar development, terminal upgrades, airport roadways, fueling facilities, etc.

Airport operations costs are not included in this needs analysis but are recognized as being essential and generally the responsibility of the local airport operator. Various recommendations in Part 2 of this report are aimed at capitalizing on opportunities to generate new revenue for operations. These include using airports as a location for energy generation (e.g., electric vehicle charging stations, solar, etc.) and promoting partnerships that could enhance airport operational profitability. Whereas PennDOT and other states have historically provided funding to support public transportation operating costs, that has not been so for aviation. The appropriate state role should remain as primarily that of investing in aviation infrastructure rather than airport operations.

Funding and revenue projections must also consider the impact of inflation on aviation infrastructure investment. This report uses a 5 percent estimated annual inflation rate, which was also used in the 2021 TROC analysis.

courtesy of Brian Funkhouser, Michael Baker International

Current and Historical Aviation Funding

Current Funding

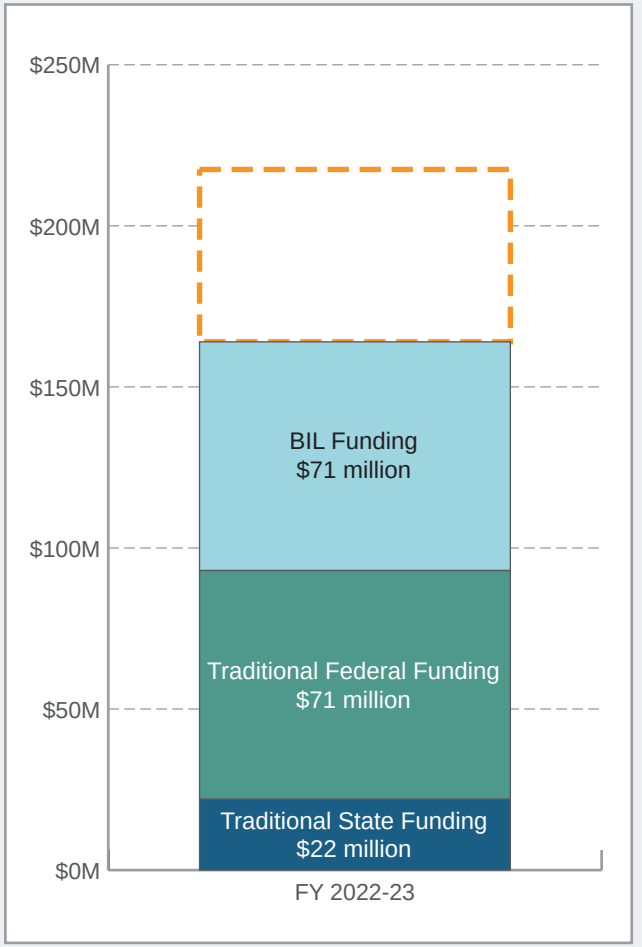
As shown on Figure 3, traditional state and federal funding totals approximately $93 million per year. Funding from the Bipartisan Infrastructure Law doubles the amount of federal funding per year, but only through FY 2025-26 unless reauthorized. The available funding is allocated as indicated in Figure 4.

Figure 4: Current Federal and State Funding Allocation

Aviation Investment Category (# of airports)	Total Annual Amount Needed	Total Annual Amount Funded
Commercial Service Airports (14)	$137,700,000	$121,700,000
FAA-Administered General Aviation Airports (8)	$17,500,000	$13,500,000
Block Grant Aviation Facilities (40)	$35,800,000	$25,100,000
Public-Use Non-NPIAS Aviation Facilities (59)	$8,000,000	$3,700,000
Statewide Hangar Development	$5,000,000	$0
Other – Secretary's Discretionary Fund, Emergency Projects, etc.	$5,000,000	$0
Emerging Aviation Technology Initiatives	$8,500,000	$0
TOTAL (121 Public-Use Aviation Facilities)	$217,500,000	$164,000,000

Note: Current funding amounts are five-year average figures.

Figure 3: Current Aviation Funding Amounts

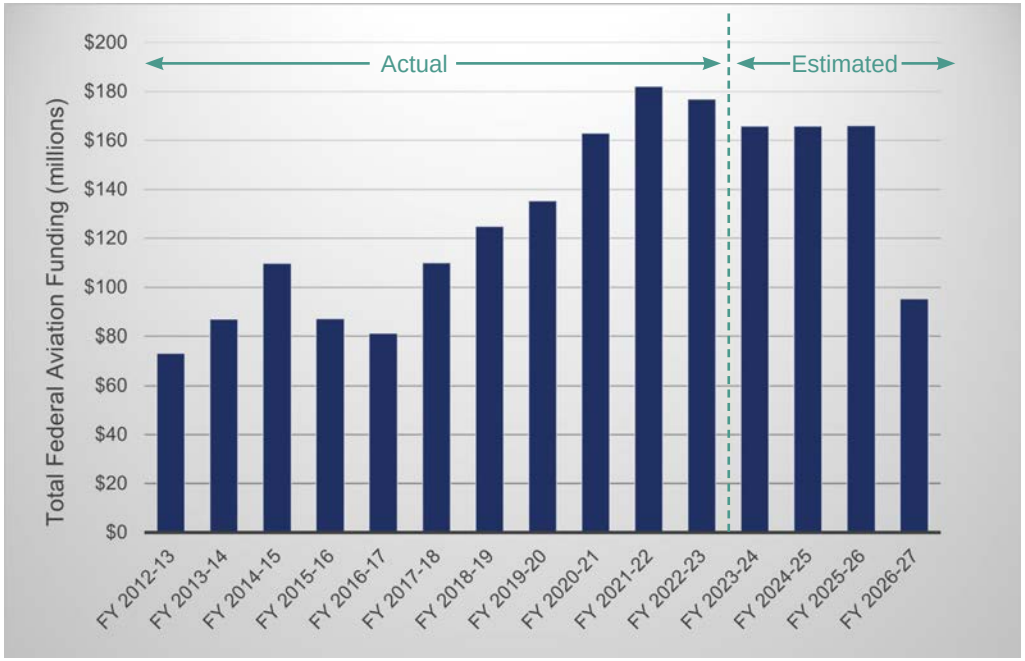


Note: Current funding amounts are five-year averages.

Aviation Funding History and Forecasts

Funding for Pennsylvania's aviation system has remained stable over the past decade, with an increase in 2020 (Figure 5). Under the assumptions of no increases in state funding mechanisms and an annual, flat-rate allocation for aviation through BIL, Pennsylvania's annual aviation funding can be expected to remain steady at approximately $164 million through FY 2025-26. After BIL funding expires, total federal funding—absent any Congressional action to extend the funding levels—would fall to approximately half the current amount.

Figure 5: Total Aviation Funding in PA, FY 2012-13 through FY 2026-27



After BIL funding expires in FY 2025-26, total federal funding—absent any Congressional action to extend the funding levels—would plunge back down to approximately half the current amount.

Source: FAA AIP Grant History Visualization Tool (fiscal years 2012-2021) and FAA FY 2022 grant announcements; PennDOT Bureau of Fiscal Management

Federal Aviation Funding Sources

Between 2012 and 2015, federal funding sources made up more than 70 percent of Pennsylvania's aviation funding. This share increased to nearly 90 percent in 2020 because of special funding in response to the COVID-19 pandemic.

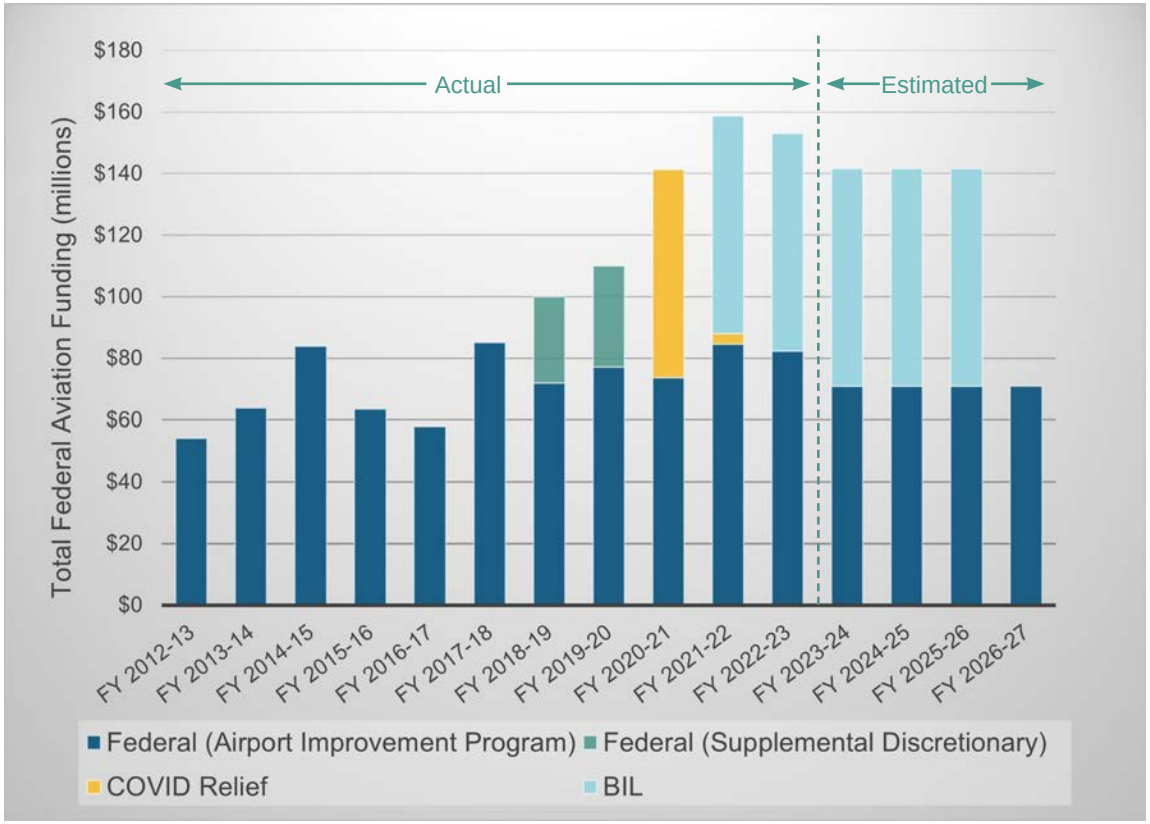
When the pandemic began to severely impact the U.S. in early 2020, federal COVID relief funding was made available to airports in Pennsylvania and across the nation. The funding allowed the state's airports to continue operations and provide critical services, such as cargo handling and medical transport. For FY 2020, relief funding made up a 35 percent share ($67.6 million) of Pennsylvania's total aviation funding. Although COVID relief was also part of Pennsylvania's aviation funding portfolio in FY 2021, it comprised a much smaller share of just 2 percent ($3.5 million). The special funding was discontinued beginning in FY 2022. Despite the emergency infusion of financial aid, airports across Pennsylvania and the nation faced revenue losses due to travel restrictions, lower fuel sale volumes, and changing business operations, among other causes.

COVID relief funds did include airport operations as noted above, which are not otherwise funded through the federal or state aviation grant programs. Nor are airport operations addressed in this report directly other than in terms of opportunities for airports to generate operating funds through hangar development, energy-related initiatives, etc.

Beginning in FY 2022, BIL has added nearly $71 million in Airport Infrastructure Grant formula funds annually through the life of the law (five years) (Figure 6). These funds are not included in PennDOT funding and are allocated directly to Pennsylvania's airports for investments in runways, taxiways, terminals, airport-transit connections, roadway projects, safety projects, and sustainability projects. The BIL funding is set to expire in FY 2025-26.

courtesy of Philadelphia International Airport

Figure 6: PA's Federal Aviation Funding, FY 2012-13 through FY 2026-27



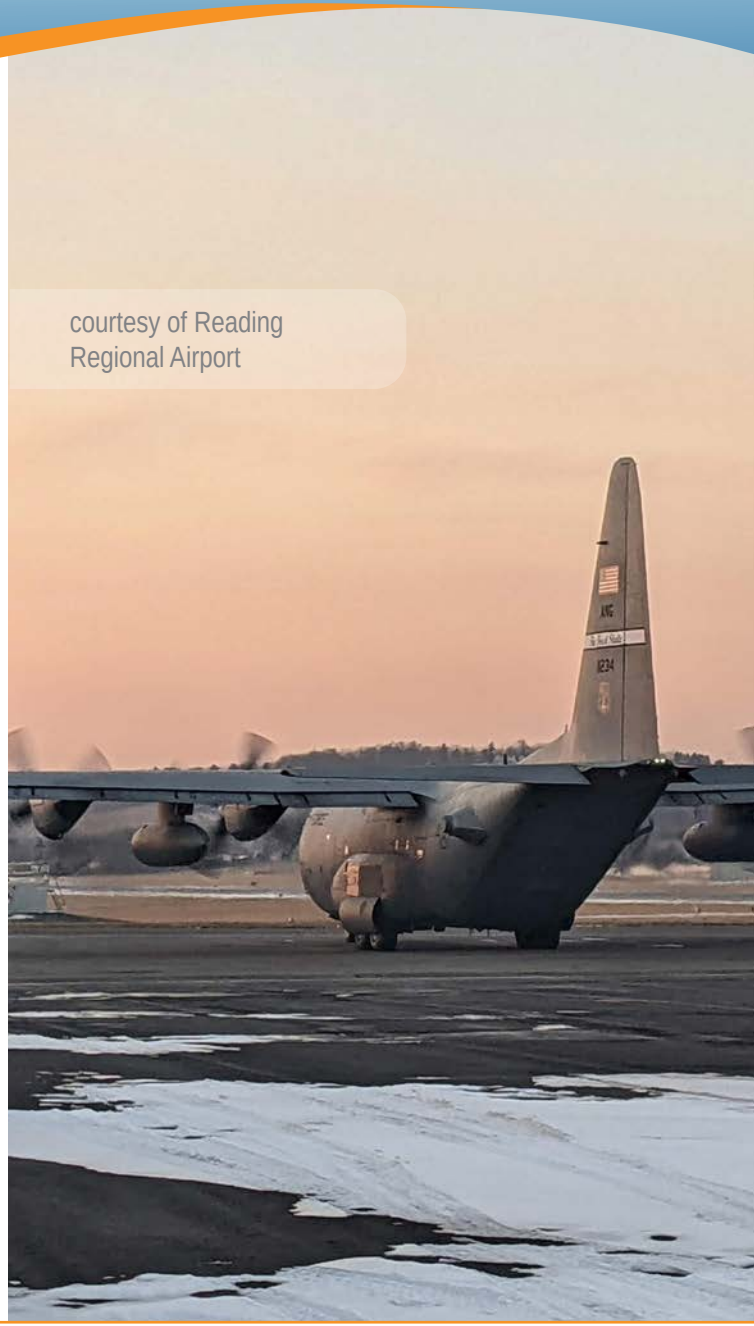
Source: FAA AIP Grant History Visualization Tool (fiscal years 2012-2021) and FAA FY 2022 grant announcements; PennDOT Bureau of Fiscal Management

State Aviation Funding Sources

As shown on Figure 7, several state funding sources also contribute to meeting the needs of aviation in Pennsylvania:

- **Motor License Fund (MLF) Aviation Restricted Account** – The MLF Aviation Restricted Account includes state revenue from jet fuel and aviation gas (avgas) taxes as well as interest income. These sources are used to fund airport development grants for facilities and equipment, real estate tax rebates,[3] and aviation safety and licensing. Funding from the Aviation Restricted Account has ranged between approximately $5 million and $8 million per year since FY 2004.
- **Capital Budget Funds** – In addition to revenues from the MLF Aviation Restricted Account, $10 million in Capital Budget funds has been allocated to aviation per year since FY 2004.
- **Multimodal Transportation Fund (MTF)** – Aviation grants through the MTF have served as a funding source since the enactment of Act 89 of 2013, averaging approximately $6.3 million per year.

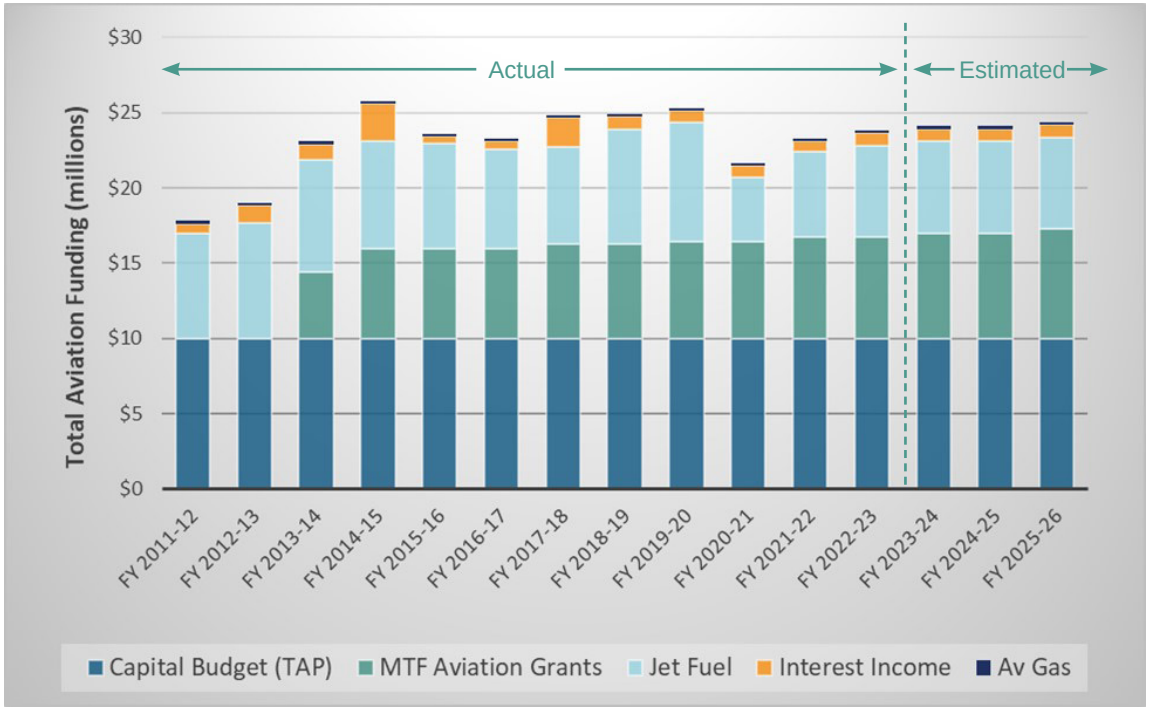
In addition to the sources above, Appropriation 16578 (Aviation Operations) provides for the operation of the Bureau of Aviation within the Department of Transportation, with funding via the Aviation Restricted Account. This appropriation is established under Act 120 of 1970, which established PennDOT; Act 164 of 1984; and the Appropriations Act of 2021. These funds are not directly allocated by formula, and distribution is based on organizational program requirements. The grants awarded from the Aviation Restricted Account must exceed the funding allotted for BOA operations. This is dictated in regulation, codified as Title 74, Part III, Aviation Chapter 51 § 5103.



courtesy of Reading Regional Airport

[3] Partial real estate tax rebates are provided for private public-use airports, for public-use portions of the property.

Figure 7: State Aviation Funding Source History, FY 2011-12 through FY 2025-26



Source: PennDOT Bureau of Fiscal Management

Aviation Project Financing - Pennsylvania Infrastructure Bank

The Pennsylvania State Infrastructure Bank (PIB) provides low-interest loans to advance high-priority transportation projects, including aviation projects, to accelerate project delivery, spur economic development, and provide assistance to local governments. Examples of aviation projects eligible for financing include runway, taxiway, apron, terminal and hangar construction; land acquisition; equipment procurement; obstruction removal; access roads; and airport lighting. The PIB could be an important financing tool going forward in combination with other funding sources.

Pennsylvania's Aviation Funding Gap

Unmet Need

Current total aviation annual funding of $164 million falls short of the annual total state need of $217.5 million, leaving an annual funding gap of approximately $53.5 million, as depicted on Figure 8. Figure 9 on the following page shows the breakdown by the classification categories used by the FAA and BOA for providing grants. The table includes the estimated needs for hangar development, emergency projects, and implementing emerging technology, which historically have not been funded.

Note that the July 2021 TROC report included aviation unfunded need as a minor component of a broader Multimodal category. The Multimodal category was primarily aimed at providing an estimate for public transportation and passenger rail (which make up the bulk of multimodal need) for the purposes of TROC's deliberations. The aviation amount of $10 million dollars was a gross estimate at the time for critical system preservation projects with limited emphasis on economic development, focusing only on BOA's aviation funding for state-local projects and state match projects. It is important to note that TROC's emphasis (over a highly compressed period to produce its report) was on the great funding need for highways and bridges. The TROC analysis did not entail the in-depth data review, analysis, and vetting for aviation that was accomplished through this TAC study, which arrived at an aviation funding need amount of $53.5 million.

Figure 8: Total Annual Unmet Need

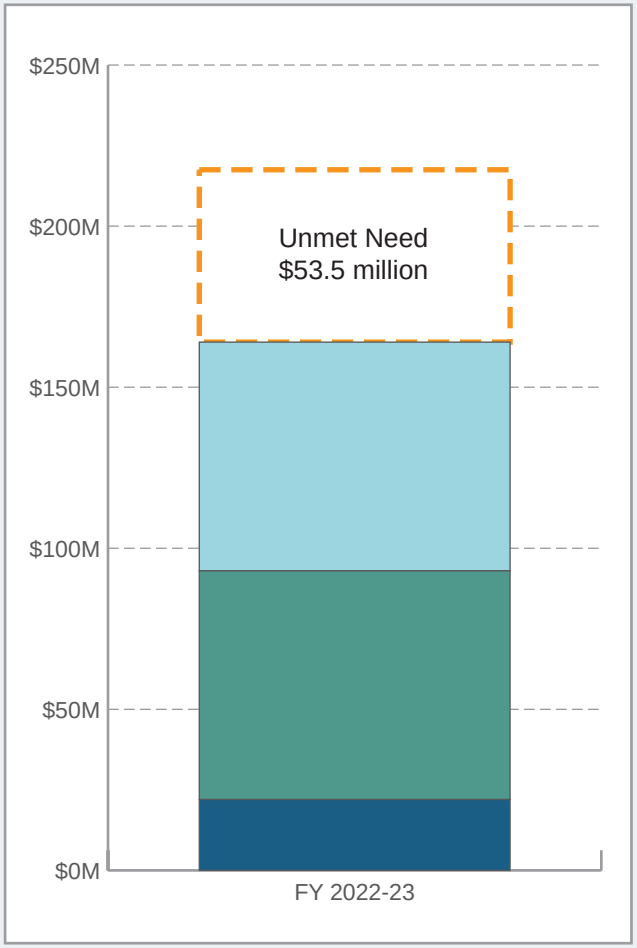


Figure 9: Unmet Need by Category

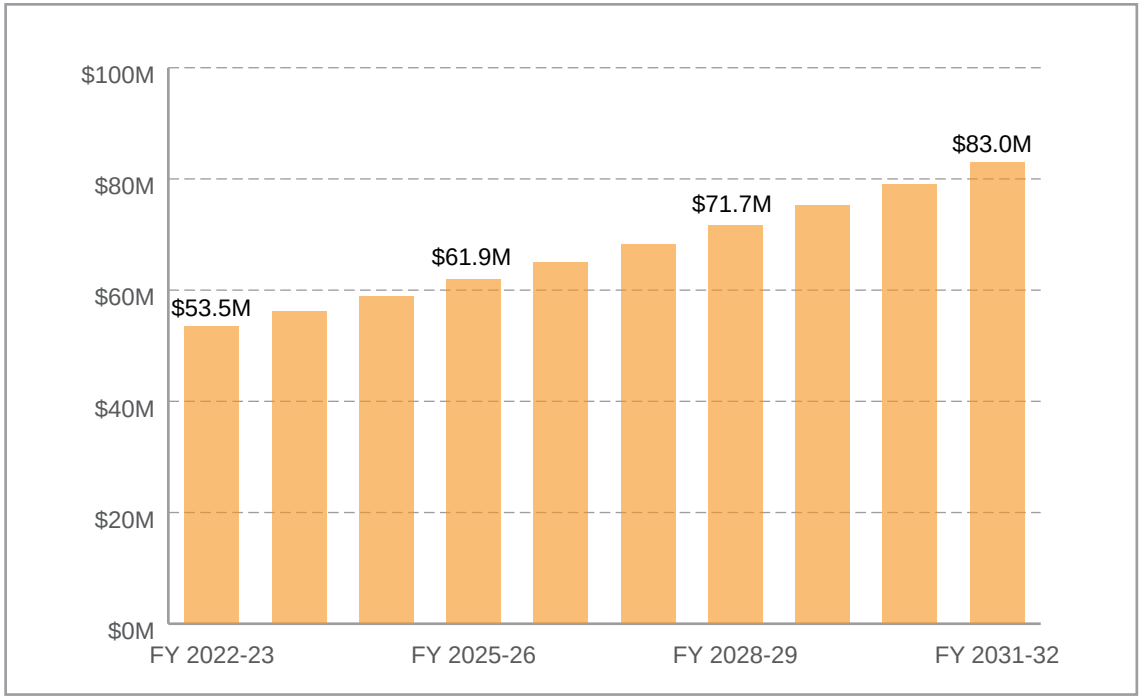
Aviation Investment Category	Total Annual Amount Needed	Total Annual Amount Funded	Total Annual Unmet Need
Commercial Service Airports (14)	$137,700,000	$121,700,000	$16,000,000
FAA-Administered General Aviation Airports (8)	$17,500,000	$13,500,000	$4,000,000
Block Grant Aviation Facilities (40)	$35,800,000	$25,100,000	$10,700,000
Public-Use Non-NPIAS Aviation Facilities (59)	$8,000,000	$3,700,000	$4,300,000
Statewide Hangar Development	$5,000,000	$0	$5,000,000
Other – Secretary's Discretionary Fund, Emergency Projects, etc.	$5,000,000	$0	$5,000,000
Emerging Aviation Technology Initiatives	$8,500,000	$0	$8,500,000
TOTAL (121 Public-Use Aviation Facilities)	$217,500,000	$164,000,000	$53,500,000

Note: Current funding amounts are five-year average figures.

