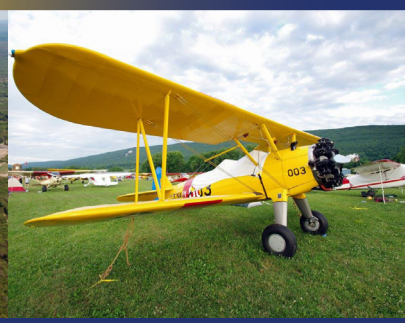
Pennsylvania Statewide Airport System Plan (PA SASP)

Technical Report

Volume I (Update 2012)

Volume II (Update 2016)



Commonwealth of Pennsylvania | Department of Transportation | Bureau of Aviation

Pennsylvania Statewide Airport System Plan (PA SASP)

Technical Report

Volume I (Update 2012)
Published in June 2014 (Prepared by Parsons Brinckerhoff, Inc.)

Volume II (Update 2016)
Published in March 2018 (Prepared by AECOM Technical Services, Inc.)

Prepared for: Pennsylvania Department of Transportation, Bureau of Aviation

Cover Images:

From left to right: University Park Airport (UNV), New Garden Flying Field (N57), Bradford Regional Airport (BFD), William T. Piper Memorial Airport (LHV)

All images obtained from the official Facebook pages of the respective airports.

The Pennsylvania Department of Transportation's Bureau of Aviation would like to sincerely thank the members of the Project Oversight Committee for their assistance in completing this update to the System Plan.

The preparation of this document was financed in part through a grant from the Federal Aviation Administration (FAA). The contents of this report reflect the views and findings of the consultant, and do not necessarily reflect the official views or policy of the FAA.

TABLE OF CONTENTS

PREFACE

The last comprehensive Pennsylvania Statewide Aviation System Plan (PA SASP) was completed in 2002. A partial update to several sections of the plan was prepared during 2007. Five years later, another full PA SASP Update was scheduled to be completed during the 2012 timeframe. However, following the enactment of new transportation funding legislation under Act 89 of 2013, creating a new Deputate for Multimodal Transport at the Pennsylvania Department of Transportation (PennDOT), the 2012 PA SASP, was suspended after the completion of five chapters, including goals and objectives, inventory, forecasts, airport classifications, and state and local aviation issues.

At that time, the extent of funding availability and the organizational impact of PennDOT's Bureau of Aviation (BOA) was not entirely clear until the recently approved legislation formulated new funding mechanisms. Since PennDOT's Long Range Transportation Plan was published in August 2016, organizational structures and funding options were clearly defined. Therefore, a decision was made to complete the remaining chapters of the suspended 2012 PA SASP and update specific sections where needed in a 2016 version. This 2016 PA SASP Update is seen as a continuation of the 2012 PA SASP Study. Overall, this latest Update addresses the following:

- Review and update the inventory and forecast results from the suspended 2012 PA SASP to 2016.
- Identify airport needs and requirements, and provide recommendations to improve the air transportation system.
- Evaluate the impact of completed airport improvements on the overall performance of the state system, and estimate overall return on investment.

This Technical Report consists of two volumes featuring the chapters and appendices as written and published in the 2012 Update, and the recently completed chapters and appendices under the 2016 Update:

- **Volume I**: Chapters 1 – 5 and Appendices A – D of the 2012 PA SASP Update, *published in June 2014 (Developed by Parsons Brinckerhoff).*
- **Volume II**: Chapter 6 – 10 and Appendices E – H of the 2016 PA SASP Update, *published in March 2018 (Developed by AECOM).*

EXECUTIVE SUMMARY

1. Purpose and Goals

The Pennsylvania Statewide Airport System Plan (PA SASP) provides the Pennsylvania Department of Transportation (PennDOT), Bureau of Aviation (BOA) with the tools necessary to make decisions about the preservation, enhancement, and promotion of its air transportation system, as economic, industry, and regulatory changes continue to pose new aviation challenges in the Commonwealth.

The PA SASP's performance measures and goals are outlined in **Table 1**. Both the 2002 and 2007 SASP studies served as the baseline from which they were evaluated and developed in collaboration with the stakeholder Project Oversight Committee.

Table 1: 2012 and 2016 PA SASP Performance Measures and Goals

Performance Measure	Goal
Accessibility	Provide an airport system that is accessible from both the air and ground
Optimization Potential	Support an airport system that is able to meet the demand of its users by optimizing facilities
Activity/Demand	Support an airport system that maintains the flexibility to respond to changes in future demand
Support/Commitment	Promote and preserve an airport system that is supported by airport sponsors and local communities
Facilities	Support users by optimizing facilities while maximizing the system-wide benefit of aviation investments

2. Overview of the PA SASP Update

The latest Technical Report developed as part of the PA SASP is divided into two volumes, one outlining the findings from the 2012 Update published in June of 2014 and another for the analysis and conclusions found in the 2016 Update published in March of 2018. The 2016 Update is intended to complement the work already completed under the 2012 Update, which was suspended following the enactment of new transportation funding legislation in 2013. Both documents compile all tasks associated with industry research, data collection and documentation. **Table 2** highlights the tasks and chapters prepared under each Update.

