Delaware Department of Transportation
Federal Aviation Administration

DELAWARE AVIATION SYSTEM PLAN

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Phase II Report

Delaware Aviation System Plan 2019 Update

Phase 2 Report - Chapters 5-8

Prepared for:

Delaware Department of Transportation
Federal Aviation Administration

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TABLE OF CONTENTS

CHAPTER FIVE - IDENTIFICATION OF ALTERNATIVES

CHAPTER SIX: EVALUATION OF ALTERNATIVES

CHAPTER SEVEN: RECOMMENDED AVIATION SYSTEM

TABLE OF CONTENTS (Cont.)

CHAPTER EIGHT: FINANCIAL & IMPLEMENTATION PLAN

LIST OF FIGURES

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

TABLE OF CONTENTS (Cont.)

Chapter 5

Identification of Alternatives

IDENTIFICATION OF ALTERNATIVES

THE STATE AVIATION SYSTEM PLAN UPDATE (PHASES I and II) is taking a fresh look at the classifications of airports and heliports and providing guidelines for their orderly development. The study serves as a forum for public input to the State aviation policy decision process. Review and comment from the Delaware Aviation Advisory Council, combined with the input from State and local agencies and interested general public are important factors in deciding the course of aviation priorities and issues. When completed, the system plan will generate valuable management information on the funding and development of the public-use airport system. In Phase I of the State Aviation System Plan, four work Tasks were undertaken:

- Task 1: Issues, Goals, and Objectives
- Task 2: Analysis of Existing System
- Task 3: Forecast of Aviation Demand
- Task 4: Airport Capacity Analysis
- Task 5: Existing Airport and Heliport System Requirements

Figure 5-1 – Delaware Airpark Runway 9 Approach

Phase II of the State System Plan incorporates the following work Tasks:

- Task 6: Identification of Aviation System Alternatives
- Task 7: Evaluation of Aviation System Alternatives
- Task 8: Selection and Description of Recommended System
- Task 9: Financial and Implementation Plan
- Task 10: Coordination and Documentation

This chapter of the report addresses Task 6. Given the recent changes in the funding structure of the aviation system the first section deals with the context of the current aviation system as it impacts potential alternatives.

1. EXISTING AVIATION SYSTEM CONTEXTUAL FACTORS

A NUMBER OF CHANGES HAVE TAKEN PLACE since the last Delaware aviation system plan was completed. Some of these changes will have a significant impact on the future aviation system. Others will not change the direction or course of system development.

1.1 FACTORS IMPACTING THE IDENTIFICATION OF ALTERNATIVES

A brief listing of recent influential factors that impact the identification of alternatives includes:

- ***New Sources of State Funding:*** In 2019, a new law was passed, allowing a $0.05 per gallon tax on jet fuel. The proceeds of this tax are directed at the public-use aviation system. This change gives new life to privately-owned, public-use airports regarding their infrastructure development and maintenance. It will also help Delaware's NPIAS airports with routine maintenance projects each year.
- ***Implementation of ADS-B:*** The implementation in 2020 of the Automatic Dependent Surveillance – Broadcast will transform all segments of aviation, permitting real-time precision, shared situational awareness, and advanced applications for pilots. In addition, the availability of ADS-B data may end up changing the way operations are counted at Delaware airports.
- ***Pandemic Quarantines:*** Early in 2020, the COVID-19, also known as the Corona Virus, has impacted the demand for aviation services worldwide. Elimination of international and cutbacks for domestic flights has reduced demand for air travel and if this continues for an extended period, it will hurt the aviation industry. Already, the virus will impact the launch of Frontier service at ILG. One unanticipated side-effect may be the increase in use of general aviation (GA) business aviation flying. To minimize the risk of contagion, some companies are flying their employees using GA. This has already created an uptick in GA business flying.
- ***Civil Air Terminal Marketing:*** DelDOT has put significant effort into getting the CAT ready for third party use by an aviation company. This includes the development of a marketing study, renegotiation of the Joint-Use Agreement, and preparation of a Request for Proposal to offer the CAT to developers for aviation purposes. Expanded use of the CAT could bring significant economic impacts to central Delaware.

Figure 5-2 - NASCAR Use of Civil Air Terminal

- ***Expansion of the Chorman Airport Network:*** Chorman Airport has grown in recent years with the doubling of based aircraft. In addition, the Chorman aerial spray operation continues to expand, using other privately owned airports in Delaware, including Smyrna, Laurel, and one or more privately-owned, private-use airports. The increased business use of the privately-owned system airports enhances their viability over the long term.
- ***Changing Role of ILG:*** The announced airline service, beginning in April of 2020 by Frontier Airlines will change the role and usage of New Castle Airport. In addition to this carrier, other airlines have expressed interest in serving the facility. Significant investments

have been made in the terminal building and parking areas to accommodate this new demand.

- ***Need for New Regulations and Priority Ranking Method:*** Given the new funding streams for the general aviation system, new regulations and a priority rating system are needed to ensure the added funding is distributed equitably and to the most important projects.

Some of these items were identified as issues in Chapter 1 of the Phase 1 report. When considering these contextual changes, the identification of alternatives becomes more relevant to the system needs. The other system issues that were identified at the outset of Phase 1 study that can impact the identification of alternatives are listed in the next section.

1.2 OTHER SYSTEM ISSUES

Other system issues that will be integrated into the identification of alternatives include the following:

- ***UAS Integration into Delaware Aviation System:*** In 2015, the UAS Task Force identified a range of issues associated with the integration of UAS vehicles into full economic commerce and development in Delaware. There were remaining objectives that the Task Force did not fully examine, but instead were recommended for further study. More recently, Uber Elevate has put forth plans to deploy drone-like vertical takeoff and landing electric tiltrotor type aircraft for urban air mobility transportation.

Figure 5-3 - Drone Use at Summit Airport

- ***More Detailed Facility Requirements than "System Plan Level":*** The system plan should examine the creation of facility "must haves" for private airports (Level 1, 2, 3, etc.) Details would cover facility items such as runway length, paving needs, airspace obstructions, development standards, and other safety and operational issues.
- ***Consideration of Geographic Coverage/Acquisition of Private Airport:*** In previous statewide aviation system plans, this implicated the need for Laurel Airport to remain open. If threatened with closure, the system plan alternatives could examine the costs and benefits of State acquisition of the facility.
- ***Development of Public-Use Heliports in Demand Areas:*** In a previous study, both the city of Wilmington and the southern beach communities were identified as possible demand areas for public-use heliports. The system alternatives will examine whether or not this demand still exists, and if so, what the interest of the State may be in providing facilities or partnering with private enterprise to do so. Given the Urban Elevate plans, consideration needs to include potential vertiport development in Wilmington.

- ***Potential Development of Civil Air Terminal/Possible Extension of Delaware Airpark Runway:*** Given the new runway location at Delaware Airpark and the possible development of the CAT for commercial purposes, a mini-system analysis is needed for interaction between Delaware Airpark and the CAT. It is possible that demand for a longer runway exists at Delaware Airpark and if so, the feasibility of such a project will be examined at a preliminary level of detail.
- ***Land Use Compatibility Measures/Encroachment Analyses:*** A continuing issue with airports and residential development around them is the nature of continued expansion on both sides. Potential solutions will be analyzed that employ zoning, easements, and other means of avoiding or mitigating these conflicts.
- ***Future Technology Impacts to the Delaware Aviation System:*** To date, no state aviation system plan for Delaware has examined the potential impacts of future technology on the aviation system. This would include the possible deployment of electric aircraft, Uber/Lyft air taxi service, self-driving cars, virtual reality, drone-carried air freight, etc.