The estimated annual unmet need of $53.5 million includes potential Commonwealth investment in the area of emerging aviation technology initiatives. As the executive and legislative leaders consider aviation funding, technology investment should be considered in relation to the appropriate state government role. Other states have made investments in this area.

As shown in Figure 10, assuming that state and federal funding remains relatively flat as projected, the funding gap will increase due to the effects of inflation. Any new funding sources should be structured to keep pace with inflation. The figures do not take into account the cumulative needs that would accrue if the funding gap is not promptly addressed and the backlog of projects worsens. Deferred investment in infrastructure compounds the problem and the ultimate cost of making the necessary improvements.

Figure 10: Effects of Inflation on the Funding Gap



Note: Assumes an inflation rate of 5% per year.

Deferred investment in infrastructure compounds the problem and the ultimate cost of making the necessary improvements.

What's at Stake?

Without further investment to address **airport improvement needs** the following impacts can be expected:

- Delay of critical system preservation and safety projects at General Aviation (GA) airports such as runway crack sealing and obstruction removal. Either could be detrimental for aircraft landings or takeoffs. Further, short-term closures for emergency repairs compromise airport performance and reliability.
- Diminished ability to support critical system preservation projects and key air cargo facilities for the state's 14 commercial airports. The number of commercial airports has already declined, and efforts need to be made on all fronts to prevent the loss of commercial service. The historical public-private airport partnership is structured around joint investment in airport infrastructure (airline operating agreements include provisions for the airlines to help underwrite airport improvements).
- Limited capacity to support new GA airport hangars to meet aviation demand. Pennsylvania-based pilots with based aircraft in the Commonwealth could relocate to other nearby states. Hangars also provide a revenue source for airport operations that could be diminished.
- Some air charter services and airport management companies that provide pilots and mechanics could contract, or close, or move to other states.
- Reduced ability to advance public-private partnerships supportive of air cargo infrastructure such as air cargo terminals/hangars.
- Missed opportunities for runway extensions or other large airfield expansion projects, especially at key GA airports—often an important asset in recruiting companies to locate or expand in Pennsylvania.

courtesy of Reading Regional Airport

- Limited potential to support economic development projects on airport properties, which would further boost regional economic activity.

For the **Bureau of Aviation operations**, the lack of additional funding could:

- Cause BOA to potentially end its involvement in the federal State Block Grant Program that provides roughly $13 million in federal Airport Improvement Program funds annually to 40 federal eligible GA airports. The established close working relationships between the GA airports and BOA could be weakened. The FAA eventually would be dealing with these airports directly; however, the GA airports would likely not be their top priority. Ironically, the State Block Grant Program was initially conceived and established so that the FAA could responsibly delegate this responsibility to the states (to afford better oversight and technical assistance).
- Reduce or eliminate the capacity to support aviation Science, Technology, Engineering, and Math (STEM) programs—which indirectly could impact students and potential career tracks.

Impacts on PA's Technology Readiness

In terms of adapting and positioning to the rapidly **evolving aviation technology,** the lack of additional funding would result in reduced capacity to:

- Support Unmanned Aircraft Systems (UAS) and Advanced Air Mobility (AAM). To provide the necessary support for this rapidly evolving technology, BOA needs additional staffing to coordinate statewide drone/electrical vertical takeoff and landing (eVTOL) initiatives with policy, public safety, and data management. Other states, including Michigan, Utah, North Carolina, Ohio, and Texas, have started planning for these advances.
- Develop the infrastructure needed to deploy alternative fuels such as hybrid electric and electric-powered aircraft. These types of aircraft are expected to be flying mainstream in the U.S. within the next 10 years.
- Help to plan and develop the electric power capacity to construct charging facilities at airports. Within the next 10 to 15 years, most car manufacturers' fleets are expected to be electric.
- Continue participation in the Pennsylvania interagency group (core includes PennDOT, DEP, DGS, PSP, PTC, PEMA) to evaluate existing agency-specific drone programs and uses.
- Develop a Concept of Operations to explore the possibility of a centralized statewide UAS and AAM program and ultimately develop a framework for the safe, efficient use of drones and other unmanned aircraft technologies in Pennsylvania.

How Other States Fund Aviation

According to the Congressional Research Office, five predominant sources fund airport capital development across the nation:[4]

- Federal Airport Improvement Program (AIP) grants
- Federally authorized Passenger Facility Charges (PFCs)
- Tax-exempt bonds secured by airport revenue or PFCs
- State and local grants
- Airport-generated revenue from tenant leases, landing fees, etc.

The three largest revenue funding sources according to the Government Accountability Office (GAO) are AIP grants, PFCs, and airport-generated revenue.[5] When instituted in the 1990s, Passenger Facility Charges become a much-needed new source of revenue. However, the authorized level for PFCs (capped at $4.50 per flight segment) has not been changed in more than 20 years.

AIP grants are appropriated through the Airport and Airway Trust Fund supported by several federal aviation-related taxes on tickets, cargo, avgas, and jet fuel. Current federal taxes on fuel are $0.194 per gallon on avgas and $0.219 per gallon on jet fuel.

Pennsylvania and surrounding states, except for Ohio, levy taxes on both avgas and jet fuel as a revenue source to fund aviation. Together, Pennsylvania and surrounding states have an average avgas tax of $0.106 per gallon and jet fuel tax of $0.112 per gallon.

Denver International Airport
courtesy of Shawn Keane

[4] United States Congressional Research Office, “Financing Airport Improvements.” Updated March 15, 2019, Report to Congressional Requesters, Airport Infrastructure Information on Funding and Financing for Planned Projects. *GAO Highlights.* February 2020.

[5] United States Government Accountability Office. *GAO Highlights. “*Airport Infrastructure – Information on Funding and Financing for Planned Projects.” February 2020.

Both Ohio and Virginia collect aircraft registration fees and use a portion of personal property tax to fund aviation. West Virginia uses portions of personal property tax revenue to fund aviation. Nationally, half of the states impose an aircraft registration fee and 46 percent use a portion of personal property tax for aviation purposes. Pennsylvania uses neither revenue source.

Figure 11 summarizes a few aviation revenue sources, including fuel taxes for Pennsylvania and surrounding states.

Nationally, half of the states impose an aircraft registration fee and 46 percent use a portion of personal property tax for aviation purposes. Pennsylvania uses neither revenue source.

Figure 11: State Aviation Revenue Sources – Pennsylvania and Surrounding States

State	Avgas Tax (per gallon)	Jet Fuel Tax (per gallon)	Aircraft Sales/ Use Tax (percentage of purchase price)	Aircraft Registration Fee	Personal Property Tax
Delaware	$0.230	$0.050	0.09% - 0.75%	No	No
Maryland	$0.070	$0.070	6.00%	No	No
New Jersey	$0.165	$0.195	6.88%	No	No
New York	$0.070 - $0.0173	$0.070	4.00%	No	No
Ohio	No tax	No tax	5.75%	Yes	Yes
Pennsylvania	$0.060	$0.020	6.00%	No	No
Virginia	$0.050	$0.050	2.00%	Yes	Yes
West Virginia	$0.152	$0.152	6.00%	No	Yes
Surrounding State Average	$0.106	$0.112			

Source: U.S. Energy Information Administration, "State Aviation Fuel Tax Rates," updated January 2022. National Business Aviation Association, *NBAA State Aviation Tax Report.*

Potential Funding Scenarios

Identifying potential revenue sources to close the aviation funding gap will help to ensure the Commonwealth continues to maintain and enhance its aviation assets into the future.

Several potential state-generated revenue sources were analyzed to develop the future funding options recommended by TAC. To estimate the yield from potential revenue sources, PennDOT's Bureau of Fiscal Management used the Revenue Options Calculator developed in 2021 for the TROC study. The calculator is a spreadsheet tool used to estimate revenue from potential sources to be implemented in phases. For the aviation analysis, three phases were assumed:

- Phase 1: Years 1 to 2
- Phase 2: Years 3 to 4
- Phase 3: Years 5 to 10

Phase 1 assumes legislation is required and revenue could begin to be generated within one to two years. Phases 2 and 3 assume longer lead times for revenue generation due to necessary implementation steps.

Four revenue scenarios were developed as alternatives for addressing the $53.5 million funding gap. Revenue scenarios are outlined on the following page, and estimated yield is presented in Figure 12.

courtesy of Reading Regional Airport

Scenario 1 – Aviation Sources

Addresses the funding gap using taxes and fees directly related to aviation.

- Imposes a new annual **Aircraft Registration Fee** of approximately $500 per aircraft.
- Increases the **Jet Fuel Tax** from 2 cents per gallon to 15 cents per gallon.
- Increases the **Avgas Tax** from 6 cents per gallon to 18 cents per gallon.
- Redirects the 6 percent **Aircraft Sales Tax** from the General Fund to the Aviation-Restricted Account and increases the rate to 12 percent.

Scenario 2 – General Fund

Redirects existing General Fund sources to aviation.

- Redirects the 6 percent **Aircraft Sales Tax** to aviation.
- Redirects 0.03 percent of the 6 percent **State Sales Tax** to aviation.

Scenario 3 – Package Delivery Fee

Addresses the revenue gap solely by using a portion of revenue generated by a new Package Delivery Fee.

- Directs 7 percent of revenue generated from a new **Package Delivery Fee** to aviation.

Scenario 4 – Mixed Sources

Uses a diverse set of aviation and non-aviation revenue sources to address the funding gap.

- Imposes a new annual **Aircraft Registration Fee** of approximately $300 on average.
- Increases the **Jet Fuel Tax** from 2 cents per gallon to 4 cents per gallon.
- Increases the **Avgas Tax** from 6 cents per gallon to 12 cents per gallon.
- Redirects the 6 percent **Aircraft Sales Tax** from the General Fund to aviation.
- Redirects 0.02 percent of the 6 percent **State Sales Tax** from the General Fund to aviation.
- Directs 5 percent of revenue generated from a new **Package Delivery Fee** to aviation.

Figure 12: Potential Revenue Generation by Funding Scenario

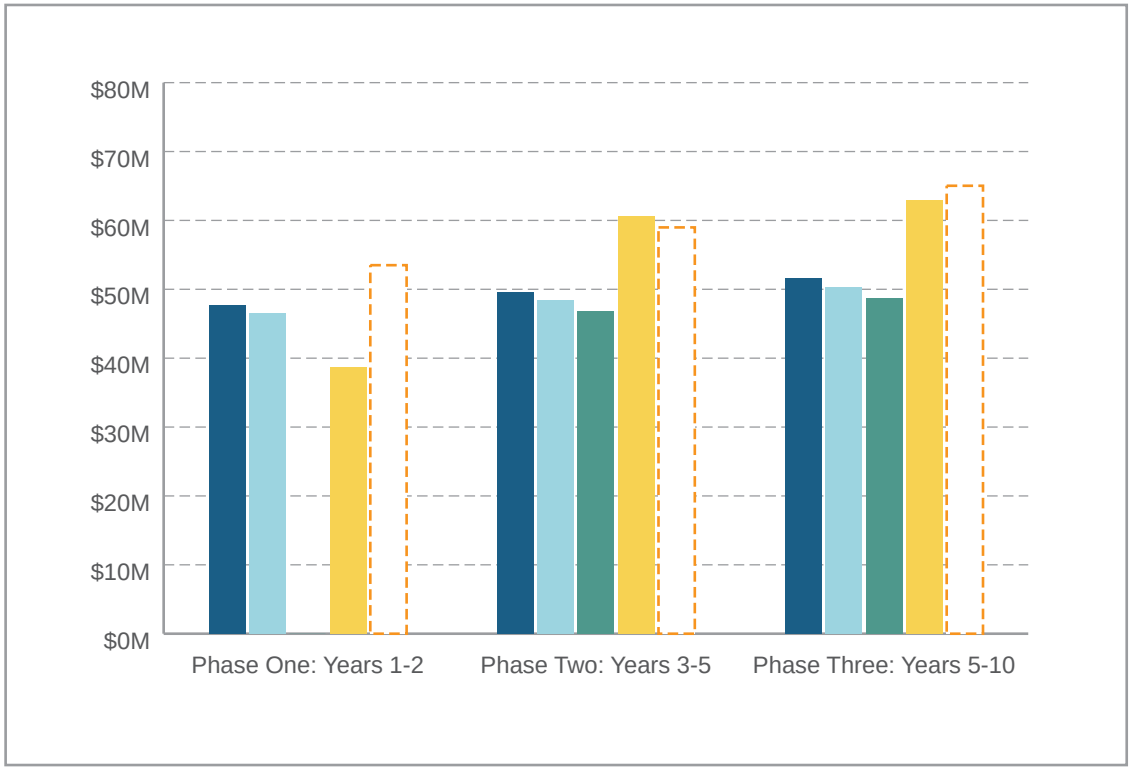
	Phase 1 (1-2 Years)	Phase 2 (3-4 Years)	Phase 3 (5-10 Years)
Funding Target	$53,500,000	$58,984,000	$65,030,000
Proposed Revenue Scenario	**Estimated Potential Revenue**		
Scenario 1 - Aviation	$47,700,000	$49,627,080	$51,632,014
Aircraft Registration Fee	$500,000	$520,200	$541,216
Jet Fuel Tax	$43,600,000	$45,361,440	$47,194,042
Avgas Tax	$600,000	$624,240	$649,459
Aircraft Sales Tax	$3,000,000	$3,121,200	$3,247,296
Scenario 2 - General Fund	$46,500,000	$48,378,600	$50,333,095
Aircraft Sales Tax	$1,500,000	$1,560,600	$1,623,648
State Sales Tax	$45,000,000	$46,818,000	$48,709,447
Scenario 3 - Package Delivery Fee	$0	$46,818,000	$48,709,447
Scenario 4 - Mixed Sources	$38,700,000	$60,551,280	$62,997,551
Aircraft Registration Fee	$300,000	$312,120	$324,730
Jet Fuel Tax	$6,700,000	$6,970,680	$7,252,295
Avgas Tax	$200,000	$208,080	$216,486
Aircraft Sales Tax	$1,500,000	$1,560,600	$1,623,648
State Sales Tax	$30,000,000	$31,212,000	$32,472,965
Package Delivery Fee	$0	$20,287,800	$21,107,427

Note: Funding target estimates reflect a 5% annual inflation rate, shown rounded at Years 3 and 5. A conservative 2% revenue escalation rate was used.

The ultimate aircraft registration fee schedule should vary by aircraft type, size, weight, number of registered seats, etc. For the purposes of estimating the revenue yield for Scenario 4, TAC used $300 as an assumed average registration fee.

Figure 13 illustrates the funding gap over 10 years (three phases) and how each of the revenue scenarios compares to that target amount.

Figure 13: Potential Revenue Generation by Phase



Source: PennDOT, Bureau of Fiscal Management. November 2022

Descriptions of potential revenue sources, including both aviation and non-aviation sources, are presented in Figure 14, including a rationale for why each revenue source was considered. Sources such as an aircraft registration fee and increases in Pennsylvania's aviation fuels have been discussed for several years. Use of non-aviation sources was discussed at Regional Listening Sessions conducted for this TAC assessment.

Additional revenue sources considered but not factored into the Revenue Option Calculator include directing a portion of the iGaming Tax and a future Cannabis Tax, if levied, to aviation. Over time such sources might be more frequently used among states and localities. To this point in time there has been hesitancy to advocate for such taxes, which could be perceived as endorsing gambling and marijuana use.

Several stakeholders suggested bond financing for airport improvements. (Note: The state's capital budget, which has funded airport improvements, is bond-financed.) TAC's funding recommendation does not include bond financing/debt. The use of Commonwealth debt financing for aviation investment is potentially worthy of consideration. Historically, however, PennDOT has been wisely cautious with debt financing. The use of debt financing obviously has fiscal policy implications. This includes identifying the associated revenue sources for retiring the debt. Because aviation does have a significant economic impact, however, expanded capital budget funding for aviation facility improvements could be considered.

Figure 14: Potential Revenue Source Description and Rationale

Revenue Source	Description	Rationale
Fees		
Aircraft Registration Fee NEW	Introduce an annual registration fee for all aircraft in Pennsylvania averaging between $300 and $500 (depending on scenario).	Owners of PA-based aircraft should pay a registration fee as do owners of motor vehicles, motorcycles, etc.
Package Delivery Fee NEW	Establish a $1 fee on all Pennsylvania last-mile deliveries and direct between 5% and 7% of the revenue to aviation purposes.	Significant increases in package delivery volumes impose maintenance and improvement costs on the state's transportation infrastructure.
Taxes		
Jet Fuel Tax	Increase tax from the current 2 cents per gallon to between 4 cents and 15 cents per gallon.	A modest tax increase is consistent with most neighboring states.
Avgas Tax	Increase tax from current 6 cents per gallon to between 12 cents and 18 cents per gallon.	A modest tax increase is consistent with most neighboring states.
Aircraft Sales Tax	Redirect 6% Sales Tax generated on aircraft from the state General Fund to aviation; under Scenario 1, increase to 12%.	Redirect existing aviation user-generated taxes to aviation-specific revenue.
State Sales Tax	Redirect a portion of the 6% Sales Tax revenue to aviation (0.03% for Scenario 2; 0.02% for Scenario 4).	Redirecting a portion of the state sales tax to aviation supports multimodal transportation.

State Funding Recommendations

TAC recommends Scenario 4, Mixed Sources, summarized below, because it includes a blend of traditional aviation sources that with modest increases will not overly burden the aviation industry. It also includes a new revenue source, a proposed Package Delivery Fee, which can be directly tied to aviation.

Scenario 4 would be implemented following a phased approach as was shown in Figure 13. As illustrated in Figure 15, Scenario 4 would not compensate for the expiration of BIL funding.

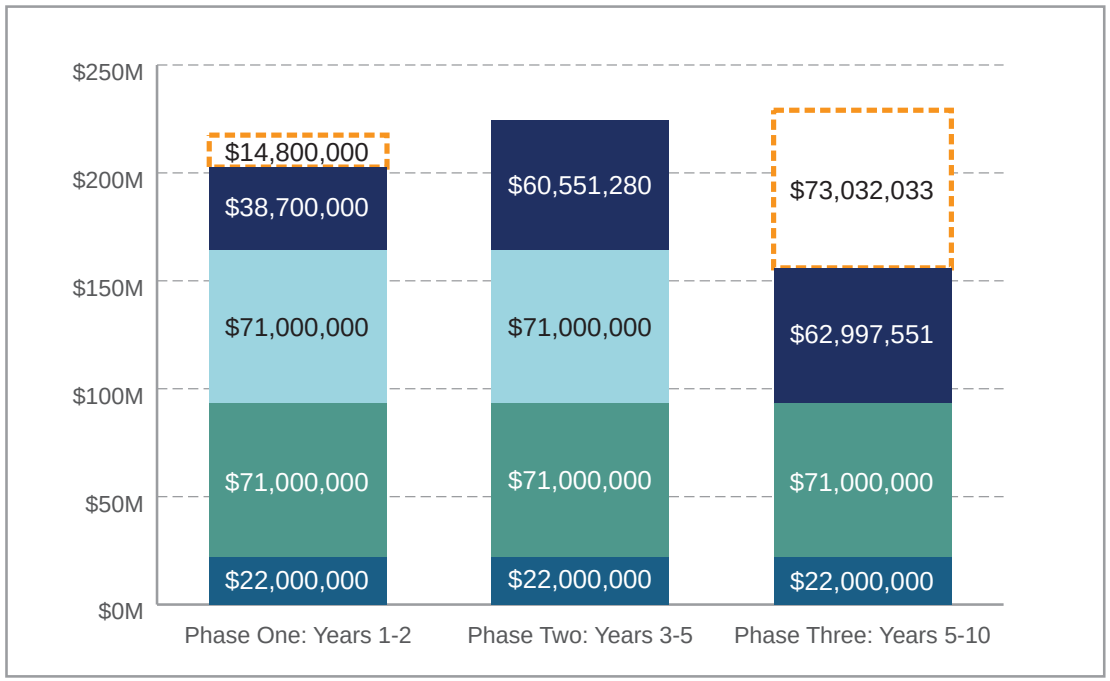
Scenario 4 – Mixed Sources

Uses a diverse set of aviation and non-aviation revenue sources to address the funding gap.

- Imposes a new annual **Aircraft Registration Fee** averaging $300 per aircraft.
- Increases the **Jet Fuel Tax** from 2 cents per gallon to 4 cents per gallon.
- Increases the **Avgas Tax** from 6 cents per gallon to 12 cents per gallon.
- Redirects the 6 percent **Aircraft Sales Tax** from the General Fund to aviation.
- Redirects 0.02 percent of the 6 percent **State Sales Tax** from the General Fund to aviation.
- Directs 5 percent of revenue generated from a new **Package Delivery Fee** to aviation.

The TAC recommendation includes a two-cent increase for the jet fuel tax, which has not been increased for several decades. If the two-cent level had been adjusted for inflation the present taxing level would likely exceed four cents a gallon. It is recognized that increasing the jet fuel tax may face some opposition. However, a two-cent increase is a reasonable component of an ultimate funding package consisting of multiple sources. The two-cent proposed increase was vetted with several airport stakeholders who affirmed its reasonableness. Should it be deemed necessary to not increase the Jet Fuel tax, a corresponding increase would need to be made with one or more of the other fees or taxes included in the funding recommendation.

Figure 15: Impact of Recommended Funding Scenario over 10 Years



Note: Phase Three values assume BIL funding expires in FY 2025-26 as per current legislation.

Implementing the recommended scenario will require a concerted legislative and policy effort. Ultimately, the General Assembly and the Governor will decide upon a funding approach for Pennsylvania aviation. See the Next Steps section for more on implementation.