Table 2: Summary of Tasks under the 2012 and 2016 PA SASP Updates

Chapter		2012 PA SASP Update	2016 PA SASP Update
Volume I	1	**Establish Pennsylvania airport system goals and objectives**	*No changes*
	2	**Update and evaluate the Statewide Airport System Inventory database**	*Reviewed and updated (Chapter 6)*
	3	**Develop aviation forecasts**	*Reviewed and updated (Appendix G)*
	4	**Evaluate and modify airport classification criteria**	*No changes*
	5	**Analyze the major trends and issues that influence PA airports**	*No changes*
Volume II	6	*Updated (Chapters 2 and 4)*	**Review and update existing inventory and airport classifications**
	7	*Completed in 2016 PA SASP Update*	**Establish the adequacy of the existing Pennsylvania airport system and determine its requirements**
	8	*Completed in 2016 PA SASP Update*	**Develop a summary of priorities and an implementation plan**
	9	*Completed in 2016 PA SASP Update*	**Evaluate the impact of individual airport improvements on the performance of the airport system**
	10	*Completed in 2016 PA SASP Update*	**Summarize key findings**

3. Updated Inventory

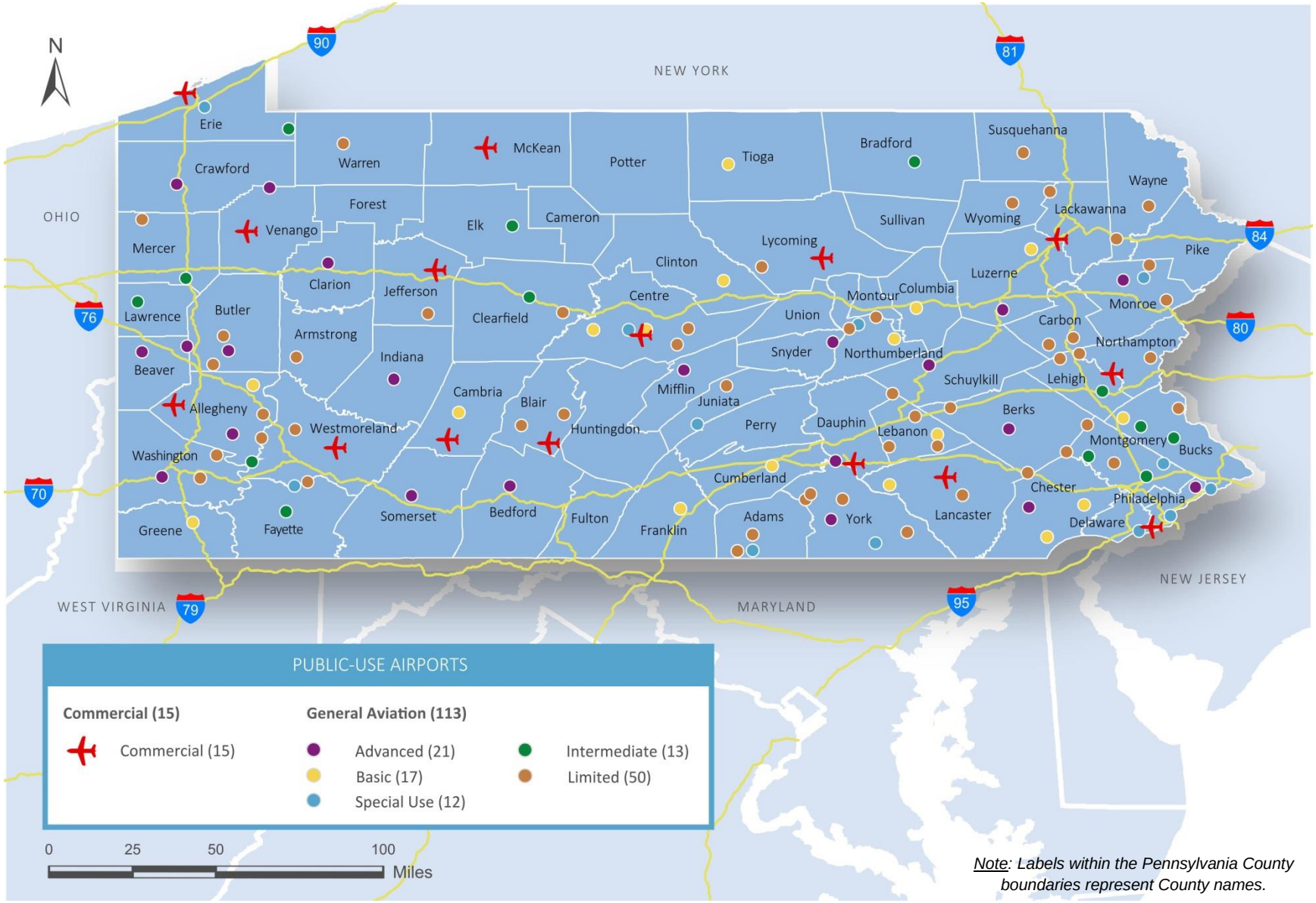
Since the suspension of the 2012 PA SASP study, there have been a few changes to the existing inventory. These include closed facilities, new airport names, and major modifications of physical facilities at PA SASP airports:

- **Airport Closures**
  - McGinness Field (8N7)
  - Hanover Airport (6W6)
  - Shippensburg Airport (N42)
- **Name Changes**
  - Hazleton Municipal Airport to Hazleton Regional Airport (HZL)
  - Rock Airport of Pittsburgh to Pittsburgh Northeast Airport (9G1)
  - Butler County Airport to Pittsburgh-Butler Regional Airport (BTP)
- **Upgraded Facilities**
  - McVille Airport (6P7)

Other inventory changes were noted at various airports and target different components, including runway length, width and strength, taxiways, approach instruments and lights, and ground services and facilities, among others. Updated inventory tables can be found in **Appendix E**.

The closure of the three airports listed previously brings the total number of PA SASP airports down from 131 in the 2012 Update to 128 in the 2016 Update. The 2016 PA airport system map is displayed in **Figure 1**.

Figure 1: 2016 PA SASP Airports and Classifications (*As of May 2017*)



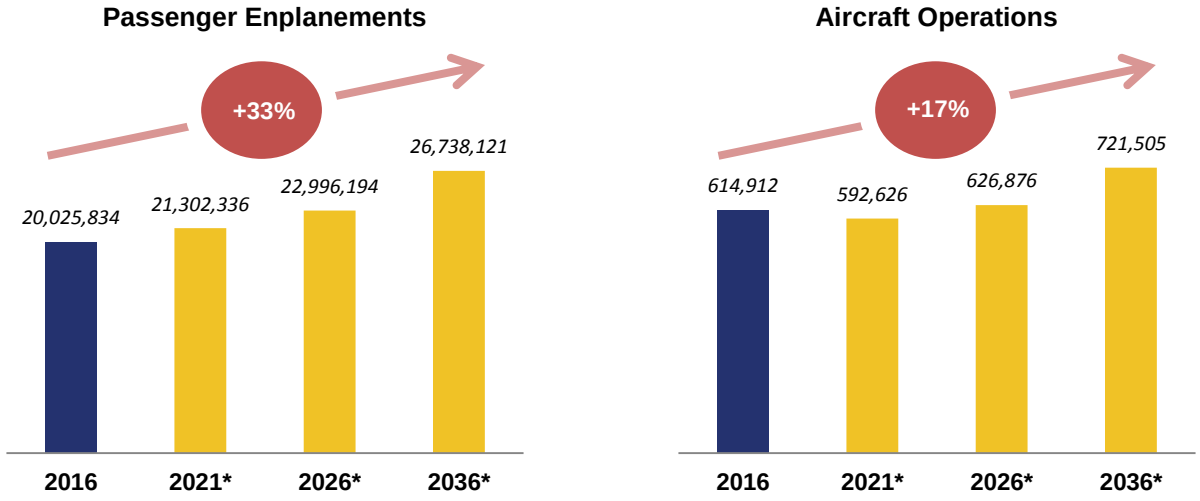
Note: Labels within the Pennsylvania County boundaries represent County names.

4. Updated Forecasts

The revised aviation activity projections developed as part of the 2016 PA SASP update those of the previous forecasts completed under the suspended 2012 PA SASP. The same forecast methodology was used in both studies.

Based on the 2016 updated forecasts, passenger enplanements at Pennsylvania's Commercial airports are expected to grow by approximately 33 percent between 2016 and 2036, from 20.0 million to 26.7 million enplanements. Commercial aircraft operations are forecasted to increase from approximately 615,000 to 721,000 operations over the same timeframe, or by 17 percent. **Figure 2** summarizes the forecasts for passenger enplanements and commercial aircraft operations in Pennsylvania.

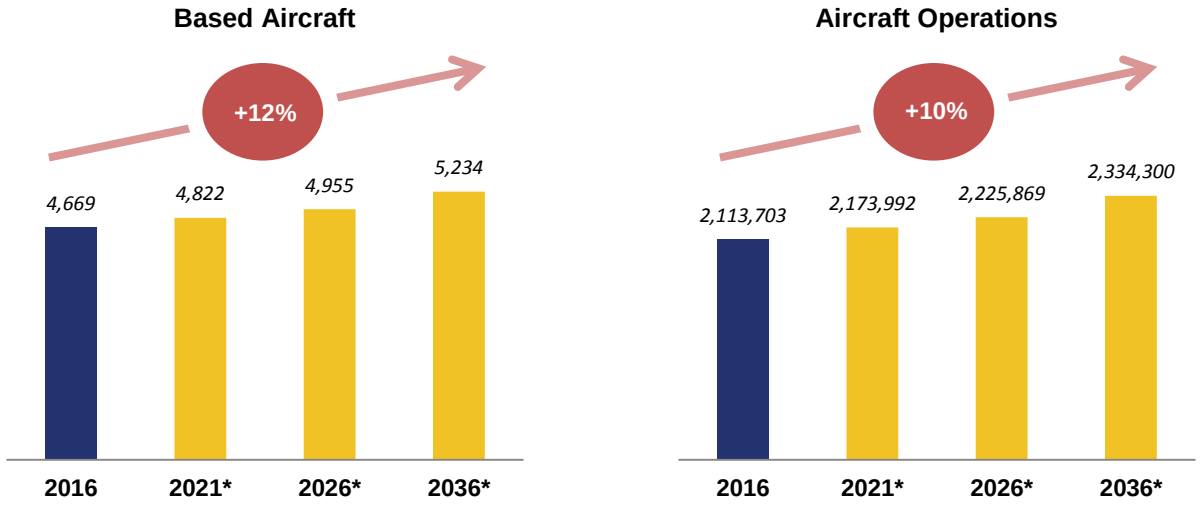
Figure 2: Commercial Aviation Activity Projections (2016 – 2036)