1.3 SUMMARY OF PHASE 1 FINDINGS

Phase 1 of the system plan included documentation of the existing aviation system, forecasts of aviation demand, a capacity analysis, and facility needs assessment. These findings will be used in the development of alternatives. Brief findings from each of these tasks are described below.

Existing Aviation System

- ***Airport and Heliport Facilities:*** Currently, there are nine (9) public-use airports and one (1) joint military-civilian use airport in the State, along with one (1) public-use helistop. Of these eleven (11) aviation facilities, five (5) are privately owned. Eight (8) have paved surfaces, while the remaining three (3) have turf surfaces.
- ***Aeronautical Activity:*** Historical levels of aviation activity at system airports have declined in recent years. Total existing based aircraft = 432; total annual aircraft operations = 156,200 (5,200 of these are military aircraft operations).
- ***Fuel Sales by Airport:*** In 2018, a total of 4,526,100 gallons of jet fuel were sold – 86 percent at New Castle Airport.
- ***Land Use Around System Airports:*** Significant changes in residential land use near Delaware's system of airports have mostly occurred near Delaware Coastal, Delaware Airpark, and Summit Airport. New Castle Airport has not had new residential construction, as there is little or no land available near the airport for such development.
- ***Socioeconomic Base:*** For the State, there has been a 9.8 percent growth in population over the 2008-2018 period, growing from 883,874 to 970,727. Overall employment for Delaware grew by 8.9 percent for the same period. Per capital personal income (PCPI) averaged $47,099 in 2018, which is slightly below national averages. However, PCPI is anticipated to grow by 1.1 percent per year through 2040.
- ***Statutes and Regulations:*** The State has aviation laws and regulations covering a wide

range of operational concerns including airport licensing, obstruction removal, aircraft operation, and DelDOT services to airport operators.

- ***Future Technology:*** Across multiple industries, disruptive innovations are occurring at a rapid pace. Some of the new technology that is either already here or coming soon includes: Electric Aircraft; Autonomous Cars; Flying Taxis; Virtual Reality; Unmanned Aerial Systems (UAS) Integration; and New Airport Sustainability Practices.

Forecast of Aviation Demand

- ***Forecast Aviation Activity:*** Total based aircraft are forecast to grow from 432 in 2018 to 561 by the year 2040. Aircraft operations are anticipated to grow from 156,200 to 218,900 during the same period.

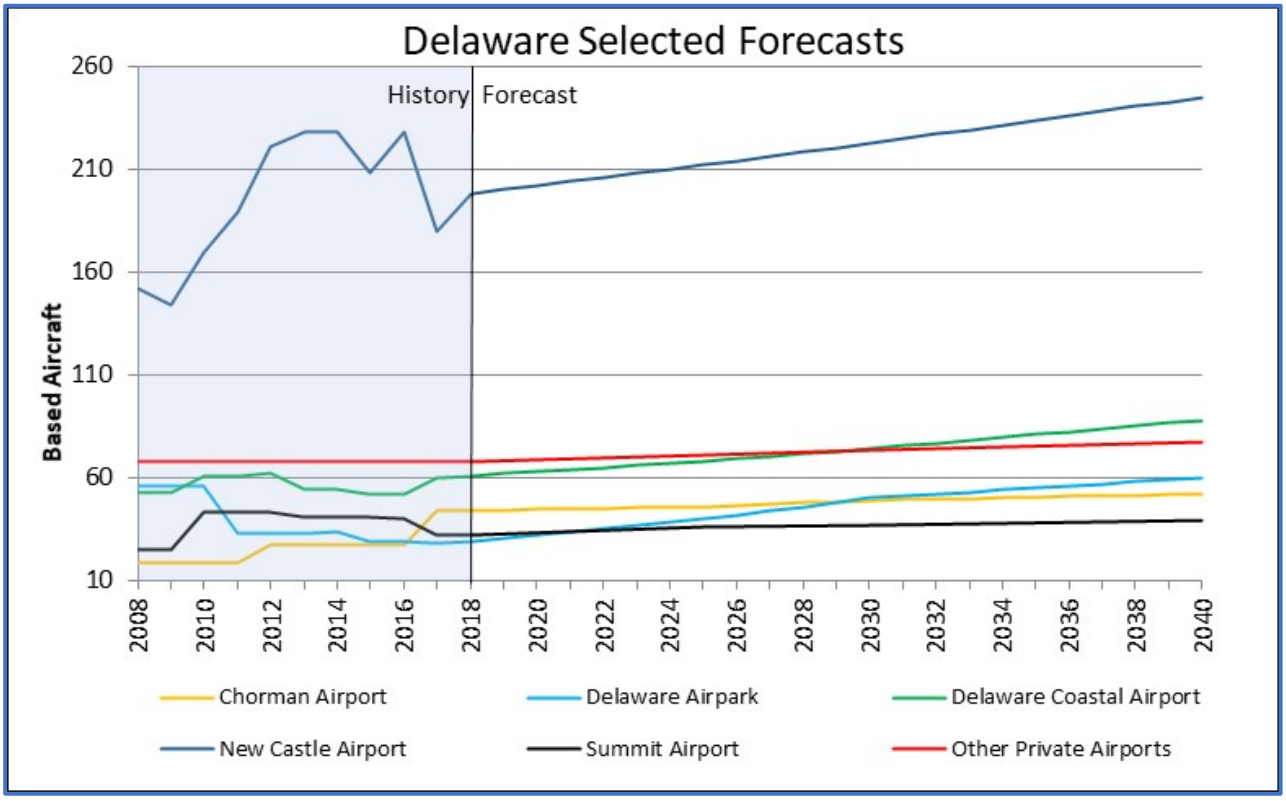


Figure 5-4 - Based Aircraft Forecasts

Airport Capacity

- ***Airfield Capacity:*** The FAA recommends that individual airports should begin planning for additional airfield capacity when actual annual operations reach 60 percent of annual service volume (runway operational capacity over the period of one year). None of Delaware's public-use airports are projected to reach 60 percent of their capacity by 2040.

Only 23 percent of the airfield capacity available at the State's public use airports will be used by the year 2040. None of the large paved airports reach 30 percent during the planning period. Aircraft operational delays at the public-use airports will be negligible.

System Needs

- ***Airfield Improvements:*** Suggested runway extensions or upgrades were made for the following Delaware airports:

  - Chandelle Estates
  - Chorman
  - Delaware Coastal
  - Jenkins
  - Summit Airport

  Other airfield upgrades involved pavement overlays at New Castle Airport and Delaware Airpark.

- ***Landside Improvements:*** These focused mostly upon aircraft storage hangar and apron area improvements at various system airports. Because a number of airports have pending requirements, no statewide totals could be generated. However, seven of the 10 airports show some type of landside development – either in specific facilities or "pending."

2. ALTERNATIVE AVIATION SYSTEM CONCEPTS

AVIATION SYSTEM CONCEPTS IMPLY AN INTERCONNECTED GROUP of airports working in various roles to accomplish system goals. In reality, the interconnectedness of airports in Delaware occurs mainly by default. Many airports have been "grandfathered" into to the current aviation system or network. Roles for airports have not been preassigned. Instead, the local demand for aviation facilities and services has resulted in the current airport roles and network structure.

Given the expanded role of State funding for the public-use airports in Delaware, the systems concept becomes a greater reality, because there is a greater economic ability to shape the airport system through funding priorities. The development of funding priorities focuses on reducing redundancies and promoting system efficiencies. Theoretically, the most important projects will be funded under this systematic approach.