Locally Generated Revenue Options

This study focused primarily on state-level revenue sources, however there are local opportunities for individual airports to generate additional revenue. This includes hangar development and most recently the passage of Airport Land Development Zone (ALDZ) legislation. Further details and strategies on airport revenue generation are included in the Economic Impact/Economic Development section.

courtesy of Philadelphia International Airport


Hazleton Regional Airport
courtesy of Fran Strouse

courtesy of Westmoreland County Airport Authority

Part 2: Leveraging Our Aviation Investment

Overview

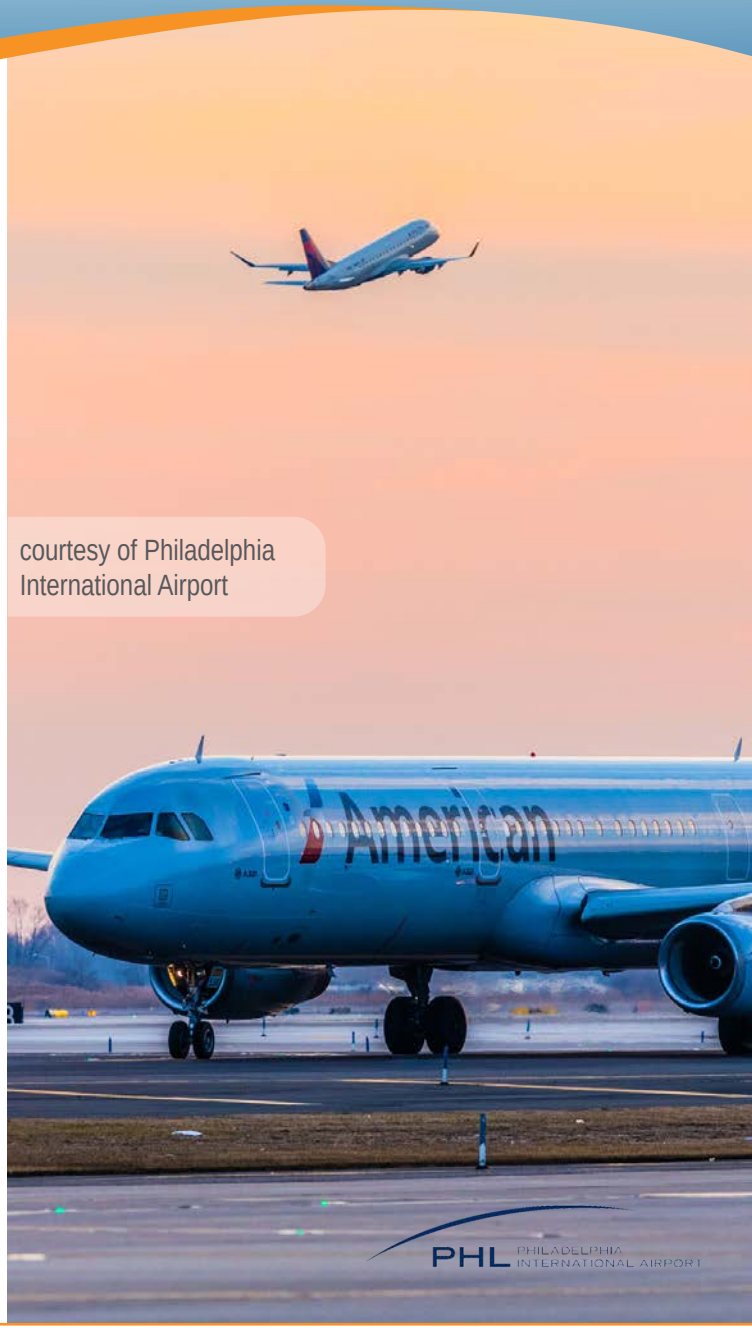
Part 1 addressed the financial need of Pennsylvania's public-use airports and potential funding sources to help address the need. Part 2 addresses a wider range of issues and opportunities that contribute to the effectiveness of Pennsylvania's aviation system—ensuring that aviation funding generates the greatest possible return for Pennsylvanians. While TAC is recommending expanded state investment in aviation, it is also emphasizing that there must be a broader strategic framework for the reinvestment strategy. This section lays out the strategic areas for attention.

Outreach and analysis yielded more than 30 issue and opportunity statements that inform this part of the report. They are organized into the following eight categories, which form the structure for Part 2:

- Workforce
- Economic Impact/Economic Development
- Airports and Communities/Land Use
- Air Freight
- Commercial Air Service
- Technology
- Industry Collaboration and Partnerships
- Legislation and Policy

Note that these categories are all areas in which state government and others have a stake—underscoring the necessity of this state-level review, drawing on the statewide perspective of TAC, PennDOT, and other state agencies.

Together the eight topical areas form a comprehensive strategic direction. As such, each is organized to present the issue in brief, provide a situation analysis with context and the current status of each issue, and then list the recommended strategic actions.



courtesy of Philadelphia International Airport

The strategic actions in this report vary in terms of the implementers. It is assumed that PennDOT and the Bureau of Aviation will work with other state agencies, regional organizations, and others to establish the various lead and support roles.

It should be noted that TAC's recommendations for expanded aviation infrastructure investment, and for advancing the various strategic efforts described herein, entails an expanded role for the Bureau of Aviation. There is an associated need for additional funding for BOA operations of approximately $2.5 million per year. That estimate includes staffing and engaging needed subject-matter expertise to address the state's growing aviation responsibilities, including for example UAS and AAM.

Harrisburg International Airport courtesy of Susquehanna Area Regional Airport Authority

Workforce

Issue In Brief

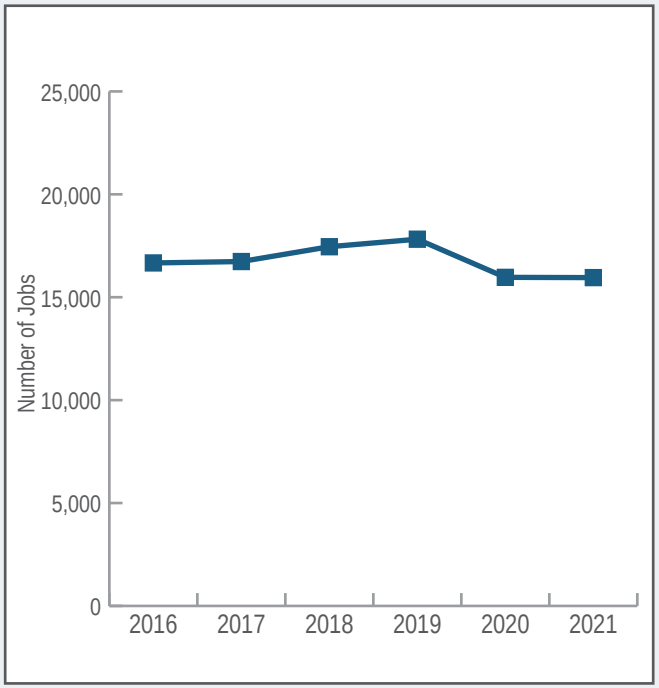
Workforce shortages in aviation occupations are a barrier to continued industry growth and to meeting present staffing needs. Addressing current workforce shortages and implementing solutions to develop the next generation of industry professionals—from pilots, to mechanics, to airport managers—is critical to maximizing aviation's impact on Pennsylvania's economy.

Situation Analysis

Pennsylvania faces an aviation industry workforce shortage that was exacerbated by the COVID-19 pandemic, resulting in a drop in employment in 2020[6] (Figure 16). With the nation's economy rebounding after the pandemic, commercial air travel demand rapidly increasing, and air cargo increasing as well, the aviation industry needs to fill open jobs. Labor demand is high, the number of available workers is low, and aviation is competing with other industries for personnel. The aviation sector can provide an excellent career path for many Pennsylvanians.

Aircraft pilots and Airframe and Powerplant (A&P) mechanics are two high-demand aviation occupations. According to a 2021 aviation industry update presented to the Pennsylvania Senate Aviation Caucus, Boeing predicts that the U.S. will need 763,000 pilots and 739,000 maintenance technicians between 2021 and 2039, not including the Unmanned Aircraft Systems (UAS) industry.[7] On average, the nation's pilots are getting older, and with a present pilot age cap of 65, finding and training new pilots is

Figure 16: Pennsylvania Aviation Employment



Source: DCED, *Pennsylvania On Target*, April 2022

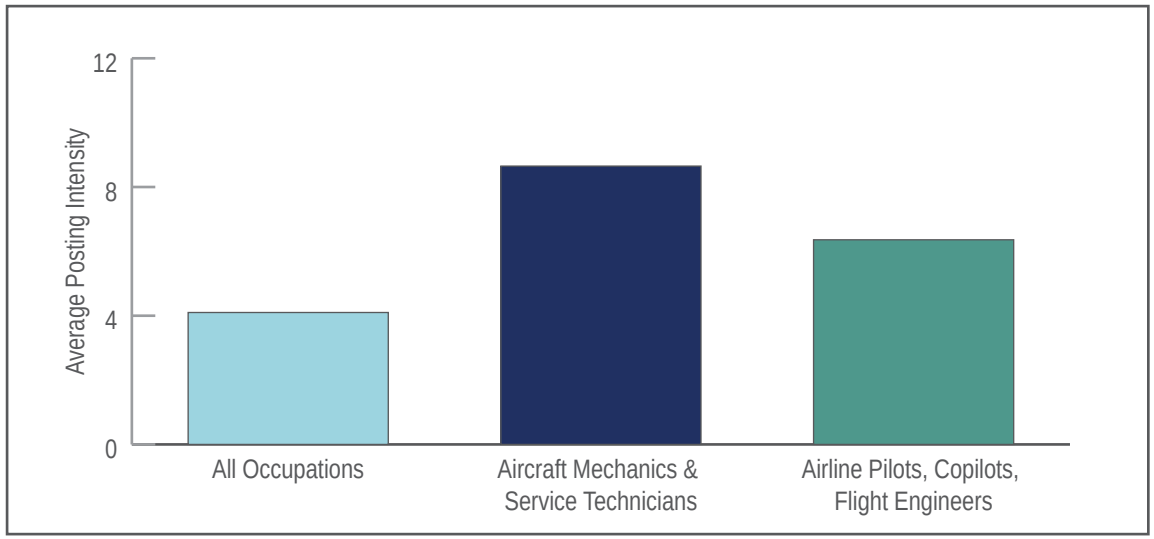
[6] Aviation jobs include workers who were employed within the Air Transportation and Support Activities for Air Transportation industries, a subset of the Transportation and Logistics cluster per *Pennsylvania On Target*.

[7] Pennsylvania Senate Aviation Caucus, March 15, 2021. Accessed online at: https://aviation.pasenategop.com/031621/.

an aviation industry priority. Proposed federal legislation introduced in July 2022 would raise the mandatory retirement age for pilots to 67.[8] This change could be particularly important to Pennsylvania with its older population on average.

As shown in Figure 17, online job postings for aircraft mechanics appear twice as frequently as the average rate for all occupations. Just as challenging, and noted by aviation stakeholders, is finding skilled workers to fill general airport laborer and administrative positions.

Figure 17: Aviation Job-Posting Intensity



Source: DCED, *Pennsylvania On Target,* April 2022.

[8] Reuters. "Republicans propose raising commercial pilots' mandatory retirement age." July 25, 2022. Accessed 8/8/22 at: https://www.reuters.com/world/us/us-senator-proposes-raising-mandatory-commercial-pilot-retirement-age-67-2022-07-25/.

AOPA High School Aviation STEM Curriculum

To inspire the future workforce, the Aircraft Owners and Pilots Association (AOPA)—the nation's largest aviation airport advocacy group—developed a high school (grades 9 through 12) aviation STEM (Science-Technology-Engineering-Math) curriculum.

Credit courses and hands-on experiments/ experience prepare students to pass their FAA private pilot written or commercial drone or UAS operator exams by the time they graduate high school.

The curriculum introduces future engineers, mechanics, technicians, and others pursuing STEM-based career fields to the aviation industry. Pennsylvania educators should consider this program as a vehicle to inspire STEM education and vocational preparation.

The long-term success and viability of Pennsylvania's aviation industry depends on recruitment and retention strategies to engage the future workforce. Although an aviation curriculum has been developed nationally to introduce aviation principles and careers to high school students, and first-rate education and industry partnerships and youth-focused initiatives to spark aviation interest do exist in Pennsylvania, a cohesive statewide workforce strategy to meet demand is needed.

A gap in workforce, training, and experience was also reported in relation to Pennsylvania airport management. While larger airports, and several general aviation airports, have adept, experienced airport managers and airport authority boards, smaller airports generally do not, primarily due to lack of staff and financial capacity. Airport managers and aviation boards could benefit from training and technical assistance similar to that provided to local government officials through established Pennsylvania initiatives such the Local Technical Assistance Program (LTAP) and PennDOT Connects. Given the rate of change in aviation, developing and sharing knowledge among Pennsylvania's airports would go a long way toward preserving and enhancing the Commonwealth's existing airport system.

Minnesota and North Carolina have developed programs focused on the needs of aviation industry management, each maintaining an airport technical assistance program (AirTAP). Minnesota's AirTAP program, funded through the Minnesota Department of Transportation Office of Aeronautics and Aviation, has been in operation since 2000 and is housed at the University of Minnesota. Estimated program costs are $140,000 annually including:[9]

- Program Administration, Assessment and Evaluation
- Web Site, Infrastructure, Information Resources & Briefings

[9] Minnesota AirTAP. Cost estimates and program contents provided via e-mail August 5, 2022.

Examples of Pennsylvania Aviation Education & Training Sites

- Pittsburgh Institute of Aeronautics
- ATP Flight School – Pittsburgh
- St. Francis University Aviation Specialization
- James M. Johnson School of Aviation Sciences at Community College of Beaver County
- Aviation Institute of Maintenance (AIM) – Philadelphia Campus
- Pilots with a Purpose – Capital City Airport

Examples of Pennsylvania Youth Aviation Initiatives

- Philadelphia AIM Jet Tech STEM Camp
- Chester County Airport National Aviation Day
- Young Eagle Flights and Young Eagle Rallies
- Aviation Explorer Posts through Civil Air Patrol

- AirTAP Training Delivery
- MN Airports Conference Delivery

North Carolina's AirTAP (NC AirTAP) is housed at the North Carolina State University Institute for Transportation Research and Education. The program began in 2016 and is funded through the North Carolina Department of Transportation, Division of Aviation.

NC AirTAP recently started an Airport Leadership and Management Program (ALMP) through which participants can earn designation as a North Carolina Airport Professional. The inaugural class of 20 airport managers received the credential in 2022.[10]

Attendee course fees are modest, at $20 for on-demand virtual instruction or $30 per in-person course. Development and deployment costs for the ALMP course series were approximately $200,000 in FY 2021.

Establishing a Pennsylvania AirTAP would also provide a forum for airport managers to collaborate and share best practices. Pennsylvania should also strongly consider the university partnership model followed by North Carolina and Minnesota.

North Carolina AirTAP Curriculum

The NC AirTAP curriculum includes 12 training and continuing education courses addressing relevant aviation topics:

- Airport Rules and Regulations, Minimum Standards, and Legal Issues
- Airport Administration and Governance
- Airport Operations and Maintenance
- Airport Funding and Finance
- Airport Safety and Security
- Airport Planning and Environmental
- The Fixed-Based Operator
- Airport Public Relations and Communications
- Airport Design and Construction
- Airport Leadership and Management Skills
- Future Airport Opportunities
- The Airport Consultant

[10] AviationPros. "N.C. Airport Managers Earn Inaugural Leadership and Management Credential." February 23, 2022. Accessed 8/4/22 at: https://www.aviationpros.com/education-training/press-release/21258006/north-carolina-department-of-transportation-nc-airport-managers-earn-inaugural-leadership-and-management-credential.

Strategic Actions – Workforce

1. **Implement a comprehensive aviation training and recruitment strategy.**

    a. Work with the Pennsylvania Department of Education (DOE) to offer the Aircraft Owners and Pilots Association (AOPA) High School Aviation STEM Curriculum at Pennsylvania school districts.

    b. Advance aviation and avionics as academic fields of study at Pennsylvania higher-education institutions.

    c. Collaborate with Pennsylvania's network of career and technical centers (CTCs) and industry partners to offer an avionics and aviation curriculum.

    d. Facilitate the development and creation of new flight academies or trade schools throughout Pennsylvania and support existing schools.

    e. Implement a statewide outreach and marketing strategy to encourage interest in an aviation career at all ages, from youth to adults seeking career options.

    f. Enhance existing scholarship or tuition reimbursement programs to support aviation and avionics education and training.

    g. Include the growing Unmanned Aircraft Systems (UAS) industry in training and recruitment strategies.

2. **Support legislative efforts to raise the federal mandatory retirement age for pilots.**

    a. Through the Aviation Council of PA (ACP), advocate for federal legislation to raise the pilot retirement age from 65 to 67. State officials should also communicate their support to Pennsylvania's congressional delegation.

3. **Equip airport managers and authority boards with the tools necessary to proactively preserve and enhance Pennsylvania's airports by improving the quality and efficiency of airport operations and transferring knowledge.**

    a. Develop an Airport Technical Assistance Program (AirTAP) similar to Minnesota's or North Carolina's AirTAP programs. Strongly consider the university partnership model common to both states.

    b. Implement an airport leadership and management certification program to develop a consistent level of core competencies throughout Pennsylvania's airports and recognize airport management experience and leadership, similar to North Carolina's AirTAP Airport Leadership and Management Program (ALMP).

Economic Impact/ Economic Development

Issue In Brief

Pennsylvania's airports clearly have a significant impact on the economy of their host communities, yet ironically many airports are not adequately integrated into local and regional economic development strategies. The economic impact of Pennsylvania's airports has been documented by PennDOT BOA.[11] Recognizing and optimizing aviation as an economic asset for both business development and tourism development will multiply future benefits. Pennsylvania airports need to generate additional revenue to maintain financial sustainability and continue to provide economic value to the Commonwealth into the future.

Situation Analysis

Economic development generates wealth to fulfill community vision and the aspirations and well-being of people. Unlike community development which makes a community a better place to live and work, economic development creates wealth which results in community benefits. More than just job creation, it is an investment in expanding an economy, creating jobs, improving community quality of life, and allocating limited resources. Retaining and expanding existing businesses and attracting new businesses are the main approaches to improving local economic development.

Airports and the aviation industry play a vital role in economic development. From a business expansion and attraction standpoint, an airport can be marketed in efforts to attract a new company to an area, selling the airport's services for both corporate travel and transportation of air cargo. An airport can also be marketed for new development on and surrounding airport property, attracting new businesses to an area—a goal of the Commonwealth's new Airport Land Development Zone (ALDZ) program (see next page). Facilitating tourism is a further economic benefit of the aviation industry.

[11] https://www.penndot.pa.gov/Doing-Business/Aviation/Planning%20and%20Zoning/Documents/2019%20PA%20Interim%20Annual%20Update%20Economic%20Impact%20of%20Aviation.pdf

Airport Land Development Zone Program

Signed into law July 8, 2022, the Airport Land Development Zone (ALDZ) Program provides a new tool to encourage private investment and job creation on land and at buildings owned by Pennsylvania airports. As shown on Figure 18, ALDZ creates an economic incentive (tax credit) for Pennsylvania businesses to create jobs. For the host airport, ALDZ provides an additional revenue source and encourages and strengthens partnerships between the airport and development community including municipalities, developers, and employers.

Figure 18: ALDZ Program Impact

Statewide	Estimated to create an estimated 5,200 new jobs statewide within five years of program creation. Revenue-neutral program—if jobs are not created, there is no cost to the Commonwealth.[12]
Airports	Provides an added airport revenue source generated from well-structured leases on vacant land and buildings owned or leased by an airport and strengthens partnerships.
Employers	Employers receive a $2,100-per-job tax credit for each net new job created in an ALDZ each year for 10 years.

Program Synopsis/Timeline

- Program Administration
  - » ALDZ will be administered by the Pennsylvania Department of Community and Economic Development (DCED) and the Pennsylvania Department of Revenue (Revenue).
- Guidelines/Approval
  - » DCED published program guidelines in November 2022, with plans to begin accepting Airport Land Development Zone Plans (ALDZ Plans) from commercial service airports and non-commercial service airports in December 2022.
  - » DCED will approve plans (in the order received) within 60 days or request additional information. Revised plans will be reviewed within 60 days.
  - » DCED will notify Revenue of ALDZ parcels within 60 days of approval.
- Airport Land Development Zone Designation
  - » ALDZ property must be owned by the airport or leased to a third party while continuing to be owned by the airport. ALDZ property must be vacant and existing buildings unoccupied as of December 31, 2021.
  - » The ALDZ program has a statewide 4,000-acre program cap: 2,000 acres for commercial service airports at 300 acres maximum per airport, and 2,000 acres for non-commercial service airports at 50 acres maximum per airport.
  - » The ALDZ Plan will include a legal description of each parcel included, certification of building and land vacancy, and a map and diagram of each parcel in the plan.
  - » The ALDZ Program does not supersede applicable FAA, state, and local approvals.
- ALDZ Tax Credit
  - » Employers may claim an ALDZ tax credit against a qualified tax liability by submitting documentation annually by February 15 to Revenue.
  - » In turn, Revenue will send an ALDZ employer a certificate verifying the tax credit qualification by May 15.
  - » For each full-time equivalent employee new to the Commonwealth, an ALDZ employer will receive a tax credit of $2,100 to offset the employer's qualified tax liability each year for a period of 10 years during the 20-year period beginning July 1, 2022, and ending June 30, 2041.
  - » An ALDZ employer may not claim a tax credit under both the ALDZ Program and the Keystone Opportunity Zone or Keystone Opportunity Expansion Zone program.

[12] Aviation Council of Pennsylvania, Airport Land Development Zone Program SB562 (Scavello) overview. June 21, 2022.

Industry Cluster and Economic Impacts

Pennsylvania's aviation industry is a component of the industry clusters defined by both the Pennsylvania Department of Labor & Industry (L&I) and the Pennsylvania Department of Community and Economic Development (DCED). Clusters are a group of industries closely linked by common product markets, labor pools, similar technologies, supplier chains, and/or other economic ties. Aviation is included within L&I's Logistics and Transportation cluster and DCED's Distribution & Logistics cluster.

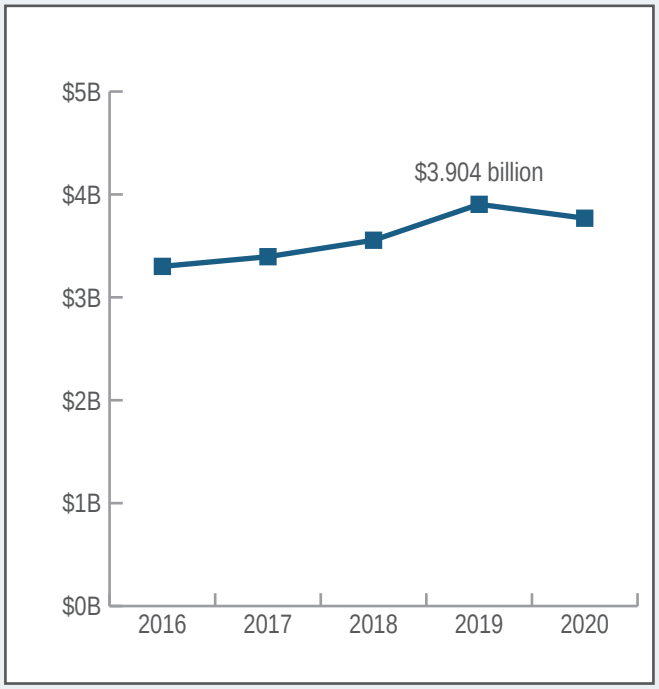
Although the nomenclature used by L&I and DCED differs slightly, the aviation industry is a key component in Pennsylvania's transportation economy. Aviation provides tremendous economic value to Pennsylvania as gauged by the industry's Gross Regional Product (GRP) measure. GRP is a monetary measure of a region's market value of goods and services produced over a specified time. In this case "region" refers to Pennsylvania. As shown on Figure 19, aviation's GRP has been steadily trending upward since 2016, with a drop in 2020 due to the COVID-19 pandemic. Pennsylvania aviation directly contributes nearly $4 billion to Pennsylvania's economy, 0.91 percent of the total state GRP.

The economic impacts of the aviation industry are documented in BOA's *Economic Impact of Aviation in Pennsylvania, 2022 Update*. The report identified the economic impacts associated with airports throughout Pennsylvania—both commercial service and general aviation facilities. It also estimated the economic impact of related activities found beyond the boundaries of the airport. The report estimated that Pennsylvania's airports:

- Supported approximately 226,000 jobs
- Produced $34 billion in annual economic impact

Results of the economic impact analysis can be used to market the economic value of Pennsylvania's airports as a statewide asset.