*Source: FAA, Compiled by PennDOT - BOA; *Forecast Years*

In terms of General Aviation (GA) activity, based aircraft are projected to increase by approximately 12 percent, from 4,886 to 5,234 aircraft, between 2016 and 2036. GA aircraft operations can anticipate a 10 percent rise in the next twenty years as well, from 2.1 million to 2.3 million operations. **Figure 3** displays the forecasted trends in non-commercial and GA activity in the Commonwealth.

Figure 3: Non-Commercial and GA Activity Projections (2016 – 2036)



*Source: PennDOT - BOA; *Forecast Years*

5. State and Local Aviation Issues

Significant economic, industry, and regulatory trends and issues present challenges to the national aviation system, and additional issues influence Pennsylvania's airports specifically. For this study, three critical issues were identified as potentially having a noticeable impact on Pennsylvania's airport system, as highlighted in **Table 3**.

Table 3: Trends and Issues Affecting Pennsylvania Airports

Increasing fuel costs
• Increases operating costs • Reduces air travel demand, fuel demand, and fuel tax revenue • Spurs changes in aircraft and flight patterns • Increases demand for alternative fuels
Protecting airspace and upgrading runway approaches
• Obtaining a preferred approach offers safety and access benefits • Airspace obstructions can include vegetation, structures, mobile objects, and towers • Airports and communities must be proactive with land use decisions to preserve airspace and accommodate future airport improvements
Community opposition/acceptance of airport development, including land development and environmental permitting
• Residents may oppose airport infrastructure projects, considering only the impact of airport operations and not the benefits the airport brings to their community • Airports must be actively engaged with the public and in the local community planning and economic development process

6. Airport Classification

The 2002 PA SASP set the groundwork for the airport classifications that are used in Pennsylvania's system of airports. Subsequent changes and/or additions took place in the 2007 and 2012 Updates. Classifications enable the BOA to more effectively assess the performance of system airports, and ultimately better prioritize funding for improvement projects.

Airports are classified based on their runways and navigational facilities, which dictate the type of aircraft and aviation operations they can handle. Classification criteria have remained the same between the 2012 PA SASP and the 2016 Update, as detailed below:

Class Criteria:

- Runway Length
- Published Approach
- Runway Lights

Performance Criteria:

- Runway Width
- Runway Strength
- Parallel Taxiway
- Approach NAVAIDS
- Weather Equipment
- Services
- Facilities

The BOA has defined a list of facility and service objectives under each criterion which vary by airport classification. They are listed in Table 4-2 of the 2012 PA SASP (Volume I).

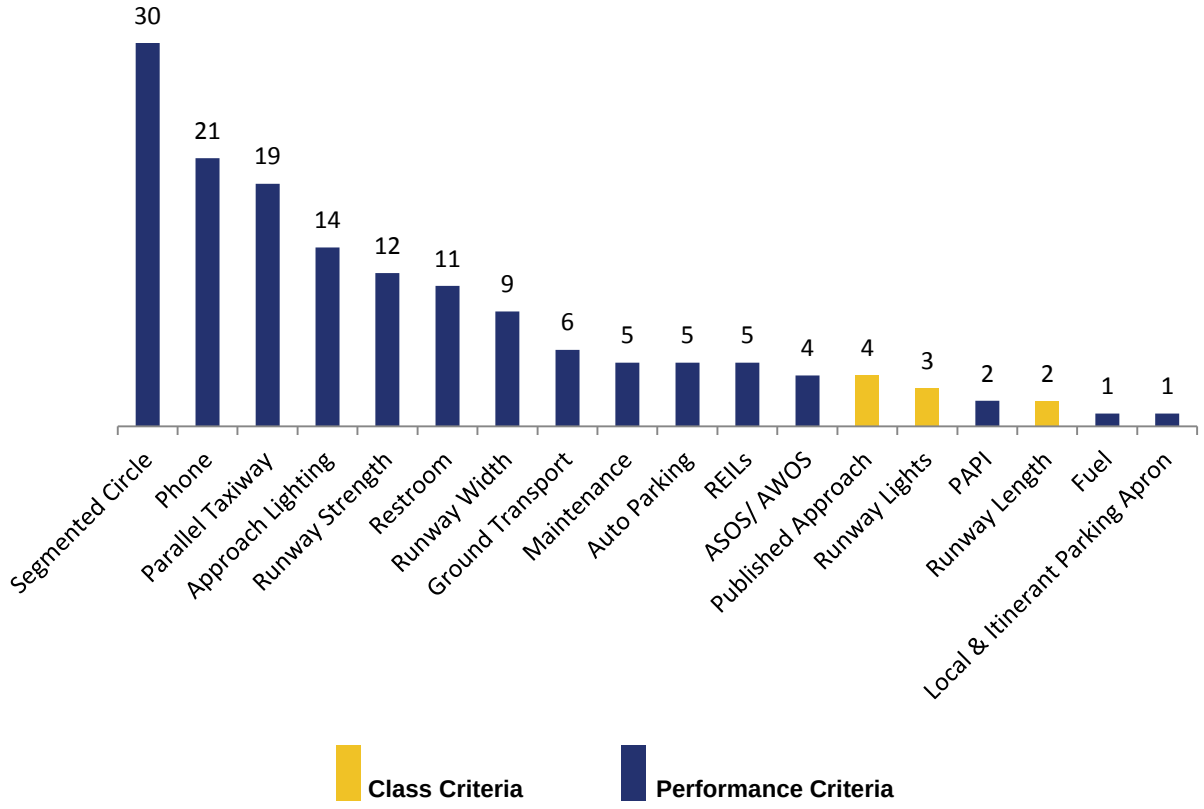
The Federal Aviation Administration (FAA) categorizes airports in its National Plan of Integrated Airport System (NPIAS). GA airports defined in the NPIAS are divided into categories based on the results of the 2012 study General Aviation Airports: A National Asset (ASSET).