Based upon the forecasts of demand and the system requirements established in the preceding work phases, alternative systems were identified for further evaluation. In general, there are three possible outcomes of a systematic approach. Included among the concepts which could be

considered for development as alternatives are:

1. ***Status Quo Alternative:*** This option is based on an analysis of the adequacy of the existing aviation system with the current number of airports. No investment over and above that already planned is assumed for this alternative. This will allow benchmarking for the other two Alternatives to see how they compare to a do-nothing option.

2. ***Expansion of Existing Aviation System:*** An expansion of the existing aviation system, considering the existing aviation system, plus any new airport or heliport facilities that may be added. This option would consider the potential impacts of new airline service at New Castle Airport, expanded use of the Civil Air Terminal at Dover AFB, funding expansion of privately-owned, public-use airports, and the possible addition of new heliports.

3. ***Contracted Airport System:*** A contracted system of airports that considers potential private airport closures and associated impacts.

System requirements, based on the demand and capacity analyses, were established for the airports included in the proposed alternative systems prior to subjecting them to evaluation. For each alternative, the number of based aircraft and operations were determined for each airport as a part of the identification process (Table 5-1).

Table 5-1 – Demand Allocations to Alternative Systems

Airports	Alternative 1		Alternative 2		Alternative 3	
	Based Aircraft	Operations	Based Aircraft	Operations	Based Aircraft	Operations
Chandelle Estates	26	1,200	26	1,200	N/A	N/A
Chorman	52	18,900	52	18,900	N/A	N/A
Civil Air Terminal	0	1,400	0	1,400	0	1,400
Delaware Airpark	60	48,900	60	48,900	170	71,400
Delaware Coastal	88	49,700	88	49,700	107	59,800
Jenkins	21	600	21	600	N/A	N/A
Laurel	19	10,100	19	10,100	N/A	N/A
New Castle Airport	245	50,300	245	50,300	284	89,300
Smyrna	11	1,800	11	1,800	N/A	N/A
Summit Airport	39	39,000	39	39,000	N/A	N/A
TOTALS	**561**	**221,900**	**561**	**221,900**	**561**	**221,900**

Figure 5-5
Status Quo Alternative

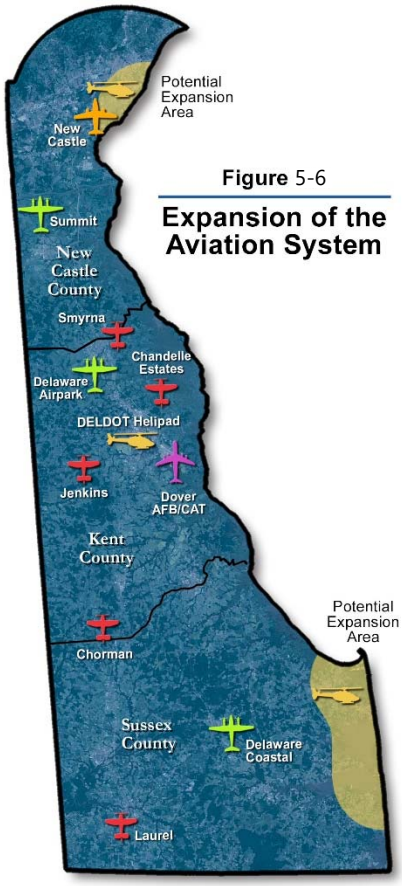


Figure 5-6
Expansion of the Aviation System

Figure 5-7
Contracted Airport System

As shown, Alternative 3 has the greatest demand loadings after absorbing based aircraft and operations from the privately-owned airports.

2.1 STATUS QUO ALTERNATIVE

Alternative 1 is called the "Status Quo" Alternative because it examines the adequacy of the existing system without changes or improvements (see Figure 5-5). The alternative serves as a baseline comparison to each of the "action" alternatives (2 and 3).

The adequacy of the existing system of airports to meet the State's air transportation demands is determined by relating the findings from Phase 1 concerning capacity and facility needs and general locations of airports. In this determination, consideration is given to the estimated aircraft processing capacity of the existing airports (with no expansions), the compatibility of the existing airports with the surrounding community in terms of environmental factors, existing and planned land use and development programs, and the economic viability of the existing airport system with no changes. **Table 5-1** (shown above) presents a summary of the aviation activity associated with the Status Quo Alternative.

2.2 EXPANSION OF EXISTING SYSTEM

Alternative 2 is called the "Expansion of the Aviation System" because it considers new airports and heliports or expanded existing airports as part of the future aviation system. It is actually a synthesis of a number of different actions that would ultimately expand the existing system. Figure 5-6 presents a graphic depiction of Alternative 2 while Table 5-1 (presented earlier) shows the forecast based aircraft and operations associated with each system airport.

Based on the forecasts of air traffic, the Air Force's receptivity toward less restrictive joint use of Dover AFB, the new State funding support for privately-owned, public-use airports, the possible acquisition of development rights at one or more privately owned airports, and the feasibility of new heliports or landing sites in Wilmington and/or coastal areas of Sussex County, an expanded airport system was identified. This system includes all of the existing system airports plus the CAT at Dover AFB and any new public-use heliports to serve the Wilmington metro area or coastal areas of Sussex County.

The planning standards used are those established in Phase I and those established by the Federal Aviation Administration (FAA) with respect to facility requirements needed to accommodate the forecast traffic volumes, giving full consideration to factors such as operational efficiency, safety, environmental concerns, and development costs. Expansion requirements are given in terms of additional land, airfield improvements, building areas, terminal access, and landside facilities.

Because of new State funding mechanisms, the expanded aviation system is able to include privately-owned, public-use airports. In fact, greater emphasis is made on the facility needs of these airports because of the availability of expanded funding.

In this regard, a preliminary analysis of the State aviation system indicates that without any of the privately owned airports, gaps in geographic coverage would exist for western Sussex County and for southern Kent County to a lesser extent. To maintain existing airport service goals, this Alternative examines the potential of preserving one or more airports in geographic coverage voids. This strategy not only helps in the present day with air transportation access, but also with potential future technology which may involve personal air transportation via drones or other similar flight technology.

2.3 CONSTRAINED AIRPORT SYSTEM

Alternative 3 is called the "Contracted Airport System" because it examines the impacts created with the loss of privately owned airports in the State. Under this alternative, 6 of the 10 existing system airports were assumed to close by the year 2040 for various reasons. Alternative 3 focuses on a core system of airports needed to accommodate aviation demand in the State. This

alternative is also considered a "worst case" scenario since it assesses the capability of a contracted system of airports to meet the long-term Delaware aviation needs.

Economic and land development pressures and other unforeseen events have served to close many privately owned airports across the nation. Delaware is not immune from that process. This alternative examines the potential impacts of losing privately owned airports in Delaware including: Chandelle Estates, Chorman, Jenkins, Laurel, Smyrna, and Summit. Even the most viable privately-owned airports could close due to changes in ownership, future downturns in the business cycles, or no succession options for current owners. While this is highly unlikely, the Alternative was designed to measure how well the publicly-owned system of airports could accommodate system demand through the long term future. In fact, the publicly owned airport system is the only sure option of non-closure for the planning period due to grant assurances and other safeguards.

It was assumed that Dover AFB would be available for civil aviation use under this alternative. As such, many of the business jet and multi-engine aircraft operations that take place at the Civil Air Terminal would continue, thereby relieving the need to use other airports for the NASCAR weekends.

Figure 5-7 presents a graphic depiction of Alternative 3 while Table 5-1 (presented earlier) shows the forecast based aircraft and operations associated with each system airport. As shown, there are a number of transfers of based aircraft from the airports that may close to the remaining airports in the system. Most of these transfers were made based upon geographic proximity of existing airports to future airports.