Figure 19: PA Aviation Gross Regional Product, 2016-2020



Source: DCED, *Pennsylvania On Target*, April 2022

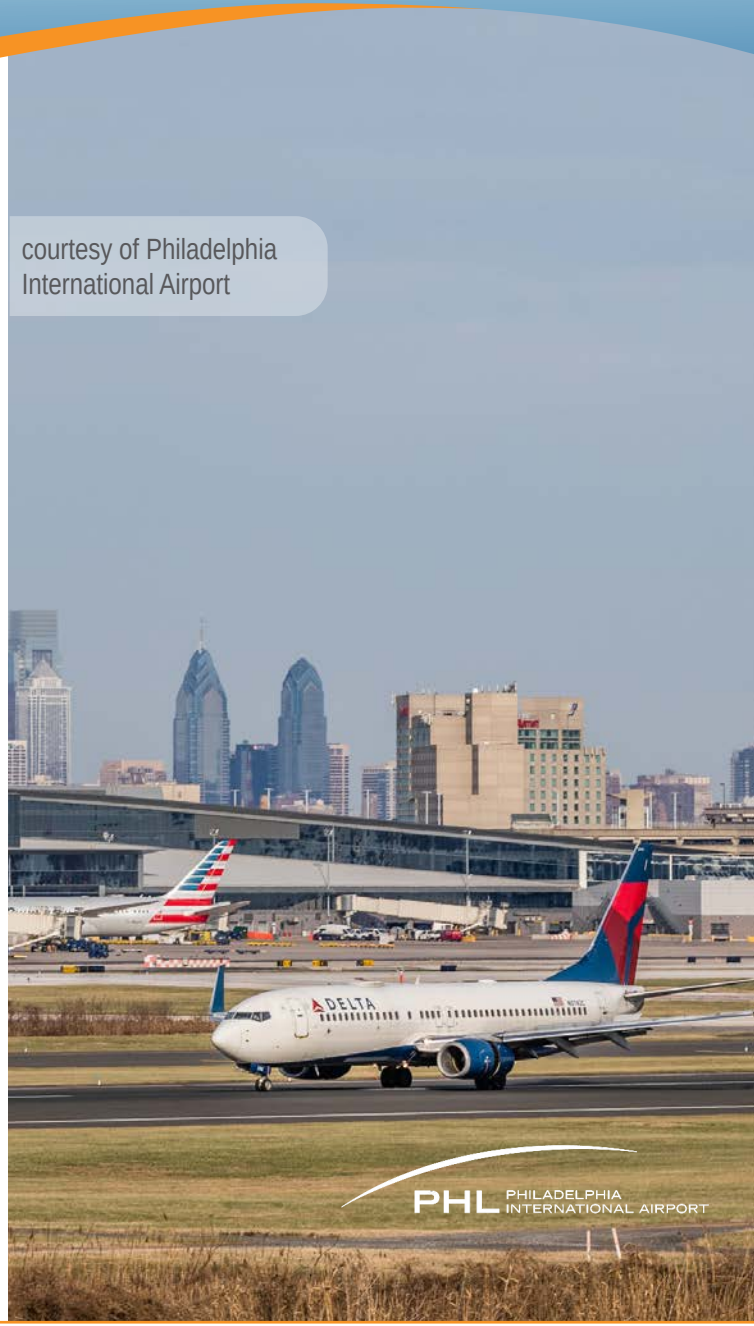
Marketing Aviation

Developing new economic development opportunities within and beyond the borders of an airport requires an airport to partner with many entities and organizations, particularly county and local economic development organizations, to implement a marketing strategy. It is important to note that stakeholders emphasized to TAC that Commonwealth policy for aviation funding should treat aviation as a key economic sector, not as infrastructure only.

Pennsylvania has a network of economic development organizations covering its 67 counties. These entities possess local, situational knowledge of business needs such as workforce, infrastructure, etc., as well as knowledge of targeted industry clusters aligned with a county's assets. Local and regional economic development partners know the types of businesses and industry sectors suited to their county's assets. Pennsylvania's local economic development network is the local conduit for DCED and the Governor's Action Team (GAT), which focuses on larger economic development projects throughout Pennsylvania.

From a statewide perspective, Pennsylvania markets its economic advantages through DCED and is currently focused on eight main industries. As noted previously, aviation is included within the Distribution & Logistics industries. The most recent aviation-specific marketing effort was in 2015 when DCED partnered with the Pennsylvania Senate Aviation Caucus and Pennsylvania Department of Revenue to promote the elimination of the fixed-wing sales tax for aircraft maintenance enabled under Act 52 of 2013. Through a series of promotional videos and press releases, the benefits of reducing the sales tax were marketed to airport users.

DCED also provides annual marketing resources for Pennsylvania tourism. Prior to the pandemic, traveler spending on air transportation was growing, increasing from $3.299 billion in 2016 to $3.715 billion in 2019. As noted in DCED's annual economic



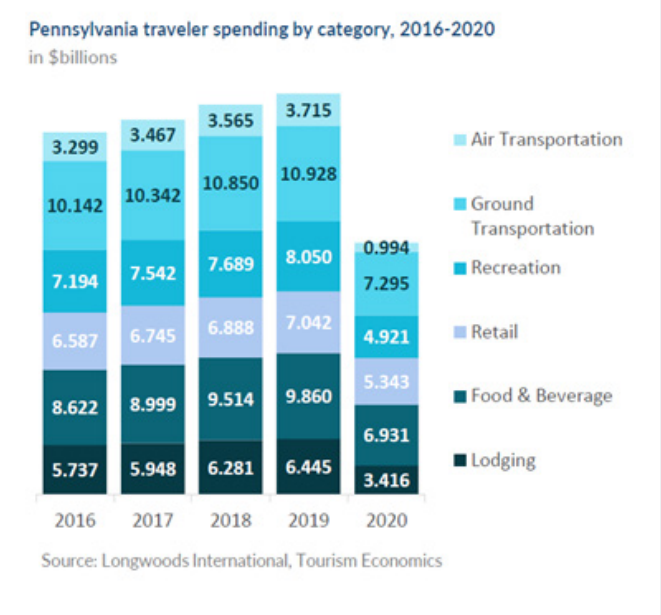
courtesy of Philadelphia International Airport

impact of tourism report, “Air transportation by far suffered the greatest loss among the major spending categories [due to the pandemic] with flights from overseas markets practically non-existent and domestic travelers opting to drive to their travel destinations whenever possible[13] (Figure 20).

Pennsylvania promotes 11 tourism regions, with traveler spending on transportation amounting to more than 25 percent of total trip costs in all but one region (Figure 21). The opportunity to regain losses in air travel resulting from COVID-19 is realistic as the world continues to move past the pandemic.

Focusing on both the economic and tourism advantages of aviation through enhanced marketing partnerships among DCED, BOA, and the aviation industry would be beneficial. Developing a unified communications strategy among all stakeholders would leverage limited resources at a time when staff capacity is limited.

Figure 20: PA Tourism-Related Spending, 2016-2020

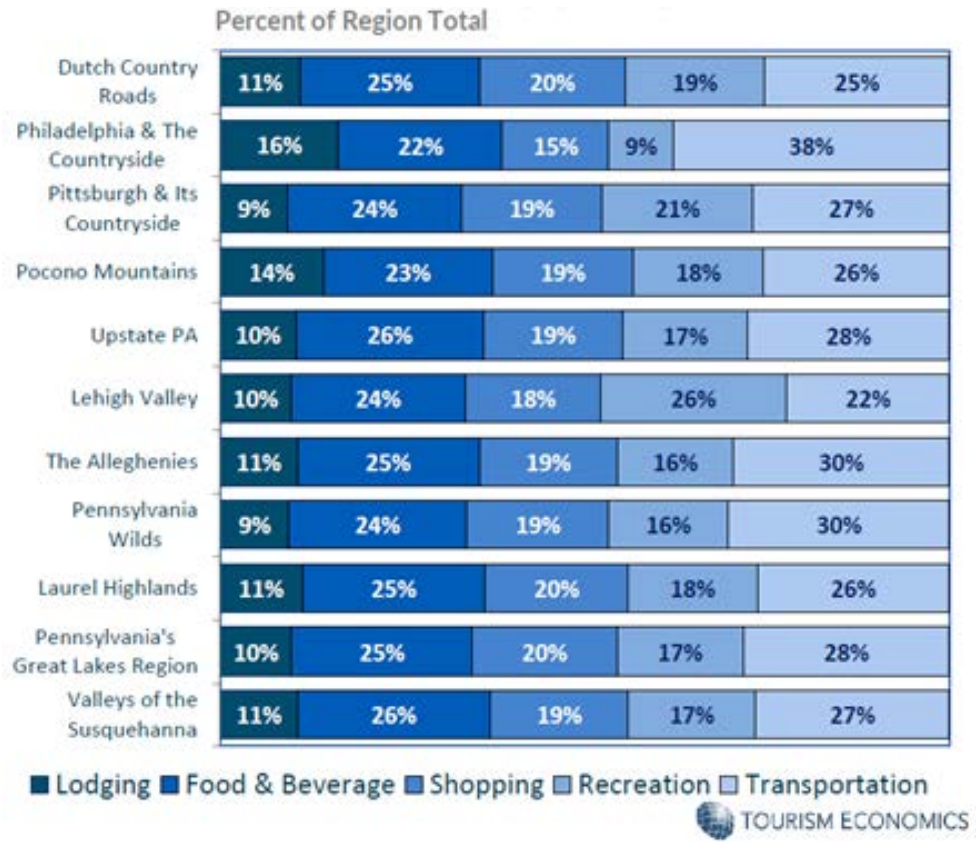


Source: Tourism Economics, *Economic Impact of Travel & Tourism in Pennsylvania*, 2020

The opportunity to regain losses in air travel resulting from COVID-19 is realistic as the world continues to move past the pandemic.

[13] Tourism Economics. *Economic Impact of Travel & Tourism in Pennsylvania.* 2020. p.16.

Figure 21: Tourism Spending by Category and Region, 2020



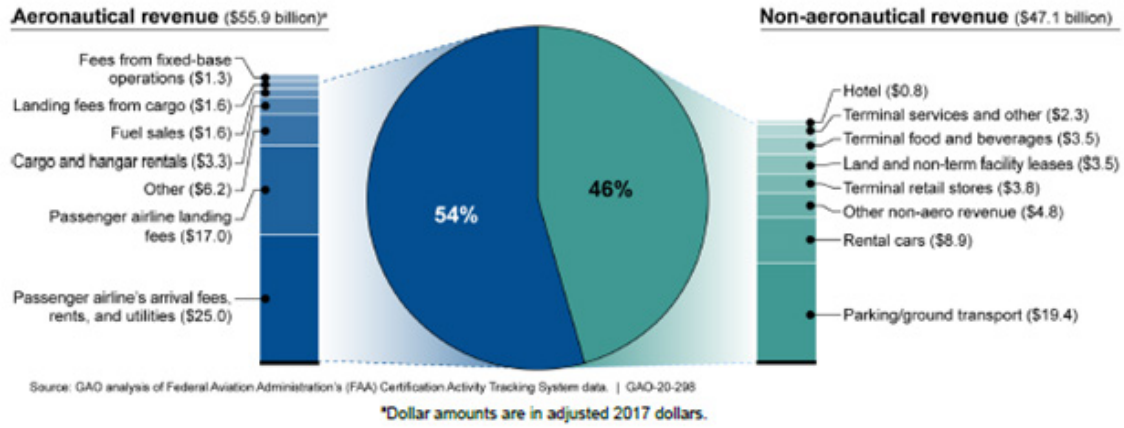
Source: Tourism Economics, *Economic Impact of Travel & Tourism in Pennsylvania*, 2020

courtesy of Reading Regional Airport

Airport Revenue Generation

According to the U.S. Government Accountability Office (GAO), airport-generated revenue increased 18 percent between fiscal years 2013 and 2017, more than federal Airport Improvement Program (AIP) grants and federally authorized Passenger Facility Charges (PFCs).[14] Figure 22 illustrates aviation and non-aviation revenue generated at all U.S. airports between 2013 and 2017.

Figure 22: Aviation and Non-Aviation Revenue, All U.S. Airports, 2013-2017



Source: GAO-20-298, Airport Infrastructure, February 2020, p. 18.

[14] United States Government Accountability Office. *GAO Highlights*. "Airport Infrastructure – Information on Funding and Financing for Planned Projects." February 2020.

Developing tools to facilitate and diversify local airport revenue generation will not only improve airport sustainability but will also increase the aviation industry's impact on statewide GRP. Implementing proactive statewide strategies to improve hangar development and local strategies to position an airport to generate alternative and renewable energy would strengthen and economically improve the aviation system.

Airport Hangars – Costs and Constraints

Airport hangars and fuel sales are the predominant sources of revenue generated by Pennsylvania airports, particularly general aviation airports.[15] Generally, the more occupied hangars at an airport the greater the fuel sales, increasing revenues. Box hangars are more flexible than T-hangars due to their capability to house larger, more expensive aircraft or several smaller aircraft.[16] In addition, box hangars offer added potential revenue associated with aircraft maintenance. Monthly average rents for airport hangars differ throughout Pennsylvania. Lease rates in more favorable markets such as Philadelphia and Pittsburgh and surrounding areas can be $1,000 or more monthly. North of I-80 lease rates are lower, at approximately $250 per month.

Generating increased hangar revenue requires construction of new airport hangars. On average, each general aviation airport in Pennsylvania has a hangar waiting list of 19 aircraft owners. With the design life of a hangar at approximately 30 years, there will be continual demand for new hangars.

However, constructing new hangars is becoming increasingly cost-prohibitive, with the cost to construct airport hangars increasing by approximately 30 percent over the last

Airport hangars and fuel sales are the predominant sources of revenue generated by Pennsylvania airports, particularly general aviation airports.

New box hangars at New Garden Flying Field courtesy of Fran Strouse

[15] Data and observations in this section were provided by TAC Task Force member and Pennsylvania aviation engineer Fran Strouse.

[16] Box hangars are square or rectangular. T-hangar units have a T-shaped footprint, accommodating more aircraft staggered tail-to-tail in the same building than box hangars.

several years. Current costs to construct a few typical hangar types are significant, as shown in Figure 23.

Figure 23: Typical Hangar Construction Costs, 2022

	Cost		Size (SF)	
	Total	Per Unit	Total	Per Unit
10-Unit T-Hangar	$1,000,000	$100,000	12,000	1,200
5-Unit Box Hangar	$1,300,000	$260,000	18,000	3,600
Clear-Span Hangar	$3,000,000		12,000	

Airport hangar costs are increasing due to several factors.

- National Fire Protection Association Section 409 (NFPA 409): NFPA 409 requires fire suppression for hangars smaller than 12,000 square feet. This increases the cost of hangar construction, adding more than $100,000 to the price of clear-span hangars.
- Environmental: Stormwater regulatory requirements that have been added to land development review add both time and cost to permitting and construction.
- Inflation: Inflation and ongoing supply chain constraints resulting from the COVID-19 pandemic have led to increased costs for labor and materials.
- Local Match Requirements: The 50/50 match on state aviation grant programs is cost-prohibitive for many smaller airports.

Generating increased hangar revenue requires construction of new airport hangars. On average, each general aviation airport in Pennsylvania has a hangar waiting list of 19 aircraft owners.

- Interest Rates: Smaller airports often use loans to supply local matching funds; rising interest rates on conventional bank and Pennsylvania Infrastructure Bank (PIB) loans add to total project costs.
- Separations Act: The Separations Act (71 P.S. §1618) requires public entities to solicit bids and award multiple and separate prime contracts for projects with total costs of construction exceeding $4,000. Compliance adds administrative costs to projects.
- Prevailing Wage Act: The Prevailing Wage Act (43 P.S. § 165-14, Subchapter E) requires prevailing construction wage rates for projects of $25,000 or more when using public funds. This increases labor costs for hangar projects.

Airport Hangars – Alleviating Cost Constraints

Alleviating even a few of the factors listed above would help to reduce costs and allow more hangars to be constructed across Pennsylvania. This TAC study sees the value of strategic public investment in hangars along with the need to address these issues:

NFPA 409

NFPA 409 is being addressed by ACP through legislative support. Efforts are currently underway to introduce legislation deregulating small airport hangar construction. The legislation would provide an exemption on installation of fire suppression equipment in hangars less than 12,000 square feet in size.

Match Requirements

Reducing an airport's match on aviation grants from 50 percent to 25 percent, or developing a sliding scale based on airport size, would make hangar construction more financially feasible for smaller airports. Strategies to improve hangar development throughout Pennsylvania are included in the State Hangar Development sidebar.

Alleviating even a few of the cost constraints would allow more hangars to be constructed across Pennsylvania.

Financing

Financing new airport hangars could be accomplished through a revolving loan program and/or a P3 hangar bundling program.

Hangar Revolving Loan Program

Implementing a hangar revolving loan program could potentially help airports meet match requirements and augment existing grant funding. Minnesota and Nebraska are two of several states that have implemented hangar loan programs to facilitate the construction of airport hangars (see sidebar next page). Other states as described further below include airplane hangars as part of the overall aviation investment portfolio.

A starting framework for a Pennsylvania program could include the following:

- Capitalization of $25 million (approximately $5 million per year over five years), funded by proposed new aviation revenue.
- Maximum loan of $650,000 per airport.
- No-interest loan covering 75 percent of the cost of new hangar construction.
- No-interest loan covering 50 percent of the cost of hangar rehabilitation projects.
- 20-year term with monthly payments.
- 2-year payment deferral.
- Administration by BOA with the approval of PennDOT's Program Management Committee and the P3 Board. All facets of the program's development and execution need to be consistent with the requirements of Act 84 of 2022.

P3 Airport Hangar Bundling

Pennsylvania created a nationwide model when it implemented the $899 million Rapid Bridge Replacement (RBR) Project in 2015. PennDOT developed the program to replace 558 structurally deficient bridges across Pennsylvania. The RBR Project was unique in that it bundled the bridge replacements in a public-private partnership (P3) agreement. The project resulted in a multi-asset, multi-location initiative—a first in the nation.

Pennsylvania's airports are facing a similar challenge, with many older, outdated hangars and a lack of resources to modernize them, and available hangar space lagging behind demand. Finding the resources to develop new hangar space and addressing the increasing challenges to find match dollars for hangar development projects is an issue faced by many airports.

Developing a P3 Airport Hangar Bundling initiative could replace and add new hangars across the state, bringing in additional airport revenue and meeting industry demand. TAC believes that a P3 would be the preferable method of establishing state funding for hangars because hangars are public-sector infrastructure used for private purposes. Further, it believes that a well-designed P3 initiative can leverage additional private-sector investment while generating more operating revenue for airports.

For Pennsylvania, it is important that a P3 approach to hangar development be led by PennDOT's P3 Office with BOA support. Assuming the Pennsylvania Infrastructure Bank might be used as part of the overall program design, the Office of Planning should be involved in this effort as well.

State Hangar Development Programs

Several states have programs to facilitate new hangar construction and hangar rehabilitation. Parameters from three state programs are highlighted below along with implications for Pennsylvania. Based in part on the experiences of other states, TAC recommends that PennDOT establish a hangar development program, ideally following a public-private partnership framework so that state dollars can leverage private funding. TAC recommends that the PA Aviation Hangar Program be funded at $25 million, approximately $5 million per year for five years. Consideration should also be given to using the $25 million in state funding early to leverage as much hangar construction and public-private partnership as possible.

Minnesota State Hangar Loan Revolving Account Program

- 80% no-interest loan for construction of new hangars and site preparation
- 20-year term with monthly payments
- Loan payments capitalize loans for future hangar development
- Current capitalization of $4.4 million
- Since 1959, 209 loans have been issued to construct 1,118 hangars
- Administered through Minnesota Department of Transportation, Aeronautics and Aviation

Nebraska Revolving Hangar Program

- 70% no-interest loan for construction of new hangars
- 50% no-interest loan for rehabilitation of exiting hangars
- Maximum loan of $600,000 per airport
- Repayment period between 5 and 10 years
- Administered by Nebraska Department of Transportation, Division of Aeronautics with approval by Nebraska Aeronautics Commission

Washington Community Aviation Revitalization Board (CARB) Loan Program

- Capitalization of $5 million in 2019
- Additional $5 million authorized in 2021 to meet demand
- 2% interest loan with $750,000 loan maximum to airports with less than 75,000 annual commercial enplanements
- 20-year loan repayment term with up to a three-year repayment grace period
- Eligible projects include hangars, fueling facilities, business parks on airport property, paid parking facilities, passenger amenities, and other revenue-generating or cost-cutting developments
- Administered by Washington State Department of Transportation, Multimodal Deputate with approval by the CARB Board

Implications for Pennsylvania

- With hangars in demand and a revenue source for many Pennsylvania airports, developing a hangar program would be beneficial.
- Attractive elements from other states' programs as determined by Pennsylvania airports should be considered.
- The interaction of a state hangar program with other state incentives should also be considered.
- Airport loan match, an issue for many Pennsylvania airports, should be analyzed with the potential to develop a sliding scale depending on airport or type of hangar improvement.

Solar Generation Revenues
Solar arrays are being installed at airports across the nation to address renewable energy demand created by federal energy policy. Installing solar at an airport requires flat land in proximity to an electric substation, as well as various FAA and local approvals. Due to space requirements, solar power installations on Pennsylvania airports may be limited, but could be profitable.

In addition to addressing energy demand, the solar arrays provide a revenue source for the host airport. The Akron–Canton Airport in Ohio is an example. The airport is leasing 33 acres at $5,700 per acre for installation of a solar array. The lease rate per acre was determined based on fair market value derived as 1/10th the appraised land value. The airport benefits from the value of the ground lease plus electricity operational savings from electric generation and an added tenant revenue source from selling electricity to tenants.

Current solar lease rates in Pennsylvania, primarily from leases on farmland, range between $900 and $1,200 per acre. A solar lease at the appropriate rate per acre could provide a reliable airport revenue stream for 25 to 30 years.[17]

In Schuylkill County, a recently completed Schuylkill County Airport Business Park Feasibility Study included an evaluation of solar potential. Solar lease revenue for a 25-year lease (with options for three- to five-year renewals) is potentially $1,000 per acre per year. A 100-acre site would generate $100,000 in annual revenue.

Microgrid Development
Moving beyond revenue generation, Pittsburgh International Airport developed a microgrid to offset operational costs. Pittsburgh International is the first airport in the

In addition to addressing energy demand, solar arrays provide a revenue source for the host airport. The Akron–Canton Airport in Ohio is leasing 33 acres at $5,700 per acre for installation of a solar array.

[17] Penn State Extension, “Leasing Your Land for Solar Development” Webinar. July 12, 2022.

world completely powered by natural gas and solar energy. Working with natural gas and solar utility partners, the microgrid increases the airport's resiliency and is powered by onsite natural gas wells and 9,360 solar panels on eight acres. The microgrid can produce more than 20 megawatts of electricity. The airport's peak demand is approximately 14 megawatts.[18]

Economic Incentives

Several incentive programs benefit the aviation industry by augmenting local revenue generation and are available to facilitate economic development in airport communities, as highlighted below.

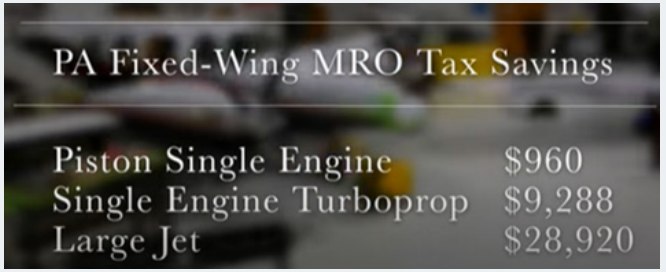
Elimination of the Fixed-Wing Sales Tax
Elimination of the fixed-wing sale tax for aircraft maintenance that was enabled under Act 52 of 2013 provides a sales and use tax exemption for aircraft parts, services to aircraft, and aircraft components. Through this Maintenance, Repair, and Overhaul (MRO) sales tax exemption, the Commonwealth has attracted increased investment in Pennsylvania airports. The tax savings as estimated by DCED in 2015 ranged from hundreds to thousands of dollars per aircraft, depending on type (Figure 24). Prior to the elimination of the MRO tax, Pennsylvania was at a competitive disadvantage compared to surrounding states.

Airport Land Development Zone (ALDZ)
The ALDZ program is the result of legislation passed in July 2022. DCED released program guidelines in November 2022. The program would generate benefits for airports such as the Arnold Palmer Regional Airport in Westmoreland County, where the ALDZ program would facilitate establishing a helicopter refurbishing operation at

[18] Allegheny County Airport Authority, "Pittsburgh International Airport Goes Live with First-of-Its-Kind Microgrid Powering Entire Facility with Natural Gas and Solar Energy." July 14, 2021.

Working with natural gas and solar utility partners, Pittsburgh International Airport's microgrid increases the airport's resiliency.

Figure 24: PA Fixed-Wing MRO Tax Savings



Source: DCED, 2015

the airport. The $5 million project would include the construction of a 120-foot by 150-foot hangar and create 50 new jobs. State grant incentive programs are not attractive for the helicopter refurbishing company due to state prevailing wage requirements for construction.

Keystone Opportunity Zone (KOZ)
Since 1998, the Keystone Opportunity Zone (KOZ) program has been yielding significant economic impacts. As of 2017, some 7,278 jobs were created or sustained and more than $2.6 billion in private capital investment had occurred in KOZ properties throughout Pennsylvania. The program, administered by DCED in conjunction with the Pennsylvania Department of Revenue (Revenue), waives specified state and local taxes for 10 years for eligible businesses located within an approved zone. A KOZ may be extended for 7 or 10 years, if approved.