Because ASSET categories are based on activity measures at the 63 PA NPIAS airports while the PA SASP classification at all 128 PA public-use aviation facilities are based on Class and Performance criteria, there are no direct relationships between the two system plans. However, ASSET categories were referenced in the development of the PA SASP's Implementation Plan.

7. System Requirements

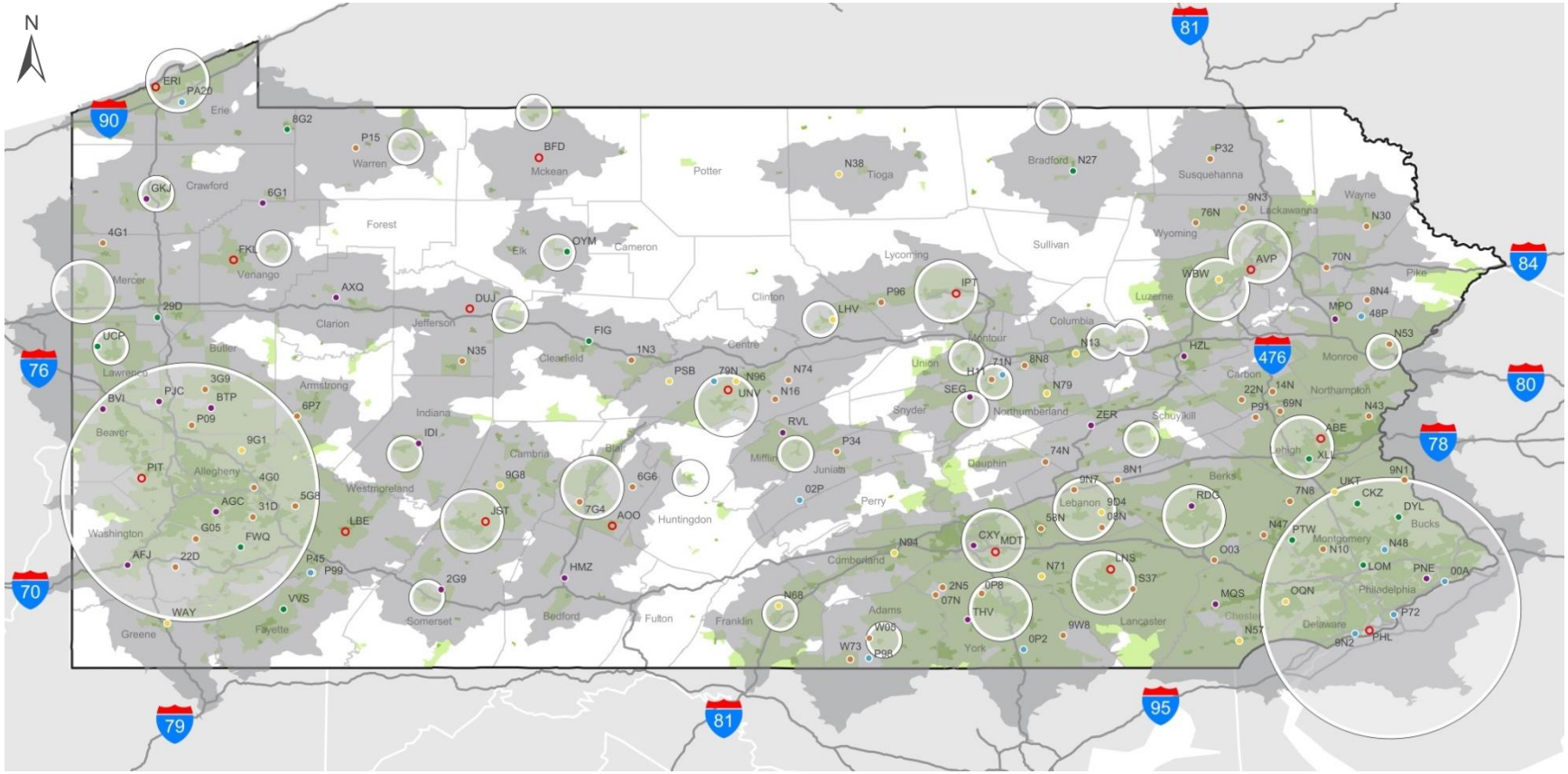
This chapter identifies the needs of the air transportation system that will help accommodate Pennsylvania's aviation demands. As part of the analysis, airports are evaluated using a variety of performance measures to determine their ability to continue meeting their classification criteria, as established in the PA SASP. **Figure 4** depicts the most common performance measures, or objectives, that remain unmet by the individual PA airports. They include specific runway characteristics as well as facilities and equipment needs that should exist at each SASP airport depending on its classification.