Chapter 6

Evaluation of Alternatives

EVALUATION OF ALTERNATIVES

IDENTIFYING POTENTIAL ALTERNATIVE SOLUTIONS TO DELAWARE'S LONG-TERM aviation needs was the first step toward developing an updated detailed plan of recommended action. That process, completed in Chapter 5, identified three primary alternatives for further review. The second step is to analyze these alternatives, using a number of criteria and evaluating them relative to each other and to the aviation needs of Delaware. This chapter presents a summary of the methods, analysis, and findings of the evaluation process.

Figure 1 – Runway Signage at Delaware Coastal Airport

As an overview, the evaluation of alternatives used a multiple-criteria process to analyze and evaluate the various alternatives. Each criterion was applied to each alternative and scored in a comparative ranking procedure. This approach permitted a direct comparison of alternatives in each area of evaluation. Criteria used in the evaluation process included the following general factors:

- ***Impact of COVID-19 on Airport Alternatives:*** Are there differences in the ability of each alternative to effectively deal with the COVID-19 virus and its aftermath? The aviation industry has been hard hit by restrictions on travel. This criterion will examine the relative differences between alternatives with respect to these impacts.
- ***Potential Impacts of Private Airports Closing:*** Alternative 3 will deal with this issue directly. However, three impacts that can be measured across all alternatives include:
  - ***Increased Surface Access Times:*** This measure involves the overall access times to system airports using surface access vehicles.
  - ***Environmental Impact Differences***: It is possible that with fewer airports, environmental impacts may be greater, in terms of aircraft noise and the size of airport development footprint.
  - ***Capital Cost Differences:*** It is possible that without private airports, capital expenditures will increase at the remaining publicly owned, public-use airports.
- ***Impacts of Greater Funding of Privately Owned, Public-Use Airports:*** The availability of more State funding for privately owned, public-use airports may impact the system in ways not considered by previous studies. This includes funding methods and grant assurances needed to keep these airports open for the long term.
- ***Cost-Effectiveness:*** The cost of each alternative will be estimated in order to determine which is the most cost-effective. These costs must be weighed against the benefits provided by each alternative.

- ***Impact of Contingencies:*** Because there are a number of airport and heliport development contingencies, this evaluation criterion will analyze each alternative's ability to accommodate these contingencies. Contingencies include the potential expansion of Delaware Airpark to accommodate larger business jet activity, the economic benefit of more public-use heliports in demand areas, and the impacts of technology on the alternative aviation systems.

A composite ranking of the alternatives was prepared based upon all criteria and using a matrix format to array information. As a result of this approach, the original alternatives were narrowed to those attributes in each alternative that have the most potential for success.

1. IMPACT OF COVID-19 ON AIRPORT ALTERNATIVES

EARLY IN 2020, THE COVID-19, ALSO KNOWN as the Corona Virus, has impacted the demand for aviation services worldwide. Elimination of international and cutbacks for domestic flights has reduced demand for air travel and if this continues for an extended period, it will significantly hurt the aviation industry. Already, the virus has impacted New Castle Airport by delaying the launch of Frontier service and the start-up airline, Xtra.

Figure 2 – Sign at Chandelle Estates Airport

For the Delaware Aviation System Plan, the following assumptions regarding impacts of COVID-19 have been made:

- ***Factors Affecting Demand:*** Social distancing, mandatory 14-day quarantines, and stay-at-home orders will, in the short run, diminish general aviation and airline demand significantly. When these restrictions are in place, demand for most other services are curtailed, which in turn, impacts the demand for air transportation services.
- ***Disruption Period:*** The length of duration of the economic "lock down" will be determined by how quickly medical treatments can be implemented. In addition, there may be some medical test developed which signifies an immunity to the virus. Such a test would allow those with immunity to reenter the workforce. It is assumed that the longest period of shut down will be one year.
- ***Economic Restart:*** It is likely that the economy will be restarted in stages prior to the one-year timeframe. Some essential businesses have not closed such as food stores, medical facilities, etc. Other businesses such as sports venues, restaurants, and other retailers will come back online as protocols are developed. These protocols may involve giving more

freedom to those at low risk, versus high risk population segments (elderly, immunocompromised).

- ***Recovery Time Period:*** Return to demand levels of 2019 will take some time. It is assumed that it will take at least a full year (all of 2021) to recover to 2019 aviation activity levels. Thus, 2022 will be the first year to equal or surpass 2019 fuel sales and other aviation activity levels.

Any of these assumptions could be proven wrong by actual events. However, for planning purposes, these assumptions will govern projections for aviation demand and revenue and expense generating purposes.

1.1 PROBABLE IMPACTS ON THE DELAWARE AVIATION SYSTEM

Impacts to Delaware's public-use airport system will vary, depending upon the length of time the economy is shut down. A short shut down period would be followed by a fairly quick rebound. However, the longer it goes, the more difficult and time consuming will be the rebound. Our current assumption is that the rebound will require all of 2021 to reach 2019 levels of demand. Therefore, the assumption as to how deep will be the cuts in demand are not as important as are the assumptions about the length of time for recovery.

Figure 3 – New Castle Airport Entrance

Because the airline industry has been hit harder than general aviation, it may take longer to rebound. This would impact New Castle Airport the greatest. By delaying the launch of Frontier Airline service and the startup of Xtra Airlines, increases in jet fuel sales will have to wait. If air travel protocols change permanently, where social distancing on the airplane is required, the load factors will plummet and create financial feasibility issues for the airlines. If they have to raise prices to cover costs, that in turn, can further dampen demand. This scenario casts a shadow over the potential airline service to New Castle Airport.

General aviation has been hit by the reduction in corporate aviation usage, due to the temporary closure of many businesses. In addition, the imposition of 14-day quarantines in some states or communities has curtailed day-flights or overnight flights to business locations. Small, personal general aviation has undergone reductions by virtue of stay-at-home orders and a reduction in disposable income.

A total loss of $23.3 billion is anticipated at commercial airports in the U.S. in 2020 according to Airports Council International.[1] The report does not give an estimate for general aviation airports, but it can be assumed that losses will occur due to the reduced level of travel. The news cycle has reported predicted losses for 2020 for airlines starting with February 2020 estimates of $28 billion expanding to $113 billion by early March. That number will certainly increase, the longer the pandemic lasts.

1.2 IMPACTS ON ALTERNATIVES

The question as to whether the pandemic will impact each alternative equally or unequally is the subject of this portion of the analysis. Factors to consider include:

- Reduced Aviation Demand
- Reduced Revenues
- Reduced Capital Spending

Reduced Aviation Demand

The short-term reduction in aviation demand will likely impact each alternative equally. If it takes two to five years to rebound to 2019 levels, it can be assumed that forecasts can be pushed back two to five years. Because the system plan takes a 20-year view, much of the near-term disruption in demand will have been sorted out by the intermediate or long-term planning periods. However, in the near term, the following impacts may be experienced:

- ***Alternative 1:*** The Status Quo option will simply see a slowdown in overall aviation activity. Because no significant capital improvements are planned, it is likely to show less of an impact than for the Expansion alternative or the Publicly Owned Airports option.
- ***Alternative 2:*** This option examines the expansion and investment in the public-use airport system. With lower demand, the need for expansion is diminished. In addition, the need for heliport facilities would not materialize as quickly.
- ***Alternative 3:*** This option assumes all privately owned airports would close. Depending upon how deep a recession goes, this option could be fulfilled, in part, much more quickly than the other options. That is, some privately owned airports may be forced to close because of the lack of demand and associated revenues.