Foreign Trade Zones
A foreign trade zone (FTZ) is a land located in or adjacent to a United States Port of Entry. A Port of Entry is a designated place at which the United States Customs and Border Protection (CBP) agency is authorized to accept entries of merchandise to collect duties, and to enforce the various provisions of the customs and navigation laws.

- The U.S. Foreign Trade Zones Board (FTZ Board) oversees rules and regulations pertaining to FTZs in conjunction with CBP.
- FTZs offer several advantages for companies using the incentive, with two of the most beneficial being:
  - » CBP duty and federal excise tax, if applicable, paid when the merchandise is moved from the zone for consumption. While in the zone, merchandise is not subject to U.S. duty or excise tax.
  - » Goods may be exported from the zone free of duty and excise tax.

Example Keystone Opportunity Zones

KOZ properties provide an economic incentive for both Harrisburg International Airport and Johnstown-Cambria County Airport. The KOZ properties provide tangible tax savings for eligible businesses.

- Two available KOZ properties totaling 71 acres are located at and adjacent to Harrisburg International Airport and are marketed by the Susquehanna Area Regional Airport Authority (SARAA). The KOZ designation expires December 2023.
- Three KOZ properties totaling 129 acres adjacent to the Johnstown-Cambria County Airport were designated as a KOZ in January 2022. The Johnstown-Cambria County Airport Authority anticipates the KOZ will help attract an MRO facility, among other businesses.

- Encouraging airports to establish FTZs was identified as an opportunity as part of outreach conducted for the 2045 Pennsylvania Freight Movement Plan (FMP).

Additional Incentives

Local incentive programs such as tax incentives or abatements may also be in place and can be offered to attract investment at or surrounding an airport. State or federal infrastructure programs for water, sewer, and roads may also be available to attract investment.

In addition, the Governor's Action Team (GAT) offers company-specific incentive packages for business attraction or retention with additional state-level incentives depending on the company and the magnitude of a specific project. GAT participation is reserved for larger projects and is typically initiated by a local economic development partner or through a statewide site selection consultant or company search.

courtesy of Philadelphia International Airport

Strategic Actions – Economic Impact/Economic Development

1. **Market the value of Pennsylvania airports as an industry and economic asset.**

   a. Develop a marketing profile emphasizing those assets that set Pennsylvania's aviation industry apart, e.g., number of airports, location, transportation connections, economic impact, infrastructure, shovel-ready sites on or near airports, etc.

   b. Formalize assistance among aviation partners (PennDOT's Bureau of Aviation (BOA), the Aviation Council of Pennsylvania, airports); economic development partners such as the PA Department of Community and Economic Development (DCED), Pennsylvania Economic Development Association (PEDA) membership, and Partnerships for Regional Economic Performance (PREP) regions; and tourism promotion agencies to deliver an aviation message, based on the marketing profile, uniformly and consistently throughout Pennsylvania and beyond.

2. **Support existing and develop new incentive programs to encourage economic development at and surrounding Pennsylvania's airports.**

   a. Facilitate implementation of the new Airport Land Development Zone (ALDZ) program.

   b. Develop a public-private partnership (P3) hangar bundling initiative to increase the availability of hangars throughout Pennsylvania. The hangar development program should be developed drawing on the joint expertise of PennDOT's P3 Office and the Bureau of Aviation.

   c. Alternatively, develop a Pennsylvania Airport Hangar Revolving Loan Fund (PAH-RLF) capitalized with a $25 million Commonwealth investment.

   d. Market the use of existing incentive programs at Pennsylvania airports such as Foreign Trade Zones (FTZs) and the Maintenance, Repair, and Overhaul (MRO) sales tax exemption.

Airports and Communities/Land Use

Issue In Brief

Land use planning and zoning have impacts on local airport development, and vice versa. Protecting and preserving the Commonwealth's aviation infrastructure while protecting public health, safety, and welfare was deemed important when airport hazard zoning (AHZ) was enacted in 1984 through Act 164, yet less than half of municipalities subject to the zoning are compliant. Airport hazard zoning is a common-sense safety action in which local jurisdictions control the height of any structures that could interfere with safe aviation operations.

Connecting Pennsylvania's airports and the surrounding community in terms of land use regulation, economic development, and public engagement leads to mutually beneficial outcomes. With limited resources and competing interests at all levels of government and in all industries, leveraging limited resources through improved community connections is necessary.

Situation Analysis

Airport Planning and Zoning Requirements

The Pennsylvania Municipalities Planning Code (MPC) is the legal authority for planning in Pennsylvania. It specifies the requirements and processes to adopt comprehensive plans and land use ordinances such as zoning and subdivision and land development.

The MPC requires counties, through a county comprehensive plan, to identify current and proposed land uses having a regional impact and significance, which includes airports. The MPC requires zoning ordinances be designed to promote, protect, and facilitate airports.

courtesy of Susquehanna Area Regional Airport Authority

The MPC does not, however, require municipalities to adopt zoning. "The governing body of each municipality, in accordance with the conditions and procedures set forth in this act, *may* enact, amend and repeal zoning ordinances…"[19] According to the *2020 State Land Use and Growth Management Report* prepared by the Pennsylvania Department of Community and Economic Development (DCED), 32 percent of Pennsylvania's municipalities do not have zoning.[20]

To further protect and preserve Pennsylvania's aviation facilities and protect public health, safety, and welfare, the Commonwealth enacted Airport Hazard Zoning and Compatible Land Use through Act 164, Chapter 59, Airport Operation and Zoning.

BOA conducted a series of workshops throughout Pennsylvania in 2010 and 2011 to increase AHZ compliance. The outreach included review of BOA-developed traditional and overlay AHZ model ordinances to ease the burden on municipalities of Act 164 compliance. As of 2020, AHZ compliance for commercial service and general aviation airports combined was 46.6 percent, as shown on Figure 25.

As of 2020, Airport Hazard Zoning compliance for commercial service and general aviation airports combined was 46.6 percent.

[19] Pennsylvania Municipalities Planning Code, Act 247 of 1968.
[20] PA DCED, *2020 State Land Use and Growth Management Report*, Executive Summary.

Figure 25: Airport Hazard Zoning Compliance

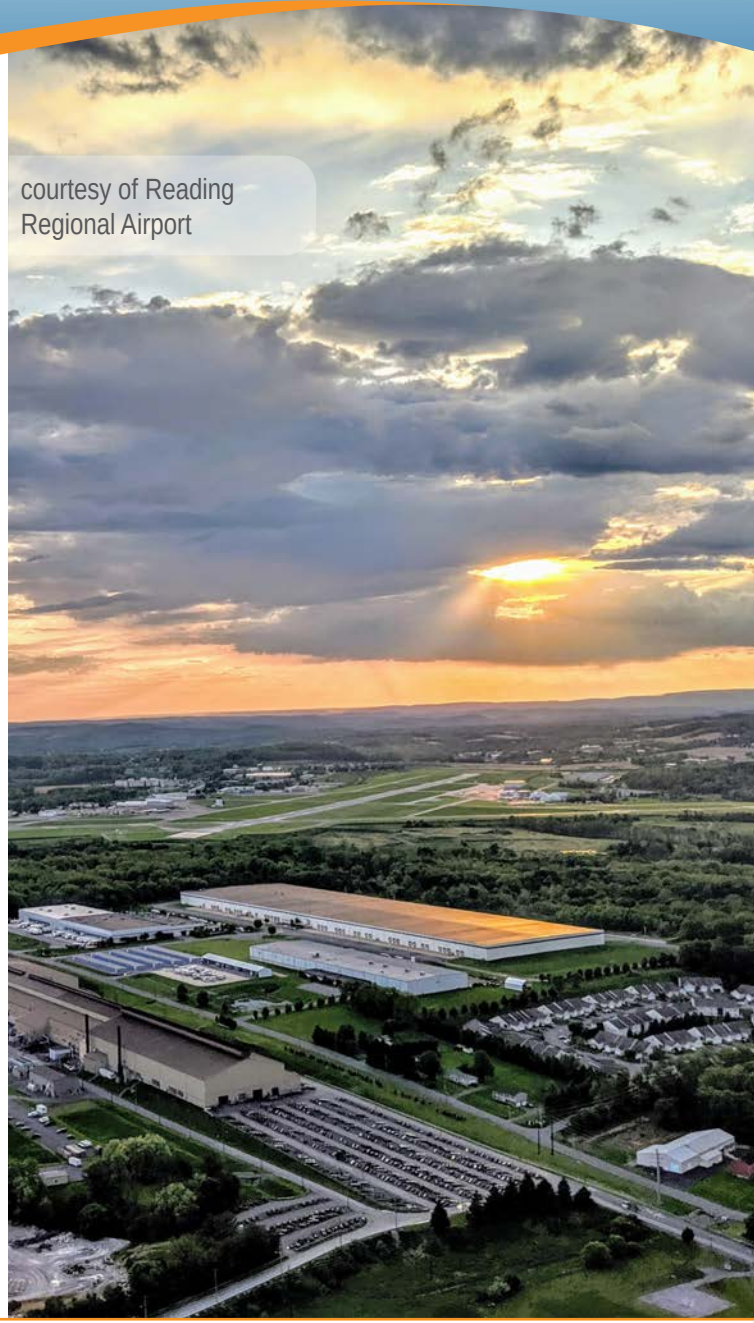
Number of Airports	Number of Municipalities	Act 164 Ordinance in Place	Percent Compliance
Commercial Service Airports			
14	224	97	43.3%
General Aviation Airports			
107	535	257	48.0%
Total			
121	759	354	46.6%

Source: PennDOT Bureau of Aviation, 2020

A few barriers to enacting AHZ were identified by airport managers:

- Lack of municipal capacity to prepare and pay for a zoning ordinance
- Lack of municipal zoning
- Lack of airport capacity to conduct annual outreach with municipalities

Some airport managers have been proactive in improving AHZ compliance in rural municipalities without zoning. For example, when faced with lack of municipal zoning in five affected municipalities surrounding the Bedford County Airport, and implications due to erection of cell towers on local ridgelines, the airport manager encouraged Bedford County to adopt a form of height restriction zoning to protect operations at the airport. This workable, creative solution resulted from the proactive efforts of the airport manager.


courtesy of Reading Regional Airport

Similarly, Lehigh Valley Planning Commission (LVPC) has assisted in ensuring AHZ compliance by reviewing for airspace as building heights and densities increase regionwide. All development plans in the airport hazard area are reviewed by LVPC with municipal guidance provided as needed. The Lehigh-Northampton Airport Authority (LNAA) helps with compliance as well.

Airport Master Plans and Strategic Plans

Airport hazard zoning and land use regulations provide for airport safety but do not prepare an airport for future growth as outlined in an airport master plan or strategic plan. Some, but not all, Pennsylvania airports have the capacity and financial resources to prepare a master plan, and a few prepare strategic plans. Working with local, county, and regional planning agencies will ensure an airport is strategically incorporated into local and regional land use planning strategies and vice versa. Maintaining and sustaining Pennsylvania's airports requires master plans and strategic plans to be regularly updated to reflect changing conditions. Basic strategic planning, scaled to airport size, would be valuable.

Airports and Their Host Community

Effective airport regulation and planning requires an airport to be connected to its host community. Knowing the goals of local government officials and the general public will help an airport contribute as a valued community asset. Ensuring local government officials and the general public know an airport's goals and the value of the airport as a community asset will strengthen the connection with the community, leading to mutually beneficial outcomes. Overall, airport administration through airport managers and airport authorities needs to have a better understanding of local government and citizen needs, and local governments and citizens need to have a better understanding of airport operations.

Land Use Regulatory Changes Prompted by Aviation

Aviation-related land use changes resulting from the burgeoning UAS industry, vertiports to facilitate vertical takeoff and landing (VTOL) operations, and trends such as high-cube warehousing, are relatively new to Pennsylvania. Ensuring Pennsylvania stays on top of aviation-related land use trends and incorporates appropriate changes into local regulations and state legislation, as required, will ensure high safety standards are being met while encouraging industry advancement and growth.

Strategic Actions – Airports and Communities/Land Use

1. **Increase compliance with Airport Hazard Zoning (AHZ).**
    a. Document current AHZ compliance.
    b. Develop follow-up outreach to BOA's 2010–2011 outreach campaign.
    c. Brief county and regional planners on AHZ requirements and solicit their assistance in working with municipalities and airports to adopt zoning.
    d. Consider options for requiring airport hazard zoning over a phased-in period of time, e.g., two to three years for compliance. Provide the technical assistance needed in the interim to help bring municipalities into compliance.
    e. Establish recognition programs with high profiling of airports and communities that effectively collaborate in carrying out AHZ and other efforts. Tie this recognition to other actions such as technical assistance.
    f. Consider making AHZ a focus of PennDOT Connects with its emphasis on PennDOT and community collaboration.
    g. Address AHZ compliance with the State Planning Board as a potentially helpful forum for problem-solving and increasing awareness of the need and benefit of AHZ.

2. **Continually monitor land use changes prompted by airports and advance legislative and regulatory changes, as required.**
    a. Work with airports to brief local, county, and regional planners on aviation land use changes. Establish a basic protocol or guide for doing this consistently throughout the Commonwealth.
    b. Identify needed regulatory changes on an ongoing basis and bring to the attention of the State Planning Board.
    c. Advance legislative and regulatory changes on an as-needed basis.

3. **Expand airport manager knowledge on how to effectively work with communities.**
    a. Develop an AirTAP to provide technical assistance for airport managers to improve their planning skills and to work more effectively with communities. Implementing a course similar to NC AirTAP's "Airport Public Relations and Communications," part of its statewide Airport Leadership and Management Program (ALMP) certification, would improve connections between airports and communities.

Air Freight

Issue in Brief

For Pennsylvania to be economically competitive in transporting air freight, cargo transport trends, issues, and needs must be better understood and evaluated. Air cargo demand continues to grow and cargo delivery methods continue to evolve. Several of Pennsylvania's airports are expanding or need to expand within their limitations—and they cannot do it alone. Cargo expansion requires not only federal investment, but state, regional, and private investment as well—whether that be monetary or otherwise.

Several of Pennsylvania's airports have already broken ground to expand their cargo operations; however, there are also implications for other components of the state's transportation network as a whole. While many agencies have a general understanding of freight transported by truck and rail, air cargo is not as strongly connected in state and regional planning and other capital initiatives.

Situation Analysis

Air Cargo Demand

According to data from the USDOT Bureau of Transportation Statistics (BTS), air cargo demand in the United States increased 39 percent from 2011 to 2021 (Figure 26). In 2022, domestic air cargo demand has shown a slight decline while international demand has shown growth (Figure 27). In addition to the rise of e-commerce, growth in manufacturing and industrial production is also changing the landscape for air cargo demand. This is evident in regions such as South Central Pennsylvania and the Lehigh Valley, where extensive manufacturing facilities and growth in distribution and warehousing are leading to higher levels of freight.

Harrisburg International Airport courtesy of Susquehanna Area Regional Airport Authority

Figure 26: Change in U.S. Air Cargo Revenue Ton-Miles* (in millions), 2011-21

	Domestic		International		Total
2011 Total	2,133.73	18.8%	52,534.25	81.2%	64,667.98
2021 Total	20,150.42	22.4%	69,750.31	77.6%	89,900.73
Percent Change over 2011	66.1%		32.8%		39.0%
2022 YTD	1,589.90	23.0%	5,336.61	77.0%	6,926.51
Percent Change over 2021 YTD	-0.94%		8.81%		0.83%

*A cargo revenue ton-mile is one ton of revenue cargo (freight or mail) carried for one mile. Data includes all U.S. airlines of all service classes (scheduled and non-scheduled).
Source: Bureau of Transportation Statistics, T-100 Segment Data

In Pennsylvania, most air cargo is handled at the state's 14 commercial service airports—airports with regularly scheduled service and a minimum of 2,500 passenger boardings per year. Cargo hubs in Pennsylvania are typically located in the state's major metropolitan areas with access to aviation facilities that have sufficient capacity to handle large aircraft, are in proximity to a large population base, and have nearby industrial property for cargo handling. Key industries in Pennsylvania that rely on air transportation for cargo movement include technology/biotechnology, pharmaceuticals, and overnight parcel delivery. These industries and their respective commodities line up closely with the trend of air cargo services being most used for lower-weight, time-sensitive, high-value shipments.

In 2020, Philadelphia International Airport ranked 15th in the nation for landed cargo weight with 3.1 billion pounds of cargo, according to FAA data. Per the same dataset, Lehigh Valley handled 574.4 million pounds, Pittsburgh handled 547.8 million pounds,

Air cargo demand in the United States increased 39 percent from 2011 to 2021.

Key industries in Pennsylvania that rely on air transportation for cargo movement include technology/biotechnology, pharmaceuticals, and overnight parcel delivery.

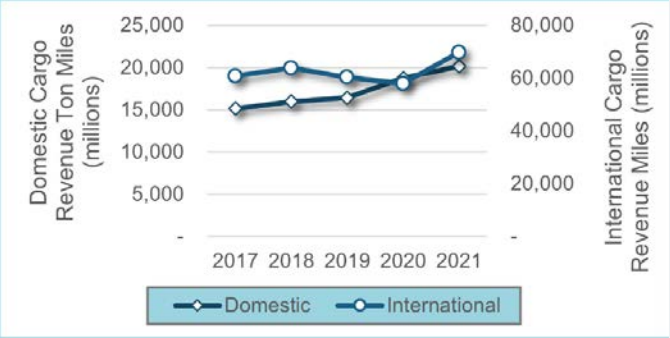
and Harrisburg handled 448.3 million pounds. An air cargo focus group held during the development of Pennsylvania's 2045 Freight Movement Plan (FMP) noted that most cargo activity at the state's "smaller" airports is attributed to parcel delivery through FedEx and UPS.

COVID-19 Pandemic Challenges and Recovery

National trends in the past five years show growth and recovery from the impacts of the COVID-19 pandemic, which took its worst toll on PA aviation in 2020 (Figure 27). Despite the challenges faced by aviation throughout the pandemic, the air cargo industry proved it was able to adapt quickly and remain resilient as a critical societal lifeline. International cargo demand has recovered from declines due to strict travel restrictions and border closures. Domestic cargo demand experienced the opposite effect, notably increasing during the pandemic, as Americans relied on e-commerce and fast delivery due to stay-at-home orders, social distancing, and non-essential business closures. Domestic cargo demand continues to increase as the U.S. moves to post-pandemic conditions.

In addition to impacts on air cargo demand, a report by the National Academies Press, entitled *Aviation After a Year of Pandemic: Economics, People, and Technology,* notes that air cargo made up 30 percent of global airline revenue in 2020—a 10 percent increase from the previous year.[21] Per an air cargo focus group conducted for Pennsylvania's Freight Movement Plan (2022), airports handling air cargo also saw reductions in belly cargo movements when passenger volumes declined, which mirrors national trends.

Figure 27: U.S. Domestic and International Air Cargo Demand, 2017-21



Source: Bureau of Transportation Statistics – T-100 Segment Data

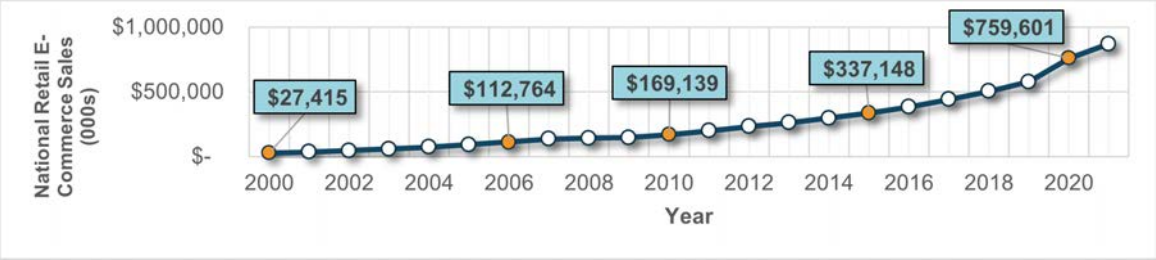
Despite the challenges faced by aviation throughout the pandemic, the air cargo industry proved it was able to adapt quickly and remain resilient as a critical societal lifeline.

[21] https://nap.nationalacademies.org/catalog/26375/aviation-after-a-year-of-pandemic-economics-people-and-technology

Growth in E-Commerce

In the past decade, e-commerce has increased (Figure 28), along with consumer expectations for delivery speed and convenience. To meet this growing demand, air cargo operations have had to become agile as they provide a way to deliver time-sensitive shipments quickly. According to the U.S. Census Bureau's *Quarterly Retail E-Commerce Sales Report*, e-commerce accounted for 13.2 percent of all retail sales in the U.S. in 2021, totaling more than $870 billion—a 14.2 percent increase from 2020 sales. McKinsey and Company predicts that e-commerce will continue to grow by 10 to 15 percent per year in the next five to 10 years, making up a larger share of national retail e-commerce sales.[22] The National Academies Press report notes that the acceleration of e-commerce growth due to the pandemic has caused e-commerce giants such as Amazon to reevaluate their shipping and distribution networks (e.g., Prime Air). In an international context, these companies are starting to shift from transporting goods via container ship or other mode to more frequent, smaller shipments by air.

Figure 28: U.S. Retail E-Commerce Sales, 2000-21



Source: U.S. Census Bureau – Retail Indicators Branch

[22] http://www.ecommena.com/downloads/speaker-presentations/Rachid%20Maalouli-%20Mckinsey.pdf

E-commerce accounted for 13.2 percent of all retail sales in the U.S. in 2021, totaling more than $870 billion—a 14.2 percent increase from 2020 sales.

E-Commerce Boom Affecting Pennsylvania

The Lehigh Valley area has been experiencing acute effects of e-commerce growth and development. In 2021, Lehigh Valley International Airport handled nearly 232 million pounds of cargo—nearly five times the 2015 value of 47 million pounds.[23] The change is attributed to the area's growth in e-commerce-focused development, notably with the addition of Amazon Prime Air in 2015 and the expansion of FedEx Express facilities.[24]

[23] https://www.flyabe.com/media-center/airport-news/a-year-of-resurgence/
[24] https://www.mcall.com/business/mc-lehigh-northampton-airport-cargo-20170131-story.html

Air Cargo Capacity Constraints and Expansion

At the same time that demand is increasing within the air cargo industry, cargo capacity is being stretched thin due to the slow recovery of international travel and reduced levels of "belly cargo" transported post-pandemic, according to sources from Maersk and the International Air Transport Association (IATA).[25, 26] Additionally, congestion and pressures on other freight modes (e.g., container ships) have caused shippers to turn to air as a primary shipping mode. A Journal of Commerce article notes that freight forwarders and shippers are trying to improve the reliability of air cargo shipments by dedicating capacity within their own fleets, rather than leverage "flexible shared capacity with commercial airlines." The report from the National Academies Press, *Aviation After a Year of Pandemic: Economics, People, and Technology*, also noted that while the use of combination aircraft (planes serving both passenger and cargo functions) may help with cargo capacity in the near term, it will not be as helpful as a mid- to long-term solution to address capacity constraints.

According to an air cargo focus group conducted for Pennsylvania's Freight Movement Plan (2022), several of the state's airports are prioritizing investments in airport infrastructure (e.g., aprons, landside access roads, and cargo buildings/hangars) to support the growing demand for cargo. The sidebars on this and the following page provide examples of cargo investments occurring in Pennsylvania.

Hours in which airports run cargo operations vary. While PHL handles cargo 24 hours a day, cargo at other airports such as HIA operates when commercial passenger flights do not.

[25] https://www.joc.com/air-cargo/no-return-air-cargo-capacity-pre-pandemic-levels-maersk_20211210.html
[26] https://www.joc.com/air-cargo/travel-restrictions-keep-air-cargo-capacity-tight_20200728.html

Pittsburgh International Airport (PIT)

The airport was approved for a $2.4 million grant from the state's Aviation Transportation Assistance Program to prepare for air cargo development projects. This includes aircraft and vehicle parking and environmental remediation, among other improvements, to prepare for cargo expansion.

Harrisburg International Airport (MDT)

Air cargo plays a significant role in the South Central PA region with high rates of manufacturing and warehousing growth. To mitigate existing air cargo capacity constraints and to accommodate increases in manufacturing and production, Harrisburg International Airport (HIA) is expanding its air cargo capacity through a $60 million expansion project. With cargo forecasted to increase to 70,000 tons by 2033,[27] the expansion is expected to include both airside and landside improvements to better serve cargo operations, largely provided by UPS, FedEx, and DHL. These include stormwater improvements, demolition of several buildings, realignment of two roadways, expansions of cargo aprons and aircraft parking, and a second air cargo building. Cargo carriers will be able to work more efficiently and have additional space to expand. The project will increase the airport's cargo capacity by 30 percent and will create 350 permanent jobs and 500 construction jobs.