Figure 4: Number of Airports by Unmet Objectives



To complement the needs assessment, a separate drive time analysis measures car accessibility levels of the state's population to all system airports. Overall, as highlighted in **Figure 5**, 96 percent of Pennsylvanians are within a 30-minute drive to a system airport. Minor gaps do exist in certain areas, including the northern portions of Wayne and Pike Counties and the northeastern suburbs of the Pittsburgh metropolitan area in Allegheny and Armstrong Counties.

Figure 5: 30-Minute Drive Time Map to All System Airports



The third component of the System Requirements chapter derives a methodology to identify the most critical deficiencies and constraints in the airport system. The approach is based on a weighted scoring system that rates airports on a scale of zero to 100 percent according to their current level of meeting classification objectives. The least performing airports are shortlisted for a constraints analysis which determines their ability to accommodate certain upgrades in order to better meet their classification objectives.

Overall, the majority of airports, 95 of 116, scored above 90 percent. Three airports are found to be most deficient, with performance scores below 75 percent, considerably less than the average score of the majority of airports in the PA SASP. These facilities, which possess major objective needs, have been analyzed in more detail to identify physical constraints and any expansion potential, as outlined in **Table 4**.

Table 4: Constraints Matrix of Most Deficient Airports

Airport	Score	Objective Needs[2]	Major Constraints	Ability to Address Constraints	Future Expansion Potential
Intermediate					
Doylestown Airport (DYL)[1]	70%	- Runway Length - Runway Width	Community opposition and off-airport development	Limited	Low
Heritage Field Airport (PTW)[1]	75%	- Runway Length	None	Possible: Potential extension of Runway 10/28 to the west	Medium - High
Basic					
Brandywine Airport (OQN)	73%	- Runway Lights - Runway Width - Runway Strength - Segmented Circle - Public Phone	None	Possible: Current plans to repave runway	Constrained

[1]*These airports were reclassified in 2007 and were not reclassified a second time in 2012.*
[2]*Any airport facility, service or equipment need requires a local or bottom-up justification through master planning or document operational need.*

8. Implementation Plan

The implementation plan lists the major PA SASP priorities that need to be addressed in the near future in order to secure a more resilient and modern airport system in the Commonwealth. The prioritization focuses particularly on the portion of PA SASP facilities identified as Core Airports, which generally provide higher performance levels than the remaining public-use facilities referred to as System Airports, due to their larger size, more advanced facilities, and higher share of state aviation activity. A total of 70 airports are considered to be Core facilities, with the remaining 58 serving as System Airports. They are broken down into the following categories:

Core Airports including:

- Primary airports as defined in the FAA's NPIAS
- Non-primary airports as defined in the FAA's NPIAS that are also classified in the FAA's ASSET report
- Non-NPIAS airports that serve a Core Airport role by providing system coverage to population centers not covered by a NPIAS airport's service area or possess 2016 activity levels equal to or exceeding FAA ASSET National or Regional categories. These airports could potentially meet NPIAS entry criteria if they were publicly-owned
- Public Special Use facilities identified as being an essential transportation asset by its Metropolitan Planning Organization (MPO), Regional Planning Organization (RPO) and the BOA

System Airports including:

- All other public-use facilities not classified as Core Airports

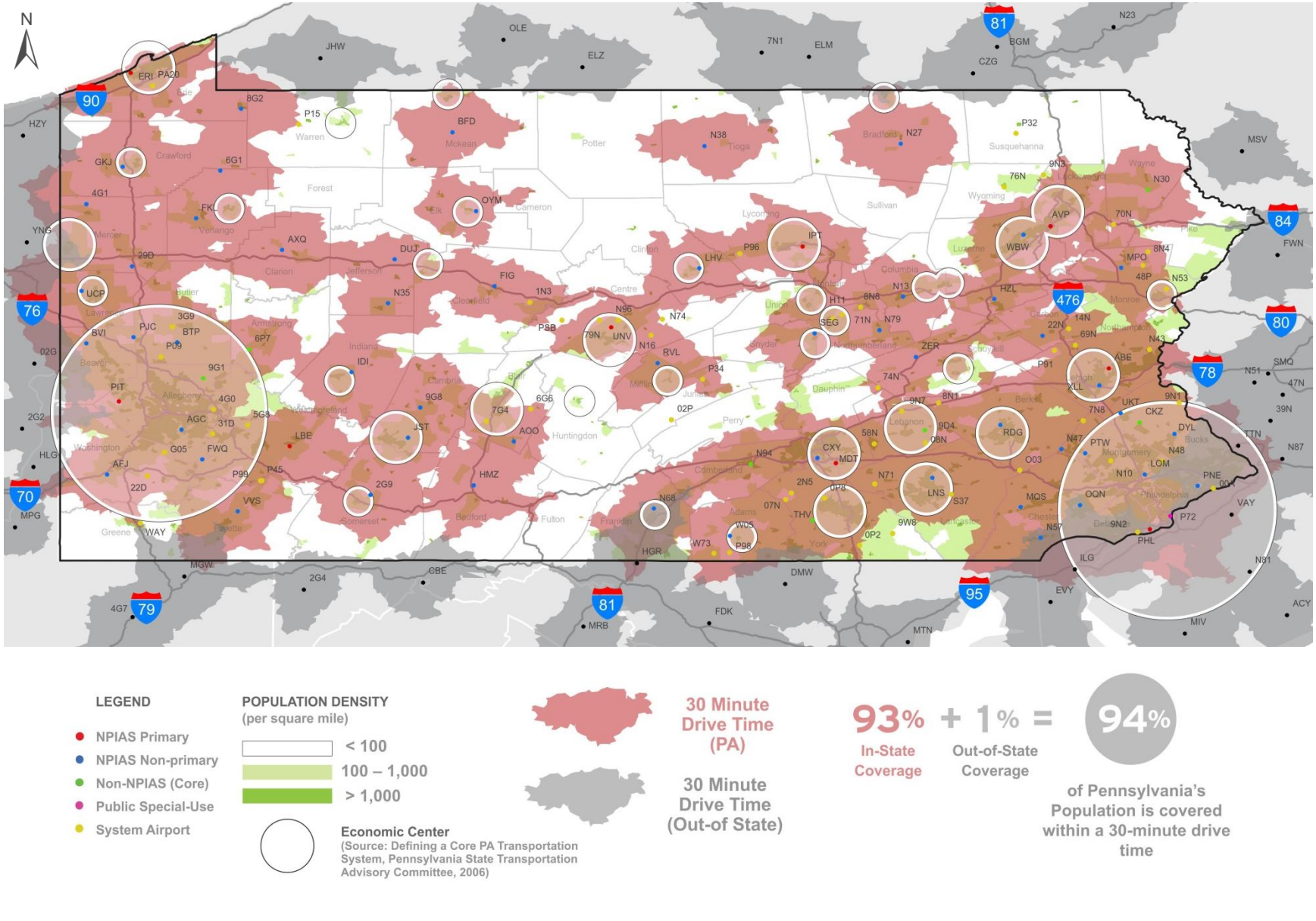
In order for Core Airports to continue accommodating growth in Pennsylvania, a number of key priorities are recommended to be addressed in the near future:

1) Maximize drive time accessibility of population and economic centers, and reduce identified gaps
2) Implement, along with system preservation and economic development needs, feasible upgrades and expansions justified through the master planning process or documented operational need
3) Ensure operational capacity will accommodate future demand

The Pennsylvania airport system is in a solid and functional shape. With only a few exceptions, most airports currently meet the vast majority of their performance objectives based on their classification, and will be capable of accommodating future demands as identified in this PA SASP. With regards to accessibility, the state's Core Airports provide 30-minute drive time coverage to 93 percent of Pennsylvania's population as well as most major economic centers. For illustration purposes, the ultimate airport system drive time map is shown in **Figure 6**.

Moving forward, the funding emphasis for Core and System Airports should focus on system preservation (including safety) and economic development, which would foster optimization and/or promote and preserve a sustainable airport system. Then typically Core Airports could be considered for upgrade and expansion projects that are feasible and justifiable through the master planning process or documented operational need.

Figure 6: Recommended 30-Minute Drive Time Core Airports Map



9. Impact of Completed Airport Improvements

In this chapter, a methodology for quantitatively and qualitatively assessing the benefits of specific airport improvements on the overall performance of Pennsylvania's airport system is developed. Five case studies involving recently completed projects at PA SASP airports were undertaken as a means of evaluating the Return on Investment (ROI). The following five airports are included in the case studies: Indiana County Airport (IDI), New Garden Flying Field (N57), Pocono Mountains Municipal Airport (MPO), Erie International Airport (ERI), and McVille Airport (6P7). Types of airport improvements range from runway extensions and reconstructions to hangar expansions and construction of parallel taxiways.