The reduction in demand has created a pilot surplus, where there was once a projected 10-year pilot deficit. This may impact the demand for flight training at Delaware Airpark through the Delaware State University (DSU) Flight Training program. It would also impact the forecast of

[1] Source: "Economic Impact of Coronavirus on U.S. Commercial Airports," Airports Council International, April 29, 2020. https://airportscouncil.org/wp-content/uploads/2020/03/Economic-Impact-of-Coronavirus-on-U.S.-Commercial-Airports.pdf.

based aircraft, where much of the growth was assigned to DSU's purchase of additional aircraft over the planning period. This impact would be felt equally in all of the alternatives.

Figure 4 – DSU Training Aircraft

Reduced Revenues

Reduced revenues will impact all of the alternatives with slightly different results. The generalization is that publicly owned airports can better weather revenue droughts than can privately owned airports, because of their access to general fund revenues. As such, impacts to the alternatives have been estimated to be:

- ***Alternative 1:*** The Status Quo option with less revenues will not be impacted as greatly as will the Alternatives that require investment and capital debt service. It is assumed that little or no investment will be made (over and above that already planned) for this option. Lower revenue streams will have less impact on a do-nothing option than for construction options.
- ***Alternative 2:*** This option examines the expansion and investment in the public-use airport system. With lower revenue streams, the ability to fund expansion is diminished. This may create obligations that cannot be funded in the timeframes anticipated.
- ***Alternative 3:*** With reduced revenues, privately owned airports would probably close more quickly than would be the case with uninterrupted revenue streams. The publicly owned airport system would benefit somewhat from the demand coming from the closed private airports, thereby offsetting some of the decline in revenues. However, the increased demand may not be enough to pay for the local share of capital improvements.

Reduced Capital Spending

Reduced capital spending would naturally occur at the privately owned airports. However, in some cases the federal government has shown a desire to provide stimulus spending for infrastructure projects. For the COVID-19 pandemic, the FAA has authorized an additional $10 billion in airport spending, some of which can be used for capital projects. Of course, the NPIAS airports will fare better than the private airports because of their access to these funds. State funding of capital projects at private airports will help offset some of these imbalances.

- ***Alternative 1:*** The Status Quo option is, by definition, the no or low capital spending option. Therefore, reduced capital spending will be measured more in the lack of needed facilities than in financial terms. It is assumed little or no investment will be made (over and above that already planned) for this option.

- ***Alternative 2:*** This option examines the expansion and investment in the public-use airport system. With lower capital spending generated by demand, it may be that the assistance of the State, using its fuel flowage fee revenue, will offset some of the needed capital funding at the privately-owned airports. This is not an option for Alternative 1.
- ***Alternative 3:*** The reduction in capital spending generated from airport revenue is less likely to impact the publicly owned airports than the privately owned facilities. The publicly owned airports have access to FAA funding, as well as State of Delaware matching funds. This Alternative is likely to fare better than the other two with regard to reduced capital spending.

Although the reduction in demand, revenues, and capital spending are presented separately, their impacts are all intertwined. An economic recession causes reductions in each of these factors through a complex but interrelated process. Scoring of each Alternative for COVID-19 impacts is presented later in **Table 6-14**.

2. POTENTIAL IMPACTS OF PRIVATE AIRPORTS CLOSING

THE CLOSURE OF PRIVATE AIRPORTS IS THE basis for Alternative 3 formulation. Evaluation of impacts stemming from this potential occurrence can be measured across all alternatives include using at least four criteria:

Figure 5 – Old Skydiving Facility at Laurel Airport

- ***Increased Surface Access Times:*** This measure involves the overall access times to system airports using surface access vehicles.
- ***Facility Needs:*** The impacts of facilities needed for each alternative differ, based upon the number of airports included in each one.
- ***Environmental Impact Differences***: It is possible that with fewer airports, environmental impacts may be greater, in terms of aircraft noise and the size of airport development footprint.
- ***Capital Cost Differences:*** It is possible that without private airports, capital expenditures will increase at the remaining publicly owned, public-use airports.

2.1 INCREASED SURFACE ACCESS TIME

With fewer airports, there is greater time needed to access them. One way to measure the relative differences between alternatives is to examine the 30-minute driving time service areas around each airport and quantify the overlap in areas. Figure 6-6 shows the 30-minute driving times

surrounding each airport for the three alternatives (Alternatives 1 and 2 share the same number of airports and are thus combined).

The reasoning behind rating each of these alternatives is that the more overlap of driving times that is available, the greater the potential convenience to airport users. By 2040, 30 percent of all based aircraft (168 out of 561) are forecast to be located at private airports. With reallocation of these 168 aircraft in Alternative 3, it may be that some aircraft owners are closer to their residences with the new airport location. However, chances are better that there are more inconveniences with fewer airports.

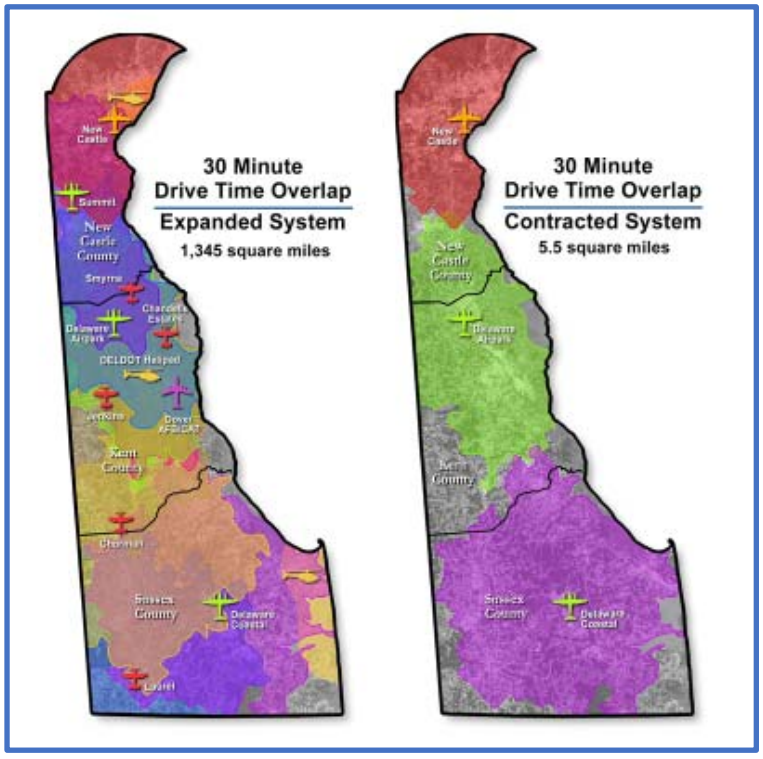


Figure 6-6 – Drive Time Overlaps

	Square Miles
▶ Alternative 1 Driving Time Overlap Area:	1,345
▶ Alternative 2 Driving Time Overlap Area:	1,345
▶ Alternative 3 Driving Time Overlap Area:	6

If heliport landing facilities are developed in Alternative 2, it will rank slightly better than Alternative 1 because there are more aviation facilities to choose from. Alternative 3 ranks last because there is no overlap in airport service areas.

2.2 FACILITY NEEDS

In Chapter 4 of the Phase I study, a demand/capacity and facility needs analysis was performed for the existing system of airports. When loaded with forecast demand, the needed facilities were identified and quantified for each airport. Chapter 5 identified three primary alternatives for further review and analysis. Alternative 1 is called the "Status Quo" Alternative because it examines the adequacy of the existing system where no changes other than those already planned are included. The Alternative serves as a baseline comparison to each of the "action" Alternatives (2 and 3). Alternative 1 has the following assumptions:

- No changes are made to the existing GA system assets in terms of capacity.