[27] https://www.flyhia.com/airport-authority/master-plan/

Changes in Fuel and Shipping Costs

Air transportation continues to be the fastest, but most costly, way to ship freight. It is ideal for high-value, low-weight shipments. In recent years, particularly during the pandemic, shipping rates have been volatile, which continues to be a challenge for air cargo operations. According to Boeing's World Air Cargo Forecast (2020-2039), cargo operators add surcharges for fuel as a way of alleviating high costs; however, "large pricing swings can contribute to market uncertainty, discouraging shippers from using air transport and obscuring efficiencies over time."[28]

Shifts in Markets and Service

For many types of cargo delivery, there has been a shift from shipping cargo on dedicated air freighters to shipping as "belly cargo"—cargo carried on scheduled passenger flights. As a result, air cargo in the United States has shifted from a small number of hubs to a wider range of airports that also handle high passenger volumes. Additionally, many shippers are transitioning to an "end-to-end" service approach over "airport-to-airport" service, creating partnerships between shippers and airlines.

Employee Recruitment and Retention

As Pennsylvania's cargo airports continue to expand and manufacturing/warehousing developments continue, there is a need to recruit and retain employees for both the expanded cargo operations and other local freight businesses. In addition, seasonal employees are usually necessary to handle the holiday rush. Nationally, airports such as Atlanta and Dallas/Fort Worth struggle to hire sufficient ground handlers for expanded operations as demand outpaces supply and e-commerce growth continues

Philadelphia International Airport

In 2020, Philadelphia International Airport (PHL) handled more than 623,000 tons of freight and mail, heading for both domestic and international destinations. Cargo operations include 10 cargo carriers (including those shipping via belly cargo) and several freight forwarders operating within 600,000 square feet of cargo building space. With the help of funds from the new Bipartisan Infrastructure Law (BIL), PHL is moving forward with an expansion of its air cargo operations to further broaden its cargo reach. The City of Philadelphia is expected to receive $30.7 million in federal funding through BIL, which will help partially fund the $1.2 billion expansion project. According to an article posted on the airport's website, the airport's cargo facility footprint will expand to 1.4 million square feet of building space and 136 acres of land. This includes 1 million square feet of new cargo building space along with taxiway and apron expansions. The expansion project is expected to contribute $870 million in regional economic impact along with the creation of 6,000 permanent jobs as well as 5,000 construction jobs annually.

[28] https://www.boeing.com/commercial/market/cargo-forecast/

to accelerate. To help find labor, some of Pennsylvania's airports (e.g., HIA) host career fairs for jobs with carriers on-site as well as at growing businesses in the region.

Increasing Investment in Air Cargo

Foreign Trade Zones

As defined by U.S. Customs and Border Protection, a Foreign Trade Zone (FTZ) is a "secure area under U.S. Customs and Border Protection supervision that is generally considered outside CBP territory upon activation."[29] By removing CBP intervention, international freight is moved through a more streamlined process.

FTZs offer benefits to both private industry as well as the public. For private businesses and industry, this includes deferral, exemption, or reduction of federal excise taxes and customs duties; a reduction in merchandise processing fees; and lower transportation costs. For the public, benefits include increased domestic economic competitiveness, retention of domestic businesses, enhancement of economic development programs, job creation, facilitation of exports, and expedited international trade.[30] Pennsylvania has eight FTZs located at or near a port of entry, listed in Figure 29.

[29] https://www.cbp.gov/border-security/ports-entry/cargo-security/cargo-control/foreign-trade-zones/about
[30] https://www.crowley.com/ftz-guide/

Figure 29: PA Foreign Trade Zones at or Near a Port of Entry

Grantee	Location	Service Area	Port of Entry
Eastern Distribution Center, Inc.	Pittston	N/A	Wilkes-Barre/Scranton
Regional Industrial Development Corporation of Southwestern Pennsylvania	Pittsburgh	Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Somerset, Washington, and Westmoreland counties	Pittsburgh
Philadelphia Regional Port Authority	Philadelphia	Philadelphia, Delaware, Bucks, Montgomery, Chester, Lancaster, and Berks counties	Philadelphia International Airport
FTZ Corp of Southern Pennsylvania	Berks County	Adams, Berks, Cumberland, Dauphin, Franklin, Fulton, Juniata, Lancaster, Lebanon, Perry, and York counties	Harrisburg
Erie-Western Pennsylvania Port Authority	Erie	N/A	Erie
North Central Pennsylvania Regional Planning and Development Commission	Jefferson County	Cameron, Clearfield, Elk, Jefferson, McKean, and Potter counties	Pittsburgh
Lehigh Valley Economic Development Corporation	Lehigh Valley	Lehigh and Northampton counties	Lehigh Valley
Pennsylvania Foreign Trade Zone Corporation	Central Pennsylvania	Bedford, Blair, and Cambria counties	Pittsburgh

Source: International Trade Administration

Intermodal Connections: Planning for Air Cargo

During the TAC regional listening sessions, aviation stakeholders emphasized the importance to air cargo operations of intermodal connectivity, noting that most cargo is moving longer distances rather than to a nearby destination.

There is an opportunity for greater involvement of aviation representatives in regional planning initiatives with the state's MPOs/RPOs as well as state agency boards, advisory groups, and task forces. This collaboration facilitates the development of new approaches to interconnectivity.

Regional and state agencies can support airport efforts while obtaining a greater understanding what airports and authorities do for the larger transportation network. While many agencies have a solid understanding of highway modes, transit, and rail, aviation is not as strongly connected. This collaboration could also foster stronger linkages among cargo, land use, and economic development.

Strategic Actions – Air Freight

1. **Assess the local/regional business needs for air cargo services to align businesses with future air cargo opportunities.**

    a. Explore opportunities to deploy Foreign Trade Zones (FTZs) to increase economic investment in air cargo and warehousing near Pennsylvania's airports.

    b. Identify business needs pertaining to aviation in partnership with PA DCED and the state's PREP regions via the Engage! program.

2. **Develop a guide for air cargo analysis and integration with planning application at the state and regional levels.** In developing the guide, determine the various data sources available to better address air cargo as an element of regional and statewide transportation planning. Determine if there are any states to benchmark in this dynamic transportation sector.

3. **Engage aviation stakeholders in the updates of state and regional freight plans and studies to encourage new, collaborative approaches to intermodal connectivity and to foster stronger linkages among cargo, land use, and economic development.**

    a. Evaluate ground access/connections to maximize efficiency and reduce local roadway system impacts.

Commercial Air Service

Issue in Brief

While largely driven by the market and decisions of commercial airlines, commercial air service is obviously an important contributor to both the state and local economies as well as communities. Community residents enjoy the convenience of access via a local airport for their long-distance travel needs, whether that be for leisure or business. Without this access or a desired type of service, travelers leave the community to access air service in a neighboring region or even outside of Pennsylvania. Airline staffing shortages and loss of federal subsidies make smaller regional airports more vulnerable to the loss of air service. Commercial air service was greatly affected by the COVID-19 pandemic, which has led to new uncertainties in the future of business travel via Pennsylvania's airports.

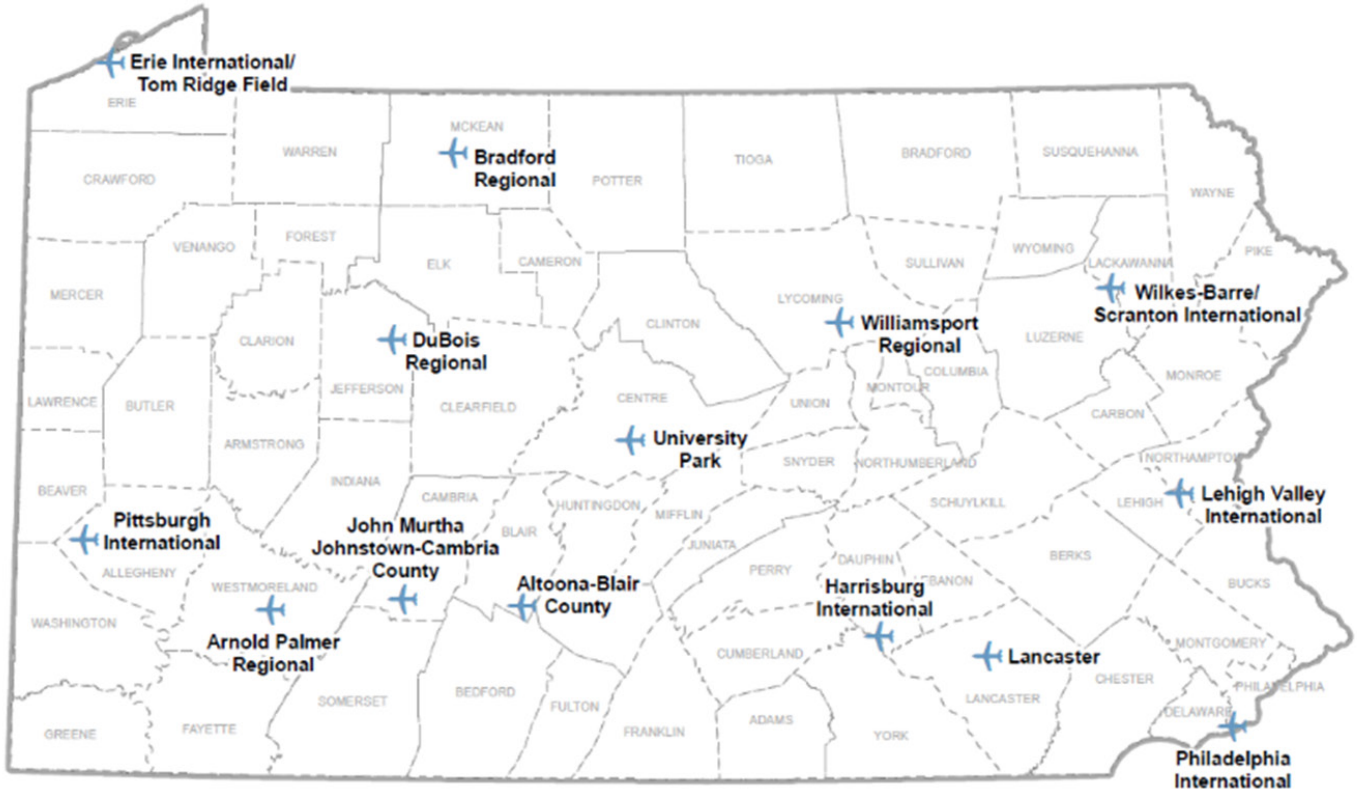
Situation Analysis

Pennsylvania is home to 14 commercial service airports (Figure 30), defined as providing regularly scheduled service and a minimum of 2,500 passenger boardings per year. Of these airports, nine are nationally categorized at "primary" hub airports with more than 10,000 passenger enplanements per year, while the remaining five are categorized as "non-primary."

Over the past decade (2009-2019), enplanements at Pennsylvania's commercial service airports (both primary and non-primary hubs) remained steady, at an average of 20.7 million passengers each year (Figure 31). As of 2019, Philadelphia International Airport continued to handle the most passenger enplanements in the state (16 million), followed by Pittsburgh (4.7 million), Harrisburg (746,300), Lehigh Valley (434,000), and Wilkes-Barre Scranton (289,000).

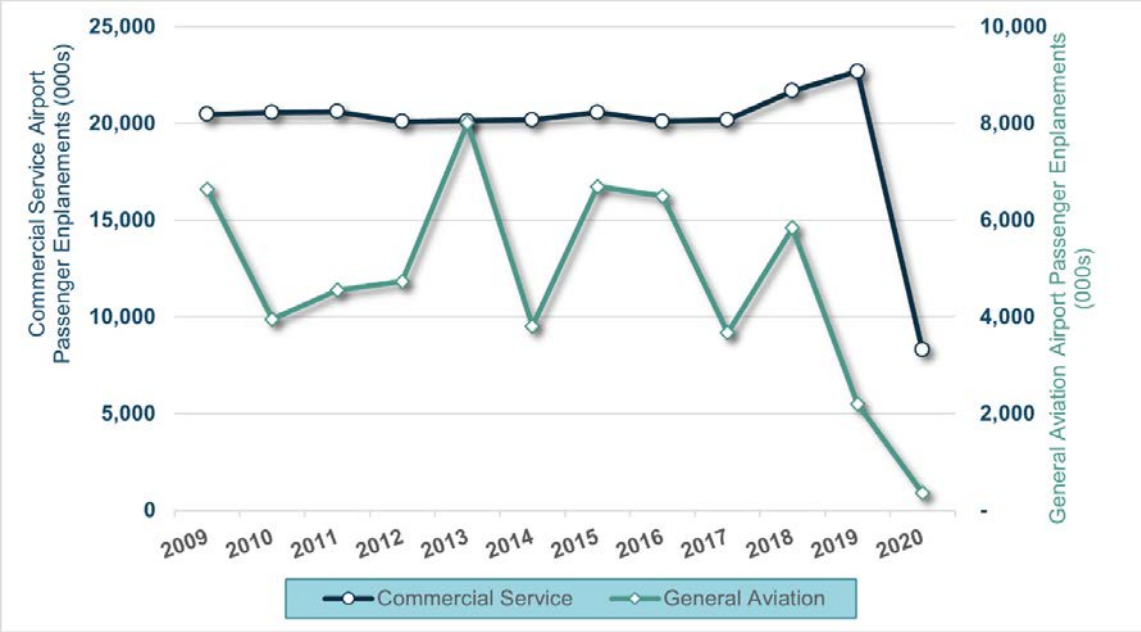
courtesy of Philadelphia International Airport

Figure 30: Pennsylvania's Commercial Service Airports



The state's general aviation airports averaged more than 5,000 enplanements per year over the same time period, with trends showing "boom and bust" cycles and recent declines. The aviation industry, notably passenger service, was significantly impacted by the COVID-19 pandemic, resulting in the state's commercial service airports experiencing a drop of more than 60 percent from 2019 enplanement levels.

Figure 31: Statewide Commercial Service and General Aviation Enplanements 2009-21



Source: Federal Aviation Administration

State of Commercial Air Service (Fall 2022)

- In 2019, Venango Regional Airport (Franklin) lost its Essential Air Service (EAS) subsidy. Despite this loss, the airport still receives inquiries from customers regarding commercial service and the airport is actively looking to offset revenue losses through other contracts and mechanisms.
- In November 2021, American Airlines ended its service from Williamsport Regional Airport to Philadelphia International Airport. American was the only carrier serving Williamsport. Airport officials are working to recruit a new airline; however, passengers now have to travel to other surrounding airports to get to their final destination.
- In March 2022, SkyWest Airlines (an express carrier for United Airlines) announced that it would terminate 29 EAS contracts due to pilot shortages—one of which was with John Murtha Johnstown-Cambria County Airport. Since the announcement, Johnstown-Cambria County Airport Authority and SkyWest have reached an agreement to continue service, which was still being reviewed by the US Department of Transportation as of June 2022. The airport authority has also met with representatives of Allegiant Airlines to market the airport for service and is awaiting a decision from the low-cost carrier. https://www.tribdem.com/news/johnstown-airport-leaders-back-skywests-bid-to-continue-service/article_811c87fa-f1aa-11ec-8227-33983049ec37.html
- In August 2022, it was announced that American Airlines would eliminate more than 1,800 domestic flights at Philadelphia International Airport starting in September. The airline cited labor shortages and rising travel demand. PHL serves as American Airlines' Northeast hub. https://www.nbcphiladelphia.com/news/transportation-and-transit/american-airlines-cutting-more-than-1800-phl-flights-this-fall/3325400/

Vulnerability to Loss of Service: Pilot Shortages and Labor Impacts

As of April 2022, Pennsylvania had a total of 29,333 active pilots based in the state. Nationwide, pilot demand is outpacing supply—a trend that accelerated during the COVID-19 pandemic due to furloughs and layoffs. The pilot shortage has led to reductions or cancellations in commercial air service across the nation. In addition to COVID-19 impacts, many of the nation's pilots have reached the FAA's mandatory retirement age of 65, set in FAA Part 121. Inflation is increasing the cost for commercial airlines to hire new pilots to address the shortage.

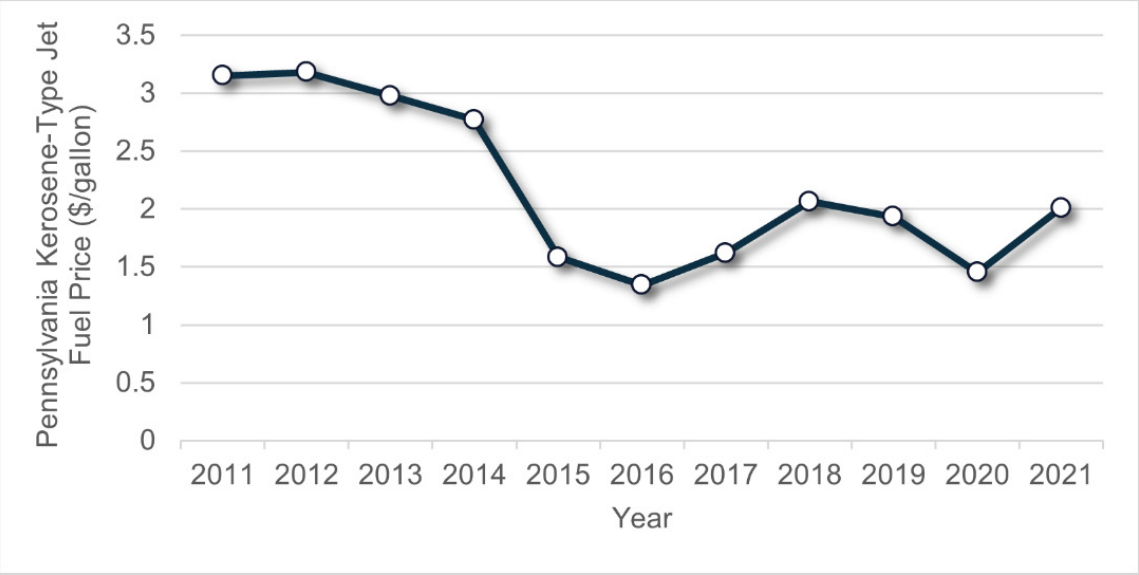
In addition to pilot shortages, other core job categories within the airline industry are experiencing shortages and hiring struggles. This poses challenges in operating larger aircraft, which require a larger crew. The labor shortages are contributing to a shift to fleets of fewer, smaller aircraft that provide more frequent trips.

The pilot shortage has led to reductions or cancellations in commercial air service across the nation.

Oil and Jet Fuel Costs

Oil and jet fuel costs have continued to show volatility in recent years (Figure 32). According to an article in *Executive Flyers*, jet fuel costs account for 10 to 20 percent of an airline's operating expenses.

Figure 32: PA Kerosene-Type Jet Fuel Wholesale/Resale Price by Refiners, 2011-21



Source: U.S. Energy Information Administration

Fuel alternatives continue to be researched, and electric/hybrid aircraft are proving to be a near-future consideration at airlines such as American and Delta. While alternative fuels may alleviate the impacts of elevated fuel costs for airlines, airports and their public-sector partners will need to invest in the infrastructure to support, maintain,

While alternative fuels may alleviate the impacts of elevated fuel costs for airlines, airports and their public-sector partners will need to invest in the infrastructure to support, maintain, and operate alternatively fueled aircraft.

The shift to alternative fuels may impact the future viability of the Jet Fuel Tax as a revenue source for Pennsylvania's aviation system.

and operate alternatively fueled aircraft. The shift to alternative fuels may also impact the future viability of the Jet Fuel Tax as a revenue source for Pennsylvania's aviation system. Future funding strategies will need to consider the evolution of alternative fuels within the aviation industry.

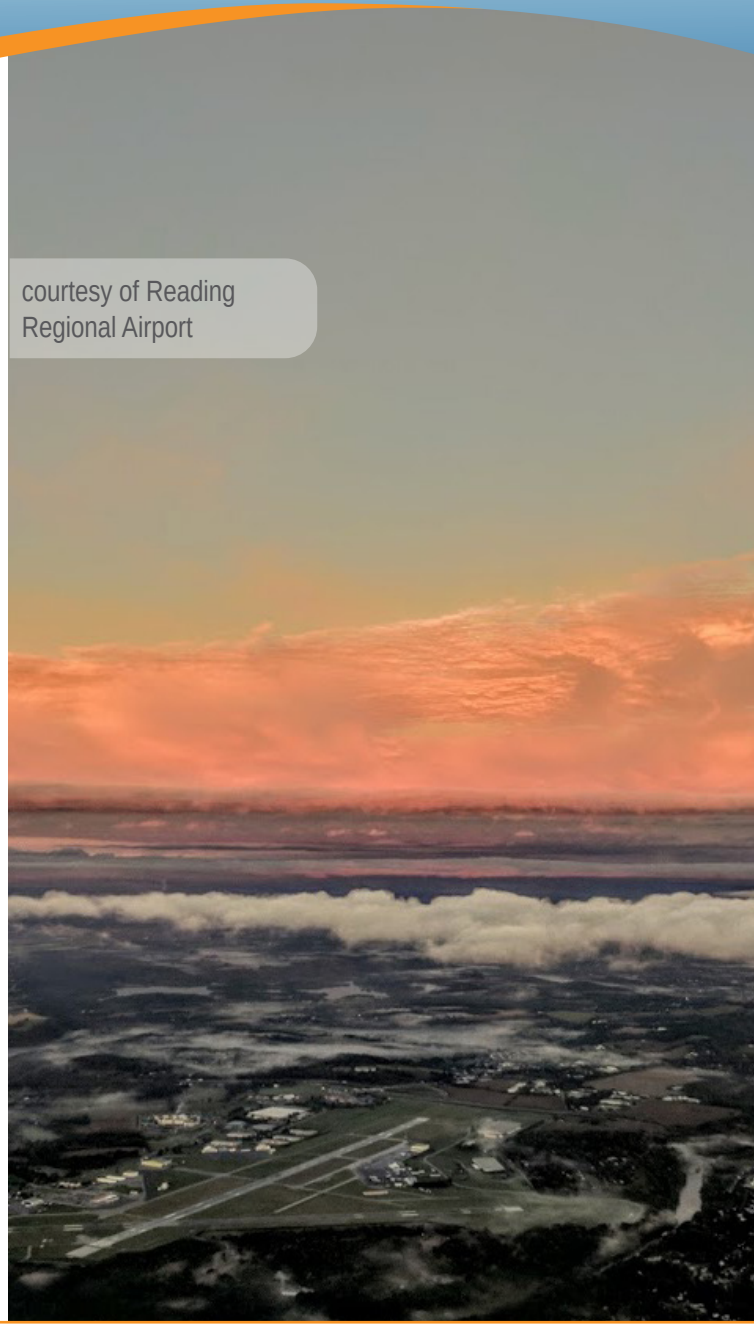
Connecting Smaller, Rural Communities

Essential Air Service

The Essential Air Service (EAS) program was enacted in response to the Airline Deregulation Act of 1978, which allowed airlines to decide where they provide service and gave them the ability to set their own fares. The program offers government-funded subsidies for 115 smaller airports nationwide to retain commercial service connections to larger "hub" airports on the National Air Transportation System. The USDOT sets a minimum number of round trips that commercial airlines need to provide from EAS airports to another commercial service airport on the national network.

Air carriers providing EAS to these communities are selected through the US Department of Transportation's competitive bidding process and are usually granted a two- or four-year contract for service. Upon receiving proposals from airlines interested in providing EAS to a specific community, USDOT bases its selection on community input, subsidy requirements, and five criteria:[31]

1. Demonstrated reliability in providing scheduled air service;
2. Contractual and marketing arrangements the applicant has made with a large carrier to ensure service beyond the hub airport;
3. Interline agreements that the applicant has made with larger carriers to allow



courtesy of Reading Regional Airport

[31] https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/essential-air-service

passengers and cargo of the applicant at the hub airport to be transported by larger carriers through one reservation, ticket, and baggage check-in;

4. Preferences of the actual and potential users of air transportation at the eligible place, giving substantial weight to the views of elected officials representing users of the service; and
5. The air carrier includes a plan in its proposal to market its service to the community.

According to Pennsylvania's 2045 Long Range Transportation Plan (LRTP), as of 2021 there were six airports in the state that received subsidies under this program (Altoona, Bradford, DuBois, Venango, Johnstown, and Lancaster); however, some of these airports have recently lost or could lose their EAS status (e.g., Venango).