The methodology involves an assessment of existing conditions followed by an impacts evaluation of both quantitative and qualitative factors. Various tools are used as part of the analysis. First, a survey questionnaire, completed by the airports, provides detailed information on the airport improvements, the benefits the airport recognizes from them, and changes to on-airport businesses and employment. Second, the Project Contribution Calculator which models changes to annual operations and capacity, and the Economic Impact Calculator utilized to predict fluctuations in the number of jobs and airport revenue, both offer additional input.

The return on investment is based on a scoring system that takes into account changes in the quantitative and qualitative impacts identified for each airport. In this analysis, ROI is not quantified by a dollar amount, but rather rests on a High/Medium/Low prioritization index. The results are detailed in **Table 5**.

Table 5: Overall Return on Investment (ROI) Assessment from Select Airport Improvements

Airport ID	Type	Cost	Quantitative Impacts (2010 – 2016)				Qualitative Impacts (As Reported in Surveys)					Overall Return On Investment
			Operations (% Change)	Based Aircraft (% Change)	On-Airport Businesses (% Change)	On-Airport Employment (% Change)	Aircraft Type Changes	Aircraft Stage Length	Design Standard Compliance Airfield Safety	Off-Airport Business Development	Airport Services Changes	
IDI	Runway Extension	$19,489,403	2%	11%	0%	6%	High	Medium	High	Medium	Low	**Medium** (4.2)
N57	Runway Reconstruction, Parallel T/W, Hangars	$12,255,812	35%	16%	200%	78%	Low	N/A	High	Low	Low	**High** (6.0)
MPO	Runway Extension	$6,043,170	10%	126%	300%	380%	High	Medium	Medium	Medium	High	**High** (7.9)
ERI	Runway Extension	$80,570,950	5%	44%	-14%	78%	Low	Medium	High	Low	Low	**Medium** (4.3)
6P7	Runway Reconstruction	$1,625,000	N/A	N/A	100%	0%	Low	Medium	High	Low	Medium	**Medium** (3.3)

LEGEND

Quantitative Impacts (Double Weight)

Score

0	No/Negative Growth (< 0%)
1	Low Growth (0% - 9%)
2	Medium Growth (10% - 99%)
3	High Growth (>100%)

Qualitative Impacts (Single Weight)

Score

1	Low
2	Medium
3	High

Return on Investment

Score

	Low (1.0 – 2.9)
	Medium (3.0 – 5.9)
	High (6.0 – 9.0)

10. Summary of Findings

Table 6 below presents the key findings of the 2016 PA SASP Update, compiled for each chapter.

Table 6: Summary of Findings in the 2016 PA SASP Update

Forecasts (2016 – 2036)
➢ **Passenger enplanements** +33 percent growth
➢ **Commercial aircraft operations**: +17 percent growth
➢ **GA based aircraft**: +12 percent growth
➢ **GA aircraft operations**: +10 percent growth
System Requirements
➢ **Most airports meet their classification criteria** o *95 out of 116 airports have a performance score greater than 90 percent*
➢ **Certain facility upgrades are recommended, if feasible and justifiable, to improve overall system performance**, particularly at facilities with a performance score below 75 percent
➢ **No classification upgrades or downgrades are recommended**
➢ **Pennsylvania's population has sufficient automobile access to system airports**. In total, 96 percent have access to any system airport in less than a 30-minute drive ➢ Minor access gaps do exist in certain counties: o *Northern portions of Wayne and Pike Counties* o *Northeastern suburbs of the Pittsburgh metropolitan area in Allegheny and Armstrong Counties*
Implementation Plan
➢ **Core and System Airports' funding emphasis should focus on system preservation and economic development**
➢ **Core Airports typically then could be prioritized for all essential airfield improvements** and other upgrades that increase capacity where needed, if feasible and justifiable
➢ **Three major priorities** should be addressed in the near future: o *Maximizing drive time accessibility of population and economic centers, and reducing identified gaps* o *Implement, along with system preservation and economic development needs, feasible upgrades and expansions justified through the master planning process or documented operational need* o *Ensuring that operational capacity will accommodate future demand*
➢ Overall, the **PA air transportation system is in a good shape**: o *The average performance score of airports is 94 percent, indicating solid facilities* o *Although forecasts indicate a rise in based aircraft and operations, there is enough capacity to accommodate future growth* o *93 percent of PA's population has access to a Core Airport in less than a 30-minute drive*

Table 6: Summary of Findings in the 2016 PA SASP Update (Continued)

Selected Airport Improvements: Return on Investment
➢ **Case study airports generated a medium to high Return on Investment (ROI)**, based on both quantitative and qualitative impacts: ○ ***Indiana County Airport - IDI*** *(Runway Extension): Medium ROI* ○ ***New Garden Flying Field - N57*** *(Runway Reconstruction): High ROI* ○ ***Pocono Mountains Municipal Airport - MPO*** *(Runway Extension): High ROI* ○ ***Erie International Airport - ERI*** *(Runway Extension): Medium ROI* ○ ***McVille Airport - 6P7*** *(Runway Reconstruction): Medium ROI*
➢ **Two major trends identified**: ○ *Large investments do not always result immediately in the highest returns, but have the ability to do so in the future* ○ *Airport location and proximity to large business centers greatly enhance growth potential, and ultimately return on investment*