- The Civil Air Terminal's GA capacity stays at 13,500 operations.
- Delaware Coastal Airport will expand its primary runway to 6,000 feet.

Figure 6-7 – T-Hangars at Delaware Airpark

Alternative 2 is called the "Expansion of the Aviation System" because it considers new airports and heliports or expanded existing airports as part of the future aviation system. Assumptions used in Alternative 2 included the following:

- Delaware Coastal Airport will expand its primary runway to 6,000 feet.
- The Civil Air Terminal's GA capacity increases from 13,500 operations to 25,000 operations.
- Chorman Airport will widen its runway to 60 feet and construct a full parallel taxiway.
- New Castle Airport will have airline service in the near future (within 5 years).
- Chandelle Estates Airport will reconstruct its runway and widen it to 60 feet.
- Option of Delaware Airpark lengthening runway to 5,500 feet.
- Summit Airport will expand its runway to 5,000 feet.

Alternative 3 is called the "Contracted Airport System" because it examines the impacts created with the loss of privately owned airports in the State. It was assumed that Dover AFB would be available for civil aviation use under this alternative. As such, many of the business jet and multi-engine aircraft operations that take place at the Civil Air Terminal would continue, thereby relieving the need to use other airports for the NASCAR weekends.

- Delaware Coastal Airport will expand its primary runway to 6,000 feet.
- The Civil Air Terminal's GA capacity increases from 13,500 operations to 24,000 operations.
- Chandelle Estates, Chorman, Jenkins, Laurel, Smyrna, and Summit are assumed to close by 2040 for various reasons.
- Delaware Coastal absorbs Laurel Airport's demand and 51 percent (rounding) of aircraft and operations from Chorman.
- Delaware Airpark absorbs the demand from Chandelle Estates, Jenkins, Smyrna, and 49 percent of Chroman's aircraft and operations.

Airfield Demand/Capacity

The airfield demand/capacity capabilities for each of the airports by alternative are shown in **Table 6-1**. As shown, the only difference between Alternative 1 and 2 involves the potential increase in civilian aircraft operational capacity at the Civil Air Terminal at Dover AFB (13,500 vs. 25,000). For Alternative 3, the reduced number of airports and airfield capacity resulting from private airport

closures increases the percent of capacity used from 23 percent to 37 percent. This is still well below 60 percent and the need to add additional airfield capacity.

Table 6-1 - Airfield Demand/Capacity Comparisons

Alternative/Airport	Annual Service Volume	Year 2040 Demand	Percent of Capacity	Annual Delay (Hours)
Alternative 1				
Chandelle Estates Airport	48,400	1,200	2%	0
Chorman Airport	54,200	15,900	29%	51
Civil Air Terminal, Dover AFB	13,500	1,400	10%	0
Delaware Airpark	198,700	48,900	25%	119
Delaware Coastal Airport	174,500	49,700	28%	153
Jenkins Airport	24,300	600	2%	0
Laurel Airport	33,400	10,100	30%	34
New Castle Airport	194,000	50,300	26%	134
Smyrna Airport	29,800	1,800	6%	0
Summit Airport	173,100	39,000	23%	81
DELDOT Helistop	5,000	50	1%	0
Total for Alt. 1	**948,900**	**218,950**	**23%**	**572**
Alternative 2				
Chandelle Estates Airport	48,400	1,200	2%	0
Chorman Airport	54,200	15,900	29%	51
Civil Air Terminal, Dover AFB	25,000	1,400	6%	0
Delaware Airpark	198,700	48,900	25%	119
Delaware Coastal Airport	174,500	49,700	28%	153
Jenkins Airport	24,300	600	2%	0
Laurel Airport	33,400	10,100	30%	34
New Castle Airport	194,000	50,300	26%	134
Smyrna Airport	29,800	1,800	6%	0
Summit Airport	173,100	39,000	23%	81
DelDOT Helistop	5,000	50	1%	0
Total for Alt. 2	**960,400**	**218,950**	**23%**	**572**
Alternative 3				
Civil Air Terminal, Dover AFB	25,000	1,400	6%	0
Delaware Airpark	198,700	60,450	30%	206
Delaware Coastal Airport	174,500	67,750	39%	325
New Castle Airport	194,000	89,300	46%	536
DelDOT Helistop	5,000	50	1%	0
ALT 3 Total	**597,200**	**218,950**	**37%**	**1,067**

Table 6-2 presents a summary of the differences in airfield capacity shown in **Table 6-1**. Not factored into this analysis is the potential initiation of new airline service at New Castle Airport. However, even if 20 airline operations per day were added, it would still keep the utilization percentage of capacity just below 50 percent. This option is addressed in a later section, Impact of Contingencies.

Table 6-2 - Airfield Demand/Capacity Comparisons, by Alternative

	Alternative 1	Alternative 2	Alternative 3
Based Aircraft	561	561	561
2040 Demand	218,950	218,950	218,950
Annual Service Volume	948,900	960,400	597,200
Percent of Capacity	23.1%	22.8%	36.7%
Annual Delay (Hours)	572	572	1,067
Surplus Capacity	729,950	741,450	378,250
Percent of Available Capacity	76.9%	77.2%	63.3%

Table 6-3 shows the proposed runway improvements to system airports by the year 2040, while **Table 6-4** shows the proposed additional airside facilities for the same time period.

Table 6-3 – Runway/Taxiway Improvements to System Airports: Year 2040

Alternative/Airport	Existing Primary Runway Dimensions	Future Primary Runway Dimensions	Dimensional Upgrade[1,2]
Alternative 1			
Chandelle Estates Airport	2,533' x 28'	2,533' x 28'	None
Chorman Airport	3,588' x 50'	3,588' x 50'	None
Civil Air Terminal, Dover AFB	12,903' x 150'	12,903' x 150'	None
Delaware Airpark	4,201' x 75'	4,201' x 75'	None
Delaware Coastal Airport	5,500' x 150'	6,000' x 150'	500' Runway and Taxiway Extension
Jenkins Airport	2,035' x 70'	2,035' x 70'	None
Laurel Airport	3,175' x 270'	3,175' x 270'	None
New Castle Airport	7,275' x 150'	7,275' x 150'	None
Smyrna Airport	2,600' x 125'	2,600' x 125'	None
Summit Airport	4,488' x 65'	4,488' x 65'	None
DELDOT Helistop	60' x 60'	60' x 60'	None
Turf Subtotal	*147,189*	*147,189*	*0*
Pavement Subtotal	*523,602*	*531,935*	*12,778*
Total for Alt. 1	***670,791***	***679,124***	***12,778***
Alternative 2			

Table 6-3 – Runway/Taxiway Improvements to System Airports: Year 2040			
Alternative/Airport	**Existing Primary Runway Dimensions**	**Future Primary Runway Dimensions**	**Dimensional Upgrade[1,2]**
Chandelle Estates Airport	2,533' x 28'	2,533' x 60'	32' in Width and Full Reconstruction of Existing Runway
Chorman Airport	3,588' x 50'	3,588' x 60'	10' in Width and Full Parallel Taxiway
Civil Air Terminal, Dover AFB	12,903' x 150'	12,903' x 150'	N/A
Delaware Airpark	4,201' x 75'	4,201' x 75'	None
Delaware Coastal Airport	5,500' x 150'	6,000' x 150'	500' Runway and Taxiway Extension
Jenkins Airport	2,035' x 70'	2,035' x 70'	None
Laurel Airport	3,175' x 270'	3,175' x 270'	None
New Castle Airport	7,275' x 150'	7,275' x 150'	None
Smyrna Airport	2,600' x 125'	2,600' x 125'	None
Summit Airport	4,488' x 65'	5,000' x 65'	512' Runway and Taxiway Extension
DelDOT Helistop	60' x 60'	60' x 60'	None
Turf Subtotal	*147,189*	*147,189*	*0*
Pavement Subtotal	*523,602*	*548,626*	*49,793*
Total for Alt. 2	**670,791**	***695,815***	**49,793**
Alternative 3			
Civil Air Terminal, Dover AFB	12,903' x 150'	12,903' x 150'	None
Delaware Airpark	4,201' x 75'	4,201' x 75'	
Delaware Coastal Airport	5,500' x 150'	6,000' x 150'	500' Runway and Taxiway Extension
New Castle Airport	7,275' x 150'	7,275' x 150'	None
DelDOT Helistop	60' x 60'	60' x 60'	None
Total for Alt. 3	**463,375**	**471,708**	**12,778**

[1]New taxiway pavements are included in pavement subtotals.
[2]Reconstruction of Chandelle Estate's runway is included as a dimensional upgrade in Alternative 2.