Small Community Air Service Development Program

Established by the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, the Small Community Air Service Development Program is a grant program designed to assist small communities in addressing air service deficiencies. According to the USDOT's description of the program, it differs from the EAS program in that it has broader eligibility and offers financial assistance for marketing programs, start-up costs, and studies. It can also involve revenue guarantees. Only public entities are eligible to apply for the program, with grant amounts ranging from $20,000 to $1.6 million in past years.[32]

In the program's most recent round (2022), there were no awards made to any of Pennsylvania's airports; however, there have been a few awards in recent years, including:

[32] https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/SCASDP

- 2018 – Erie International Airport was awarded $292,000 to cover ground handling and marketing expenses to reduce air carrier operating expenses for new, non-stop service to Washington-Dulles.
- 2019 – Williamsport Regional Airport was awarded $950,000 used as a revenue guarantee for new regional jet service to Washington, D.C., and Chicago.

Other airports in Pennsylvania that have secured grant funds in the past decade include Harrisburg International Airport, Arnold Palmer Regional Airport (Latrobe), and Wilkes-Barre Scranton International Airport.

Access to Essential Services

Air service is critical to ensuring rural communities have access to the national network as well as to life-sustaining services. Airport stakeholders noted that many smaller, more rural communities have diminished access to healthcare resources. Aviation, particularly general aviation, helps strengthen that linkage. Not only can aviation get time-sensitive medical supplies to rural communities quickly, but aviation is critical in getting patients in rural areas to emergency and/or specialized care facilities quickly. While EAS and other programs have helped sustain service at these smaller, more rural airports, airport stakeholders noted that other resources and support mechanisms are needed to ensure their needs are heard and addressed. Pennsylvania does not currently have a campaign to market the state's rural regions for new or continued air service, including marketing Pennsylvania's airports for commuting. Should there be fewer airports providing commercial air service in the future, Pennsylvania may need to consider improved ground access to the remaining commercial service airports (e.g., express bus service).

Air service is critical to ensuring rural communities have access to the national network as well as to life-sustaining services.

COVID-19 Impacts, Challenges, and Recovery

According to a report by the National Academies of Science, Engineering, and Medicine, the U.S. airline industry lost $370 billion globally in 2020—a staggering

loss for an industry that averages $800 billion annually. In addition, airports in other countries lost an estimated total of $115 billion.

Historically, business travel has been more profitable for airlines than leisure travel. An article from Investopedia notes that while "business travelers comprise 12 percent of airline passengers, they pay higher rates that are more lucrative, accounting for as much as 75 percent of airline profits."[33] In Pennsylvania and beyond, the long-term impact of COVID-19 and remote work on business travel by air is still uncertain. Trips will likely depend on business purpose and working/meeting remotely may influence how businesses allocate their budgets moving into the future. The report *Aviation after a Year of Pandemic*, by the National Academies, predicted that domestic air travel in the United States would likely return to pre-pandemic levels by 2022 after stay-at-home orders and other restrictions were lifted.

Regional carriers are one of many types of airlines adapting to these uncertainties. Business travel has yet to return to pre-COVID levels; however, leisure travel has since rebounded. Due to the uncertainty of the return of business travel, some carriers are shifting their focus toward transporting leisure travelers from rural Pennsylvania to larger hubs.

Business travel has yet to return to pre-COVID levels; however, leisure travel has rebounded.

Investment in Marketing and Retaining Service

Pennsylvania's commercial service airports receive varied levels of local investment in attracting, retaining, and promoting commercial air service. Aviation stakeholders expressed the desire for Commonwealth assistance in negotiating with and attracting commercial airlines to the state's airports. The involvement of state agencies such as PennDOT and DCED in airline negotiations and marketing allows for a unified system-wide voice, rather than each airport lobbying for its own needs.

[33] https://www.investopedia.com/ask/answers/041315/how-much-revenue-airline-industry-comes-business-travelers-compared-leisure-travelers.asp

Strategic Actions – Commercial Air Service

1. **Develop "Fly Local" programs/marketing campaigns throughout Pennsylvania.**
    a. Offer reimbursements for flying local.
    b. Establish a Rural Air Service marketing campaign for communities that are not connected to the national system.
2. **Catalog and share airport flight schedules.**
3. **Include the Commonwealth and local government elected officials in the Essential Air Service (EAS) bidding process to strengthen EAS statewide.**
4. **Ensure the participation of state agencies, community leaders, and legislators in the pursuit of Small Community Air Service Development Program funding.**
5. **Develop a Rural Aviation Subcommittee or Task Force of the Aviation Advisory Committee to provide a voice for airports that serve rural regions.**
6. **Coordinate with and support airports in attracting and retaining commercial air service.**
7. **Incorporate considerations of alternative fuels into future funding and marketing strategies as airlines begin to shift toward alternatively fueled aircraft.**
8. **Conduct a statewide passenger leakage analysis to identify areas/regions/airports that may need additional marketing/retention assistance.**
9. **Prioritize the remaining commercial service airports in the Commonwealth in terms of their long-term essentiality and viability and other factors, and prioritize investment accordingly.**

Technology

Issue in Brief

Many emerging technologies related to transportation continue to require states, regions, and localities to be adaptive to their potential future impacts. These include those coming online for aviation such as unmanned aircraft systems, advanced air mobility, alternative fuels, and other technological innovations. In order for Pennsylvania to take full advantage of the benefits (economic and otherwise) of these technological advances, the state must be proactive and prepared to address the policy and operational challenges that may come with them.

Situation Analysis

Unmanned Aircraft Systems (UAS)

UAS, or drones, continue to evolve as part of the aviation system and continue to have a growing range of uses—from recreational use to commercial and military use. In some cases, they have become vital to the operations of various businesses and organizations. According to the FAA, more than 850,000 drones are registered within the United States, with 273,000 certified pilots.[34] Of these drones, more than 60 percent are registered for recreational use, with the remaining being commercially registered or registered on paper. According to an article by Business Insider, commercial drone uses are gaining momentum and include:[35]

- Aerial photography
- Express shipping and delivery

In order for Pennsylvania to take full advantage of the benefits of technological advances in aviation, the state must be proactive and prepared to address the policy and operational challenges that may come with them.

[34] https://www.faa.gov/uas/resources
[35] https://www.businessinsider.com/drone-technology-uses-applications

- Disaster management
- Search and rescue operations (thermal sensors)
- Geographic mapping
- Safety inspections
- Unmanned cargo transport
- Law enforcement and surveillance
- Storm and weather tracking

Pennsylvania enacted a drone law in the interest of public safety (Act 72 of 2018). The legislation makes it illegal to operate a drone to conduct surveillance of another person in a private place in a way that places another person in fear of bodily injury, and/or to transport contraband.[36] Additionally, the FAA offers resources to certified UAS pilots including the B4UFly app, which keeps pilots apprised of any restrictions in the areas they plan to fly their aircraft.

As part of FHWA's "Every Day Counts" program and with financial assistance from the State Transportation Innovation Council, PennDOT established a UAS program in 2018 with 13 licensed UAS pilots and aircraft. Currently (2022), PennDOT has a minimum of 27 PennDOT-certified UAS pilots and 22 drone aircraft. In addition to these registered pilots, PennDOT has also leveraged the assistance of 88 consultant/ contractor pilots. The drones are used in construction and asset management applications such as structural and construction inspection, traffic analyses, incident management, and disaster response. Additionally, PennDOT established a UAS Task Force in June 2021 at the direction of Pennsylvania Governor Tom Wolf with the vision

[36] https://www.penndot.pa.gov/Doing-Business/Aviation/Licensing%20and%20Safety/Pages/Unmanned-Aircraft-Systems-(Drone)-Information.aspx

of “safe and strategic integration of UAS into the state’s transportation system.” Other opportunities within Pennsylvania for UAS include House Bill 1675 of 2021, which is currently moving through the Pennsylvania Legislature. If passed, the bill would amend Title 74 (Transportation) to establish the Unmanned Aircraft Innovation Program and Unmanned Aircraft Innovation Fund, which would provide grant funding to support the UAS industry.

Cargo/Delivery Uses

Cargo drones vary in capacity and range of delivery services, from last-mile deliveries with small payloads to large capacities greater than 5,000 pounds like the Rhaegal.[37] Some of the potential advantages of cargo drones include the use of minimal airspace, potential reduction in delivery vehicle traffic on the highway system, and being electric-powered. FedEx and Elroy Air announced that FedEx Express will begin testing hybrid VTOL aircraft (Elroy’s Chaparral) to move cargo in 2023 at a range of 300 to 500 miles.[38] During this study’s regional listening sessions, Pennsylvania’s aviation stakeholders noted that they expected air freight would be one of the first aviation sectors to shift to large drone operation in the future.

Pennsylvania’s Readiness for Drone Implementation

Researchers from Mercatus Research Center at George Mason University developed a scorecard to gauge each US state’s readiness for implementation of drones, based on five factors. These are the presence of airspace lease and avigation easement laws (which carry the most weight), presence of air rights laws, a drone task force or program office, and an estimate of drone jobs in the state.[39] Based on these criteria,

State Drone Industry Readiness Rankings

#1: North Dakota
#2: Arkansas
#3: Oklahoma
#4: Nevada
#5: Virginia
#6: Georgia
#7: North Carolina
#8: New Jersey
#9: Delaware
#10: Texas
. . .
#34: Pennsylvania

[37] https://www.aeroclass.org/cargo-drones/
[38] https://www.forbes.com/sites/edgarsten/2022/03/30/fedex-to-demo-elroy-air-autonomous-drones/
[39] https://www.mercatus.org/system/files/skorup_which_states_are_prepared_for_the_drone_industry_rp_mercatus_v1_0.pdf

Pennsylvania ranks 34th in the nation, below surrounding and nearby states including New Jersey, Delaware, Maryland, Virginia, and Ohio. In order to fully take advantage of the economic benefits of the UAS industry, Pennsylvania will need to adapt and evolve to match the readiness level of its neighbors.

Advanced Air Mobility (AAM)

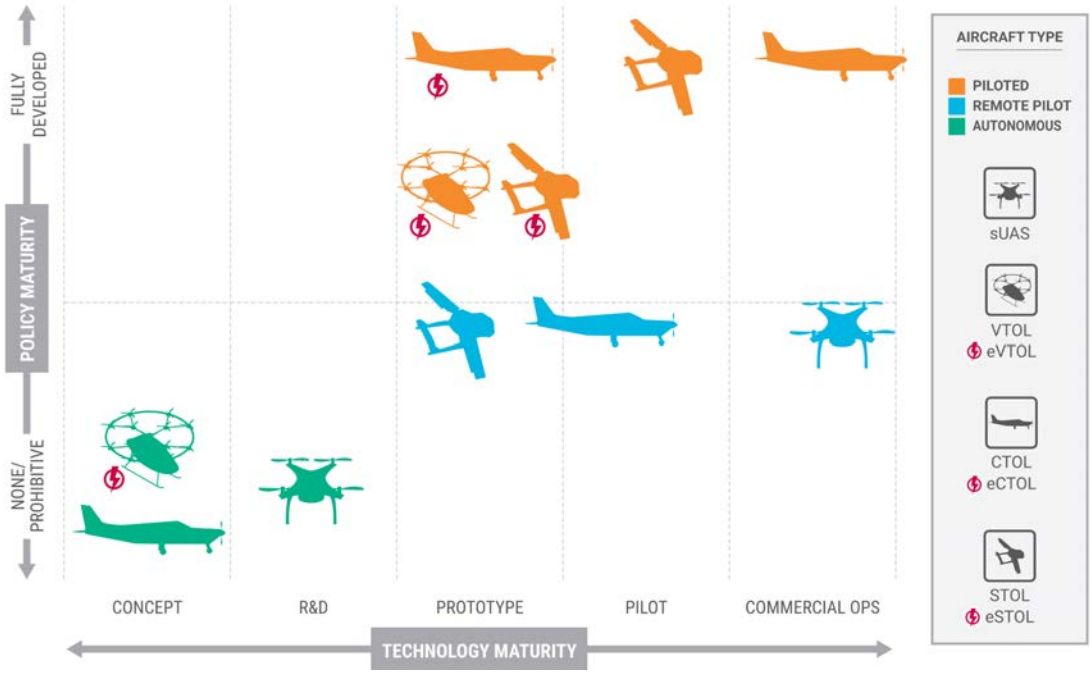
The FAA defines advanced air mobility, which includes urban air mobility (UAM), as a "safe and efficient aviation transportation system that will use highly automated aircraft that will operate and transport passengers and cargo at lower altitudes within urban and suburban areas."[40] Within these networks, passengers and cargo would be transported via Vertical Takeoff and Landing (VTOL) vehicles to landing facilities known as vertiports. These aircraft are usually electric-powered and are currently in various stages of development. FAA released Vertiport Design Standards on September 26, 2022.[41]

As is the entirety of the AAM field, aircraft to be used by this industry are still being heavily researched and are in various stages of development in both technology and policy as shown in Figure 33, developed by the Ohio Department of Transportation.

NASA is exploring ways in which vertiports can be retrofitted into existing infrastructure and facilities, and where new landing areas are best suited.[42] In addition to infrastructure, the agency is keeping safety and sound community integration at the forefront. In Pennsylvania, the Senate Aviation Caucus is considering the potential future impacts of vertiports and VTOLs, noting that VTOL aircraft may begin with

[40] https://www.faa.gov/uas/advanced_operations/urban_air_mobility
[41] https://www.faa.gov/uas/advanced_operations/urban_air_mobility
[42] http://www.nasa.gov/centers/armstrong/features/aam-plans-for-vertiports.html

Figure 33: Technology and Policy Maturity by Aircraft Type



Source: Ohio Department of Transportation: Ohio AAM Framework

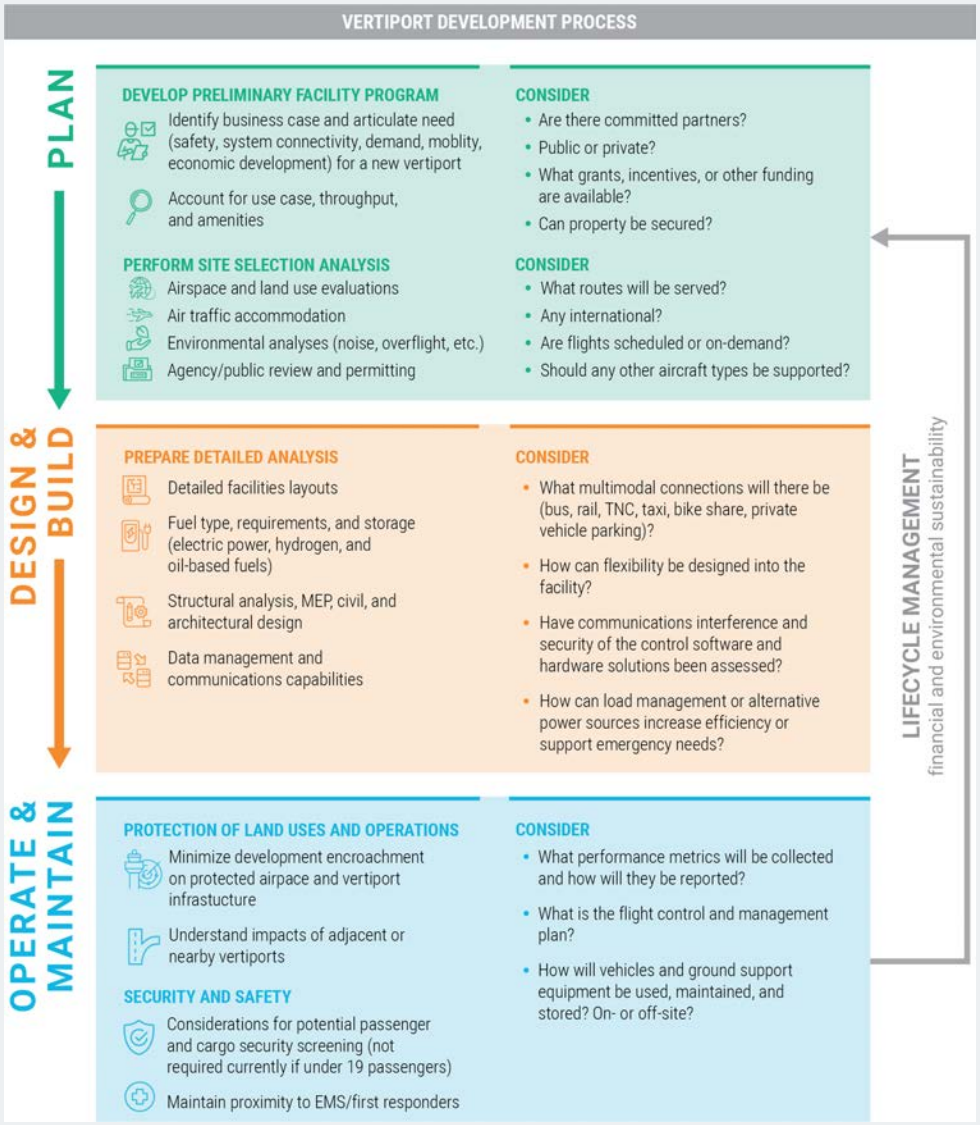
pilots on board and shift to autonomous operations in the future, and can be used in locations such as the top deck of parking garages.

How Neighboring States are Planning for Aviation Innovation

In Summer 2022, the Ohio Department of Transportation (ODOT) released its Advanced Air Mobility Framework report, outlining critical components and considerations for the state to position itself as an AAM leader. The state examined various business use cases (e.g., air taxis, regional air mobility, airport shuttles, emergency services, corporate aviation, freight delivery) for AAM through research, data analysis, and an extensive outreach effort. The resulting framework follows a four-step structure and includes considerations for the key players, as shown in Figure 34.

ODOT recognizes this is an effort that the state cannot tackle alone, and the framework emphasizes the importance of partnership and collaboration in the implementation of AAM infrastructure,

Figure 34: Ohio DOT Advanced Air Mobility Framework



necessary technology, and related policy initiatives. It includes recommendations for its partners at the regional and local levels as well as for those working in the industry.

As neighboring states continue these planning and policy initiatives and advancements, Pennsylvania will need to leverage existing and new resources to keep pace. By working to advance policy initiatives that position the state for the implementation of AAM, Pennsylvania may be able to take full advantage of the economic benefit (e.g., monetary, workforce) that the industry can provide. A statewide framework, similar to that completed in Ohio, would be beneficial to guide this work.

UAS and Advanced Air Mobility Preemption

As these new technologies continue to evolve, agencies at all levels, nationwide and in Pennsylvania, are considering their respective roles in the use of drones and the management of airspace. Without policy guidance and a clear framework, the state's airports are experiencing challenges in planning and preparing for new and existing UAS and AAM activities.

As such, UAS and AAM Preemption is on the radar of the Pennsylvania State Aviation Caucus. In a 2022 presentation, member John Walker noted that preemption in localities may lead to issues and questions regarding what entity is responsible for the airspace. While localities may want to be involved, airspace responsibility is currently with the FAA, and federal regulations hold precedent over state and local laws regarding airspace. The intent is to avoid "fractionalized control of the navigable airspace."[43]

[43] https://dronelife.com/2018/07/24/faa-stance-on-state-drone-regulation-preemption-is-still-preemption/

Alternative Fuels

Many vehicles, both ground and air, are being researched to explore new ways to incorporate alternative fuel sources for power and energy as a way to reduce emissions and other climate change impacts.

- **Aircraft Electrification:** According to a National Renewable Energy Laboratory (NREL) report on aircraft electrification, test flights are already underway using retrofits of existing aircraft with a focus on near-term deployment; however, large all-electric aircraft will likely not be viable until mid to late century. The report also references a market analysis that states electrification of aircraft depends on a series of factors, including:[44]
  - » **Reduced costs:** Long-term operational cost savings (fuel and maintenance) are identified as a leading factor for aircraft operators to electrify aircraft.
  - » **Regional travel market:** Limited battery capacity in electric hybrid aircraft translates to a limited range; however, they may present an opportunity for providing regional service at smaller, regional airports. The report also highlights that 90 percent of the U.S. population is within a 30-minute drive of a regional airport compared to only 60 percent being near a large commercial hub.
  - » **Emissions and noise reductions:** The NREL report notes that regional, short-haul trips are less efficient than long-haul flights in terms of emissions.[45] Additionally, a study by United Technologies Corporation shows that hybrid-electric and electric propulsion methods may lead to reductions in noise and

[44] https://www.osti.gov/servlets/purl/1827628/
[45] https://www.osti.gov/servlets/purl/1827628/

improvements in fuel economy, and may reduce emissions and operating/ maintenance costs by 20 percent.

- **Hydrogen-Powered Aircraft:** Hydrogen-powered planes are equipped with hydrogen fuel cells, or hydrogen-powered jet engines, or a hybrid of hydrogen turbines and fuel cells. Airbus notes that hydrogen technologies in aircraft have an energy-per-unit mass that is three times higher than jet fuel and is generated through renewable energy. Hydrogen-powered aircraft are being researched by several aviation companies. An example is the partnership between Delta and Airbus to create a hydrogen-powered plane while also researching potential for fuel supply and storage at airports.[46] According to the National Academies of Science, Engineering, and Medicine report, *Aviation After a Year of Pandemic*, technical challenges related to hydrogen power in aviation will likely lead to a decades-long delay in its implementation despite its advantages.

[46] https://www.canarymedia.com/articles/air-travel/major-airlines-are-getting-serious-about-hydrogen-powered-planes

Strategic Actions – Technology

1. **Plan and prepare for developing the infrastructure needed to deploy alternative fuels such as hybrid-electric and electric-powered aircraft.**
2. **Partner with the Pennsylvania Public Utilities Commission (PUC) and local utilities to develop the electric power capacity to construct charging facilities at airports.**
3. **Monitor developments related to hydrogen-powered aircraft.**
4. **Prepare for Urban Air Mobility and plan for vertical takeoff and landing (VTOL) aircraft.**
    a. Define a statewide protocol for developing vertiports and set aside land to accommodate them.
    b. Involve larger urbanized MPOs in conceptual planning.
5. **Establish or gain licensing for a UAS information and data exchange program to foster public- and private-sector collaboration on research, testing, and deployment.**
6. **Develop policy guidance to assist Pennsylvania's airports in preparing for new and existing commercial/ private-use UAS activity.**
7. **Provide an appropriate level of staffing within PennDOT's Bureau of Aviation for a UAS/Advanced Air Mobility (AAM) manager to facilitate coordination of statewide drone/VTOL initiatives. At a broad level, this growing area of responsibility includes planning, policy development, public safety, and data management.**
8. **Establish a Pennsylvania interagency group (at a minimum including PennDOT, PA Department of Environmental Protection (DEP), PA Department of General Services (DGS), Pennsylvania State Police (PSP), Pennsylvania Turnpike Commission (PTC), and PA Emergency Management Agency (PEMA)) to evaluate existing agency-specific drone programs and uses.**
    a. Explore the value, need, and feasibility of a centralized statewide UAS and AAM program.
9. **Develop a framework for the safe, efficient use of drones and other unmanned aircraft technologies in Pennsylvania.**

Industry Collaboration and Partnerships

Issue In Brief

A wide range of partners and partnerships exist and are possible for PA aviation. At the airport level, an airport manager and the airport board or authority typically engage various partners. Leveraging aviation industry collaboration and partnerships will yield better outcomes at Pennsylvania airports and improved economic outcomes across the Commonwealth.

Situation Analysis

Many partnerships are required for each Pennsylvania airport to effectively sustain and expand operations into the future. Likewise, many partnerships are necessary for Pennsylvania's aviation industry to grow into the future.

Airport Collaboration and Partnerships

Historically, the level of collaboration between Pennsylvania's airports and a wide range of partners has depended upon several factors.

- Size and Location – Is an airport large or small? Is it located in a larger urban or suburban area with more surrounding activity or a rural setting with less surrounding activity?
- Capacity – Does the airport have staff and board capacity to connect with available partners?
- Partners – Do the partners recognize the airport as an asset? Do airports know the range of potential partners and how each might be an asset?
- Communication – Do the airports and potential partners actively communicate the goals that each brings to the table? Do each understand capacity limitations and the need to explore other partnerships and strategic alliances?

Lehigh Valley Collaboration

The Lehigh Valley is an example of a Pennsylvania region with well-established partnerships resulting in good collaboration. Lehigh Valley aviation collaboration goes back to the early 1960s, when an airport representative was added to the MPO board (a Lehigh-Northampton Airport Authority (LNAA) representative has a seat on the Lehigh Valley Transportation Study (LVTS) board). Having an LNNA representative on the MPO board builds trust and a shared understanding of needs over time, helping to develop mutually beneficial projects and initiatives. The long-term transportation partnerships through the MPO enabled the region to develop an Airport Area Freight Study and the recent Eastern Pennsylvania Freight Infrastructure Plan Partnership.