Table 6-4 - Additional Airside Facilities, by Alternative*						
Alternative/Airport	**Runway (S.Y.)**	**Taxiway (S.Y.)**	**Runway Lighting (L.F.)**	**Taxiway Lighting (L.F.)**	**PAPI**	**REIL**
Alternative 1						
Chandelle Estates Airport	0	0	0	0	2 PAPI	0
Chorman Airport	0	0	3,588' MIRL	0	2 PAPI	0
Civil Air Terminal, Dover AFB	0	0	0	0	0	0
Delaware Airpark	0	0	0	0	0	0

Table 6-4 - Additional Airside Facilities, by Alternative*						
Alternative/Airport	**Runway (S.Y.)**	**Taxiway (S.Y.)**	**Runway Lighting (L.F.)**	**Taxiway Lighting (L.F.)**	**PAPI**	**REIL**
Delaware Coastal Airport	8,333	4,444	500' MIRL	800' MITL	0	0
Jenkins Airport	0	0	0	0	0	0
Laurel Airport	0	0	0	0	0	1 REIL
New Castle Airport	0	0	0	0	0	0
Smyrna Airport	0	0	0	0	0	0
Summit Airport	0	0	0	0	0	0
DELDOT Helistop	0	0	0	0	0	0
Total for Alt. 1	**8,333**	**4,444**	**4,088**	**800**	**4**	**1**
Alternative 2						
Chandelle Estates Airport	16,887	0	0	0	2 PAPI	0
Chorman Airport	3,987	10,863	3,588' MIRL	3,911' MITL	2 PAPI	0
Civil Air Terminal, Dover AFB	0	0	0	0	0	0
Delaware Airpark	0	0	0	0	0	0
Delaware Coastal Airport	8,333	4,444	500' MIRL	800' MITL	0	0
Jenkins Airport	0	0	0	0	0	0
Laurel Airport	0	0	0	0	0	1 REIL
New Castle Airport	0	0	0	0	0	0
Smyrna Airport	0	0	0	0	0	0
Summit Airport	3,698	1,582	512' MIRL	570' MITL	0	0
DELDOT Helistop	0	0	0	0	0	0
Total for Alt. 2	**32,904**	**16,889**	**4,600**	**5,280**	**4**	**1**
Alternative 3						
Civil Air Terminal, Dover AFB	0	0	0	0	0	0
Delaware Airpark	0	0	0	0	0	0
Delaware Coastal Airport	8,333	4,444	500' MIRL	800' MITL	0	0
New Castle Airport	0	0	0	0	0	0
DELDOT Helistop	0	0	0	0	0	0
Total for Alt. 3	**8,333**	**4,444**	**500**	**800**	**0**	**0**

Table 6-5 presents a summary of airside alternative differences for the various facilities. Not shown, but also included in the costs will be the overlay of the primary runway and taxiway pavements at publicly owned Airports (assumes 20-year life).

Table 6-5 – Summary of Additional Airside Alternative Differences			
Airside Facilities	**Alternative 1**	**Alternative 2**	**Alternative 3**
Runway (paving) SY	8,333	32,904	8,333
Taxiway (paving) SY	4,444	16,889	4,444
Runway Lighting (LF)	4,088	4,600	500
Taxiway Lighting (LF)	800	5,280	800
PAPI	4	4	0
REIL	1	1	0

Landside Facility Needs

Deficiencies in landside capacity would be remedied in each alternative by the conceptual addition of apron area, T-hangars, conventional hangars, terminal building space, and automobile parking space. **Table 6-6** presents the additional landside facilities needed for each alternative.

Table 6-6 – Additional Landside Facilities					
Alternative/Airport	**Apron Area (SY)**	**T-Hangars (Units)**	**Conventional Hangar Space (SF)**	**Terminal Building Space (SF)**	**Auto Parking (SY)**
Alternative 1					
Chandelle Estates Airport	(1,450)	(2)	0	0	0
Chorman Airport	0	(5)	(3,200)	0	0
Civil Air Terminal, Dover AFB	0	0	0	(1,500)	(1,190)
Delaware Airpark	0	(23)	(3,200)	0	(315)
Delaware Coastal Airport	0	(12)	(36,800)	0	0
Jenkins Airport	0	0	0	(500)	0
Laurel Airport	0	0	0	0	0
New Castle Airport	0	0	(110,600)	0	0
Smyrna Airport	0	(1)	0	0	0
Summit Airport	0	0	0	0	0
DELDOT Helistop	0	0	0	0	0
Total for Alt. 1	**(1,450)**	**(43)**	**(153,800)**	**(2,000)**	**(1,505)**
Alternative 2					
Chandelle Estates Airport	1,450	2	0	0	0
Chorman Airport	0	5	3,200	0	0
Civil Air Terminal, Dover AFB	0	0	0	1,500	1,190

Table 6-6 – Additional Landside Facilities					
Alternative/Airport	**Apron Area (SY)**	**T-Hangars (Units)**	**Conventional Hangar Space (SF)**	**Terminal Building Space (SF)**	**Auto Parking (SY)**
Delaware Airpark	0	23	3,200	0	315
Delaware Coastal Airport	0	12	36,800	0	0
Jenkins Airport	0	0	0	500	0
Laurel Airport	0	0	0	0	0
New Castle Airport	0	0	110,600	0	0
Smyrna Airport	0	1	0	0	0
Summit Airport	0	0	0	0	0
DELDOT Helistop	0	0	0	0	0
Total for Alt. 2	**1,450**	**43**	**153,800**	**2,000**	**1,505**
Alternative 3					
Civil Air Terminal, Dover AFB	0	0	0	1,500	1,190
Delaware Airpark	0	102	8,000	0	1,400
Delaware Coastal Airport	344	31	43,200	0	0
New Castle Airport	5,611	0	147,800	0	0
DELDOT Helistop	0	0	0	0	0
Total for Alt. 3	**5,955**	**133**	**199,000**	**1,500**	**2,590**

Table 6-7 presents a summary of the additional landside facilities needed, by alternative.

Table 6-7 – Summary of Additional Landside Facilities, by Alternative			
	Alternative 1	**Alternative 2**	**Alternative 3**
Apron Area (SY)	(1,450)	1,450	5,955
T-Hangar (Units)	(43)	43	133
Conventional Hangar Space (SF)	(153,800)	153,800	199,000
Terminal Building Space (SF)	(2,000)	2,000	1,500
Auto Parking (SY)	(1,505)	1,505	2,590

As shown, Alternative 3 has the largest requirements because of the need to replace some private airport hangar facilities within the publicly owned system.