Diverse board membership is also beneficial in achieving a well-rounded aviation master plan. As an example, when LNAA completed the 2019 Master Plan for Lehigh Valley International Airport it included a regional context specifying not only plans for the continued operational success of the airport complex and the services it provides, but how it connects to passenger and freight markets in the metropolitan area and in the northeastern United States. LNAA's diverse board membership was beneficial in developing a robust strategic plan and master plan.

The cohesiveness between Lehigh Valley planning documents is intentional and beneficial. LVPC and LVTS were represented on the steering committee for the LVIA Airport Master Plan and the Lehigh Valley's comprehensive plan, *FUTURELV: The Regional Plan*. As a result, the airport master plan and comprehensive plan are consistent with each other. The partnership-building in the Lehigh Valley has led to increased collaboration between Lehigh Valley airports, Pennsylvania's aviation system, and transportation and economic development efforts.

Aviation Industry Collaboration and Partnerships

Compared to the community-level partnerships established between airports and their network on the ground, the aviation industry acts from a big-picture or 30,000-foot view to facilitate successful transactions for Pennsylvania airports. The factors that influence aviation industry partnerships are summarized below.

- Awareness – Aviation industry partners need to understand the benefits that non-aviation industry partners bring to the table. Non-aviation industry partners need to understand why and how the aviation industry operates and how the industry influences airports.
- Capacity – Both aviation-industry and non-aviation-industry partners need to recognize the staff capacity issues that each organization faces. Carrying out what is in the best interest for Pennsylvania aviation may not necessarily line up with organizational capacity for non-aviation partners.
- Competing Interests – Non-aviation partners have multiple interests. These include other transportation modes such as roads, bridges, ports, public transportation, passenger rail, rail freight, pedestrian, and bicycle accommodation, as well as other industries with workforce needs, such as the construction trades and cybersecurity. Clear expectations need to be agreed upon regarding the level of non-aviation industry involvement in addressing aviation issues.

Who are the Partners?

A list of potential partners—both airport partners and aviation industry partners—was compiled as part of this TAC study. Figure 35 provides an expansive list of partners that, if effectively informed and engaged, can promote aviation throughout and beyond Pennsylvania.

Westmoreland County Collaboration

Although the Westmoreland County Airport Authority staff is small, it works proactively with the community to improve collaboration and attract new investment to the airport and surrounding areas.

- The airport works with the community to promote community functions and events. Its annual air show attracts more than 100,000 spectators, with the airport being a longstanding member of the International Council of Air Shows. The estimated economic impact of the air show on the community is between $3 million and $5 million. The authority finds ways to support high school students interested in the aviation industry by partnering with local high schools and non-profits to augment scholarships through the Pittsburgh Institute of Aeronautics Scholarship Program.
- The results of the authority's efforts to attract new investment and generate additional revenue are evident in its economic impact.
  - In 2010 the Arnold Palmer Regional Airport had an estimated impact of $94 million and employed 17 people.
  - In 2020, 10 years after the airport authority worked with Spirit Airlines to establish commercial service at the airport, its estimated economic impact was $226 million and it provided 70 airline jobs and 25 airport jobs.

Figure 35: Potential PA Aviation Partners

Partners for Airports	Partners for the Aviation Industry	
• PennDOT - BOA • FAA • PA Airports and Authorities • State and Federal Aviation Associations • Municipalities • Citizens Groups • School Districts • Private Businesses • County Commissioners • County Planners • Local/County Economic Development Organizations • Local/County Chambers of Commerce • DCED • MPOs/RPOs • Local Development Districts (LDDs)/Regional Planning Organizations • PA Higher Education Partners • Aviation Workforce Development Partners	• FAA • National Aeronautics and Space Administration (NASA) • Transportation Security Administration (TSA) • PA Airports and Authorities • PennDOT - BOA • PA Transportation Advisory Committee (TAC) • PA Aviation Advisory Committee (AAC) • PA State Transportation Commission (STC) • PA Senate Aviation Caucus • PA State Legislature • State and National Aviation Associations » PA Aviation Council of PA (ACP) » PA Drone Association » Aircraft Owners & Pilots Association (AOPA) » National Association of State Aviation Officials (NASAO) » National Business Aviation Association (NBAA) » Cargo Airlines Association » Airports Council International » Airlines for America » Regional Airlines Association » Airline Pilot Club (APC) » American Association of Airport Executives (AAAE)	• PA DCED • PA Department of Education • PA Department of Labor & Industry • PA Department of Revenue • PA Higher Education Partners • Aviation Workforce Development Partners • MPOs/RPOs • LDDs/Regional Planning Organizations • PA Municipal Associations » County Commissioners Association of PA (CCAP) » PA State Association of Township Supervisors (PSATS) » PA State Association of Boroughs (PSAB) » The Pennsylvania Municipal League (PML) » Pennsylvania State Association of Township Commissioners (PSATC) • American Planning Association - Pennsylvania Chapter • Pennsylvania Economic Development Association • Team Pennsylvania • American Council of Engineering Consultants (ACEC)

Strategic Actions – Industry Collaboration and Partnerships

1. **Improve coordination among airports and Metropolitan Planning Organizations/Rural Planning Organizations (MPOs/RPOs; Planning Partners), Local Development Districts, and other economic development/regional organizations.**

    a. Promote state policy to require or encourage aviation representation as a voting member of MPO/RPO boards, and vice versa on airport boards.

    b. Incorporate aviation topics as part of PennDOT Planning Partners' discussions.

2. **Improve statewide aviation industry partnership and collaboration.**

    a. Develop regular aviation policy and technology briefings to share with partners and various marketing audiences (passengers, businesses).

    b. Formalize interagency protocol among PennDOT, DCED, and other key state agencies.

    c. Encourage Pennsylvania airports to work closely with both county and regional economic development organizations and county and regional planning organizations.

    d. Establish a guide or equivalent resource that identifies the kinds of partnerships and strategic alliances that can be considered with the wide range of organizations listed in Figure 35. Provide training or familiarization sessions with airports and others to promote the use of the partnering guide.

3. **Enhance services to improve an airport's ability to develop effective partnerships, especially rural airports.**

    a. Develop an AirTAP to provide technical assistance for all Pennsylvania airports.

Legislation and Policy

Issue In Brief

The ability to maximize aviation opportunities through forward-thinking policy and effective legislation will help to sustain the Commonwealth's aviation system and cultivate economic development opportunity, including opportunity afforded by new and emerging aviation technology. The General Assembly has demonstrated strong aviation support through the passage of the Airport Land Development Zone (ALDZ) Program.

Situation Analysis

At the federal level, the National Association of State Aviation Officials (NASAO) developed the following priorities for its 2022 legislative agenda.

- Provide Robust Aviation Funding – Increase Airport Improvement Program (AIP) investment by $250 million to $3.6 billion in FY 2023 and incrementally increase that amount to $4 billion over the course of five years.
- Continue Support of COVID-19 Recovery – Increase the federal share of AIP funds to 95 percent for FY 2023, apportioning FY 2023-2026 AIP funding based on calendar year 2019, 2020, or 2021 passenger enplanements, whichever is highest.
- Modernize the Non-Primary Entitlement (NPE) – Reform the NPE program to better meet the needs and realities of non-primary airports.
- Ensure Air Service to Small Communities – Fully fund the Essential Air Service (EAS) Program, Small Community Air Service Program (SCASP), Federal Contract Tower (FCT) Program, and Military Airport Program (MAP).
- Prepare for New Era of Aviation – Work with FAA and aviation organizations to focus on drone integration strategies; national standards to address Advanced Air Mobility (AAM) airspace coordination and control; infrastructure planning

courtesy of Larry Nulton

requirements to accommodate AAM, such as electrical requirements, charging standards, and vertiport design criteria; FAA plans and polices for funding to support AAM; and a sustainable aviation fuel (SAF) blenders tax credit to incentivize the production and distribution of SAF.

- Provide Federal Support for Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Cleanup Efforts at Airports – Implement federally assisted clean-up programs for PFAS contamination at airports stemming from FAA-required use of firefighting foams containing PFAS.
- Enhance State Block Grant Program Implementation – Strengthen SBGP program and policy implementation and encourage FAA to increase collaboration with the Block Grant States (BGS) in addressing current and future program needs.

In addition, proposed federal legislation introduced in July 2022 would raise the mandatory retirement age for pilots from 65 to 67.

In Pennsylvania, aviation legislative priorities are advanced by the Senate Aviation Caucus in conjunction with the Aviation Advisory Committee (AAC) and the Aviation Council of Pennsylvania (ACP). The partnerships have resulted in the passage of legislation, including the Airport Land Development Zone (ALDZ) program, which passed in July 2022 with strong advocacy by ACP.

Current aviation legislative proposals are summarized Figure 36.

Figure 36: Pennsylvania Aviation Legislation Proposals[47]

Topic	Description	Bill/Sponsor	Last Action
Aviation Fuel Tax	Amends Title 74 (Transportation) setting the Jet Fuels Tax at a flat rate of 2.0 cents per gallon and Avgas at a flat rate of 6.0 cents per gallon with no annual adjustment.	House Bill 2455 of 2022 / Representative Carroll	Referred to Transportation 03/24/22
Aviation Restricted Account	Amends Title 74 and transfers the Aviation Restricted Account from State Treasury and into the Motor License Fund.	House Bill 2126 of 2021 / Representative Schroeder	Referred to Transportation 02/14/22
Peer-to-Peer Car-Sharing	Amends Titles 40 (Insurance) and 74 to include special provisions relating to peer-to-peer car-sharing.	House Bill 2098 of 2021 / Representative Nelson	Referred to Insurance 11/23/21
Airport Licensing	Modifies airport licensing to revise distance of 2 miles between airports. Removes the requirement that a new airport cannot be located within 2 miles of an existing airport.	House Bill 1785 / Representative Benninghoff	Referred to Transportation 01/12/22
Unmanned Aircraft	Amends Title 74 in aviation development, establishing the Unmanned Aircraft Innovation Program and the Unmanned Aircraft Innovation Fund, providing grant funding to support the unmanned aircraft industry.	House Bill 1675 of 2021 / Representative Schroeder	Referred to Transportation 06/23/21

[47] The legislative session ended on November 30, 2022. Presumably these and other proposals will be introduced in the next session starting in January 2023.

Policy leadership is critical to ensuring Pennsylvania's aviation industry remains viable and competitive into the future. Private-sector innovation and change is accelerating, posing a positive challenge for policy-making to position for these changes, as applicable.

Pennsylvania currently lacks a statewide policy and funding strategy to position the state as a UAS industry leader. As described in the Technology section, according to a drone industry report card ranking states on legislation and drone industry data, prepared by the Mercatus Center of George Mason University, Pennsylvania ranks 34th for drone readiness; Virginia, New Jersey, and Delaware rank 5th, 8th, and 9th, respectively.[48]

Evaluating public policy impacts and benefits over time (e.g., the Fixed Wing Maintenance, Repair, and Overhaul sales tax exemption, and loss of essential air service subsidies) will be useful in considering future legislative and policy priorities.

The needs and funding analysis conducted for this assessment (see Part 1) includes several new or expanded revenue sources to help address Pennsylvania's current and future aviation funding gap. Additional resources will require concerted legislative action.

Policy leadership is critical to ensuring Pennsylvania's aviation industry remains viable and competitive into the future.

[48] Mercatus Center at George Mason University, "Which States Are Prepared for the Drone Industry? A 50-State Report Card 2.0." January 14, 2021. Accessed 8/8/22 at: https://www.mercatus.org/publications/technology-and-innovation/which-states-are-prepared-drone-industry-0.

Strategic Actions – Legislation and Policy

1. **Facilitate passage of legislation and accompanying policies required to implement the funding strategies outlined in Part 1 of this report.**

    a. Impose a new annual Aircraft Registration Fee averaging approximately $300 per aircraft.

    b. Increase the Jet Fuel Tax from 2 cents per gallon to 4 cents per gallon.

    c. Increase the Avgas Tax from 6 cents per gallon to 12 cents per gallon.

    d. Redirect the 6 percent Aircraft Sales Tax from the General Fund to aviation.

    e. Redirect 0.02 percent of the 6 percent State Sales Tax from the General Fund to aviation.

    f. Direct 5 percent of revenue generated from a new Package Delivery Fee to aviation.

2. **On an ongoing basis, consider and as needed advance the passage of aviation-focused land use legislation in conjunction with the Aviation Council of PA.**

    a. Meet regularly with the Senate Aviation Caucus and the House and Senate Transportation Committees.

    b. Obtain input from county planning directors, regional planning organizations, and the economic development community through the Pennsylvania Economic Development Association (PEDA).

    c. Meet with the State Planning Board to advance land use changes required for aviation industry safety and growth.

3. **Advance legislation and corresponding policy to further develop Pennsylvania's UAS and AAM industry.**

4. **Support legislative efforts to raise the federal pilot retirement age from 65 to 67.**

5. **Monitor the outcomes of aviation programs and funding to identify future legislative and policy improvements.**

    a. Assess the effectiveness and impacts for programs and funding sources such as, but not limited to, the MRO sales tax exemption, loss of Essential Air Service subsidies, and future impacts of the ALDZ program.

Johnstown - Cambria County Airport
courtesy of Larry Nulton

Next Steps

Call to Action

Aviation made a major contribution to the nation and the Commonwealth throughout the 20th century—changing transportation in revolutionary ways. During those first 100 years of aviation Pennsylvania invested in developing airports to strengthen its communities and to bolster a competitive economy. Pennsylvania also created a state Aeronautics Commission and later the PennDOT Bureau of Aviation, funded state airport improvement programs, and licensed airports to help ensure safety.

Pennsylvania needs a comprehensive strategy for the 21st century that includes both expanded investment and the advancement of strategic initiatives. The timing appears opportune, coinciding with a new legislative session and a new Commonwealth administration. Expanded federal investment through the Bipartisan Infrastructure Law ushered in a new era of infrastructure investment and renewal. A serious dialogue regarding state investment has occurred through TROC and PennDOT Pathways and will likely continue in the next session of the General Assembly.

Through this study, TAC believes that it has carried out its advisory role to transportation decisionmakers in both the executive and legislative branches of state government. TAC calls on the Secretary of Transportation and the Transportation leaders in the PA House and Senate to use this report as the basis for a strategic reinvestment and refocus for Pennsylvania aviation. Pennsylvania's continued aviation legacy may hinge on doing so.

courtesy of Philadelphia International Airport

From Recommendations to Strategic Action

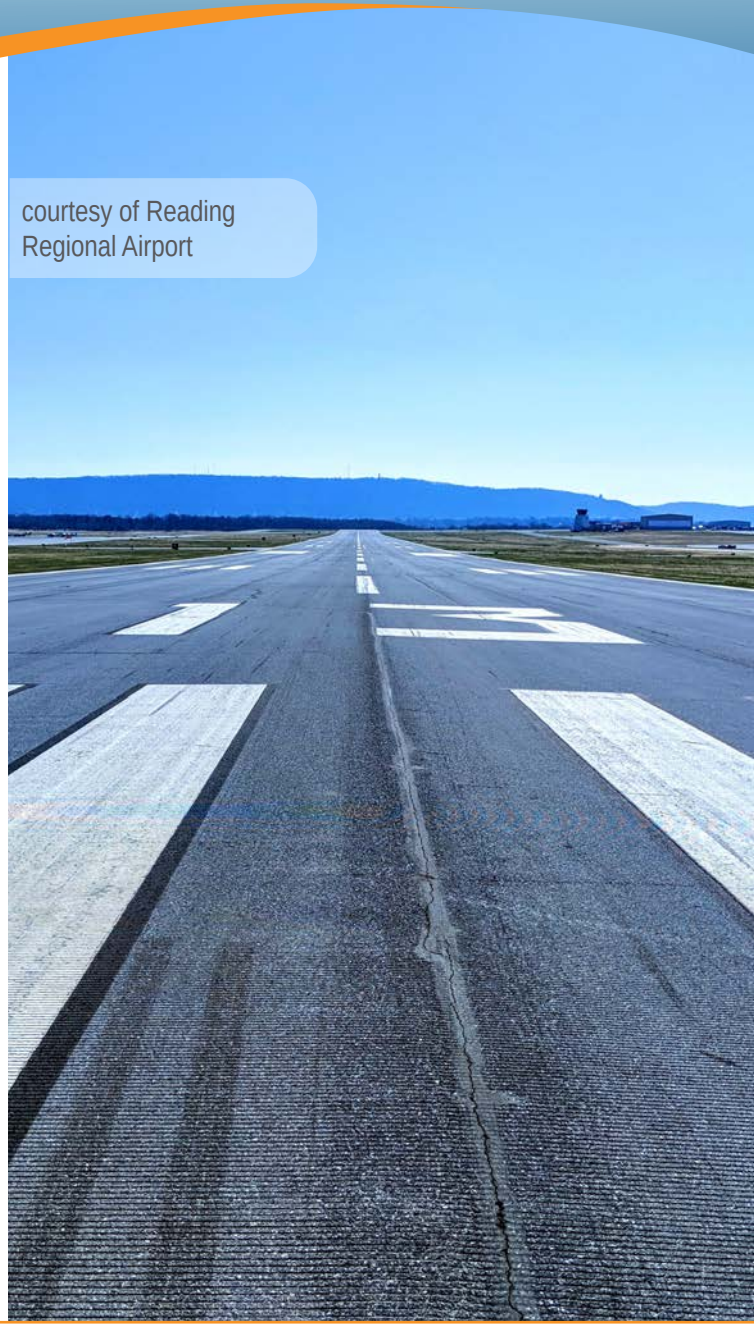
Implementation Challenge

The Transportation Advisory Committee is not an implementing body. Its involvement ends with the adoption of this important report, though TAC looks forward to receiving periodic status updates on the implementation of its recommendations.

TAC's statutory mission is to advise policymakers—the Secretary of Transportation and the State Transportation Commission (which includes transportation legislative leadership). As such, it is constructive to recognize that the connection between studies/plans and implementation can be challenging. For this important and timely study to achieve its impact there must be a systematic advance of its implementation.

TAC's recommended strategies are, in part, the product of statewide stakeholder listening sessions and considerable review and vetting of aviation system needs, funding options, and a wide range of issues and opportunities. Further, TAC scanned the efforts of other states in making this assessment. TAC intentionally did not take the strategies as far as identifying the "who, what, where, and how" details that will be the necessary work of the many implementers in state government and beyond.

A structured, organized, and accountable follow-up is essential for both the funding and strategy elements of the report so that the recommended expansion of investment for aviation can indeed be built on a comprehensive strategic foundation. This report should be used by a broad group of implementing partners, convened by PennDOT to establish actionable direction.



courtesy of Reading Regional Airport

Recommended Implementation Approach

TAC's recommended comprehensive investment strategy for aviation in the Commonwealth, at minimum, is an important foundation on which the various implementing organizations can build to ensure the funding and strategic elements are properly addressed. To move from this study to effective implementation, TAC recommends the following steps under the coordinated leadership of the Multimodal Deputate and the Bureau of Aviation with periodic progress reporting to the Secretary of Transportation:

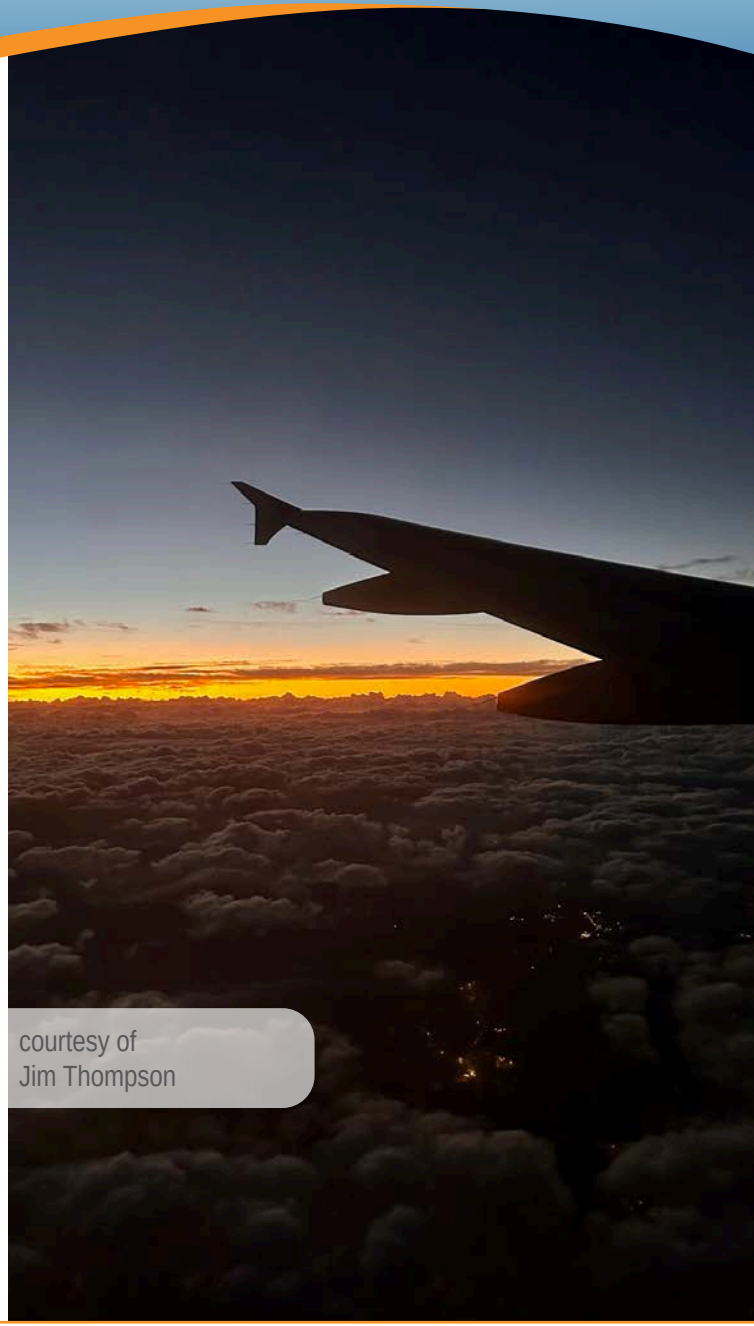
1. Prepare for implementation start-up in the first half of 2023, resulting in a broad-based implementing group and a strategic action plan (see steps 3 and 4 below, respectively).
2. Review the overall direction of this report with leadership in the General Assembly, including the Senate Aviation Caucus and the Transportation committees of the House and Senate, and the executive branch of state government.
3. Establish a framework for a partnership approach to implementation with the Aviation Advisory Committee, the Aviation Council of Pennsylvania, other state agencies, the Senate Aviation Caucus, the FAA Airport District Office (ADO), and others (participating members of the implementation group, however constituted, should make a 24-month commitment to staying actively involved to move the aviation direction forward).
4. Develop an action plan to address the eight strategic areas in this report and for advancing the funding recommendation. The action plan should:
    a. Identify responsible and accountable lead and support organizations.
    b. Identify additional action steps as needed for each strategy.
        i. Establish sequenced timelines for actions over a 3- to 5-year period.
        ii. Provide status updates on a regular basis to report on progress toward completion.
5. Involve other PennDOT representation such as Fiscal, Planning, Communications, Policy, and a District Executive/ other District staff.
6. Establish a quarterly status reporting process to PennDOT leadership.
7. Present, twice a year, status and progress updates to the TAC and STC for 2023 and 2024, at minimum.
8. Communicate externally on activity, progress, and upcoming activity to the wide range of stakeholders on progress and upcoming efforts on a bi-annual basis.
9. Establish appropriate linkages between the report's implementation and organizational and individual goal-setting, budgeting, etc.
10. Develop a set of measures of success and/or measures of effectiveness from which to evaluate the impact and benefits of the effort.

Closing Reflection: Pennsylvania Aviation System

The premise for carrying out this TAC study is that Pennsylvania aviation is a system of public-use aviation facilities. State government should periodically evaluate the state of the system. The Commonwealth has a unique and legitimate role to ensure the safe performance of that expansive system. The mobility and economic well-being of our citizens and businesses depend on it.

There will be many organizations, public and private, that implement TAC's funding and strategy recommendations in partnership. The timing for this review was ideal; it is now time to act on this assessment.

TAC offers this closing reflection for the implementing partners as they move forward: Will 2023 be a sunset of a great era of aviation development or a sunrise for new horizons and a bright tomorrow?



courtesy of
Jim Thompson