2.3 ENVIRONMENTAL CONSEQUENCES

A method was developed to evaluate some of the environmental consequences of concentrating much of the State's aviation activity at three airports. The most noticeable is noise impact on adjacent residential properties. The second environmental consequence involves the level of airport infrastructure development at the three publicly owned NPIAS airports needed to accommodate more aircraft in Alternative 3.

Potential Noise Impact

Although no noise modeling was used in the development of this evaluation, an intuitive approach was employed. This approach assumes that the more aircraft operations that occur at an airport, the greater the noise footprint, even if the critical 65 Day-Night Average Sound Level (DNL) contour stays on the airport. Also, the average sound level may be within acceptable critical boundaries, while individual noise events still bother residents. The more aircraft operations, the more chances of disturbing people who live nearby.

From the Analysis of Existing System (Chapter 2) of Phase 1, aerial photos of each airport were gathered, and recent development was noted. Those photos were grouped by public/private ownership an analyzed for residential density adjacent to airport property. Using the based aircraft allocation model from the Identification of Alternatives, those airports losing aircraft (private airports) were compared to the airports gaining aircraft (publicly owned airports) to see if the residential overflight would be better or worse. Better, in this case, is fewer homes/less dense residential development. Worse, would be more homes and residential property.

From the allocation model, the following based aircraft transfers were assumed:

▶ New Castle Airport	39 Aircraft	From: Summit Airport
▶ Delaware Coastal Airport	46 Aircraft	From: Laurel Airport and Chorman
▶ Delaware Airpark	86 Aircraft	From: Chandelle Estates, Chorman, Jenkins, and Smyrna

Figures 6-8 – 6-10 show the grouping the aerials using the above pairings.

Figure 6-8
New Castle Airport and Summit Airport

Figure 6-9 Delaware Coastal Airport and Adjacent Airports

Figure 6-10 Delaware Airpark and Adjacent Airports

Analyses of the aerial photos reveal the following:

- ***New Castle Airport:*** Although Summit Airport has some residential development around it, the residential development around New Castle Airport is significantly denser and larger. The increased aircraft activity will impact more homes than would be the case if Summit remained open.
- ***Delaware Coastal Airport:*** Laurel and Chorman have no significant residential development in close proximity, while Delaware Coastal has residential housing, parks, and a school nearby. The increased aircraft activity will impact more homes and noise sensitive areas than would be the case if Laurel and Chorman remained open.
- ***Delaware Airpark:*** There is residential development off the east end of the runway and to the south and southwest at Delaware Airpark. Three of the four private airports with 83 transferring aircraft are strictly rural in nature: Chorman, Jenkins, and Chandelle Estates. Smyrna, with 11 transferring aircraft does have residential development off the west end. Even so, the noise impacts will be greater to the residential areas around Delaware Airpark than the collective impacts at the other four private airports.

In all cases, more residential housing will be impacted by potential aircraft noise through the closures of privately owned airports. While Summit Airport and Smyrna Airport have some residential housing nearby, the airports to which they are transferring have more and denser residential developments.

3. GREATER FUNDING OF PRIVATELY OWNED AIRPORTS

WHEN CONSIDERING THE IMPACTS OF GREATER FUNDING of privately owned, public-use airports, only Alternative 2 qualifies for analysis. Alternative 1 is essentially a do-nothing option, while Alternative 3 has no private airports included. Thus, the benefits of using greater funding for private airports has to be measured against such factors as travel convenience (more facilities), economic development/jobs, and the ability to keep more airports open and serviceable to the public.

3.1 PROBABLE IMPACTS

The first step in this evaluation is to define the probable impacts to Alternative 2 of greater State funding of the privately owned airports. In this regard, there are several assumed impacts:

- More facilities available at each airport.
- Greater safety margins because of projects such as runway repair, obstacle removal, better lighting, marking, etc.
- DelDOT review and input for projects.

- More economic development potential and jobs because of more possible locations for aviation businesses.
- Improvement of the lifespan of private airports because of outside funding of some fixed costs. In addition, grant assurances will provide some incentive to remain open as an airport.

Figure 6-11 – Summit Airport

These potential impacts, when applied in a systematic manner, help to quantify the overall benefits of increased State funding for the private airport system relative to other options.

3.2 ALTERNATIVE COMPARISONS

When using the probable impacts to compare Alternative 2 with Alternatives 1 and 3, several differences emerge. Some of these are qualitative and some are quantitative. **Table 6-8** presents a summary of the comparative process.

Table 6-8 – Impacts of Greater State Funding for Private Airports

Benefit	Alternative 1	Alternative 2	Alternative 3
More Facilities	3 (Existing and in Progress Only)	5 (Most Airports and Facilities)	3 (Fewer Airports)
Safety Margins	1 (No Improvements)	4 (Many Improvements)	5 (All Improvements)
DelDOT Review	1 (No Program)	5 (Review All Airports)	3 (Moderate Input - Matching Funds Only)
Economic Development	2 (Current System Maintained)	5 (Maximum Potential - All Airports)	4 (Missing Private Airport Contribution)
Airport Lifespan	1 (No Guarantees for Private Airports)	4 (Improved Lifespan Potential)	5 (No Airport Closures)
Total Points	**8**	**23**	**20**

The table shows the specific benefit and how each alternative ranks, relative to that benefit. For example, the benefit of More Facilities is experienced to the greatest degree by Alternative 2. Safety Margin improvements would occur for both Alternative 2 and 3. However Alternative 3 will always have better safety margins because of FAA mandates for such things as taxiway separations from runways, clear approaches, and pavement maintenance. While improvements will occur in Alternative 2 with State investment in the private airport system, there will be structural issues that cannot be corrected without massive sums of money (e.g. taxiway separations from runways at Chorman and Summit).

With regard to DelDOT Review, Alternative 1 scores lowest because there is no program to review. Alternative 2 scores highest because the review process for proposed projects covers all private,

public-use airports, along with the matching grants for the NPIAS airports. Alternative 3 scores in the mid-range because DelDOT does have some input, but only matching funds for projects already selected by publicly owned airport sponsors.

For Economic Development, Alternative 1 scores in the mid-range, simply because all of the airports are assumed to remain open. These facilities support jobs and wages. Alternative 2 scores highest, because not only are all airports open, but they have funding to take advantage of new opportunities, which in turn, could lead to more jobs. Alternative 3 also score in the mid-range because job support is not as great with fewer airports. Redundant operations, such as FBOs and maintenance operators are assumed to be consolidated in Alternative 3, relative to Alternative 2.

Finally, Airport Lifespan shows that Alternative 1 has no guarantee of private airport survival because of a lack of funding. Alternative 2 scores high because of the ability of DelDOT to fund needed projects and to require grant assurances that the airports remain open. This is still not a failsafe program if an airport operator is in bankruptcy. Alternative 3 scores highest because all three publicly owned airports will remain open by virtue of their grant assurances and governmental pledges.

When all scores are totaled, Alternative 2 ranks highest with 23 points, Alternative 3 is second with 20 points, and Alternative 1 is a distant third with 8 points. The upshot is that State funding of private airport projects is an overall benefit, relative to other options.

4. COST EFFECTIVENESS OF ALTERNATIVES

THE COST OF EACH ALTERNATIVE WAS ESTIMATED in order to determine which is the most cost-effective. These costs must be weighed against the benefits provided by each alternative. Costs were determined by multiplying unit costs by the specific number of facility units forecast for the future at each airport for each Alternative. For the Alternatives Analysis, the numbers were aggregated into Airside and Landside costs for each airport, by alternative. In a following chapter, the Recommended Plan will provide detail on the costs by facility for airports included in the preferred aviation system.

Table 6-9 presents a summary of the costs associated with the airports, by Alternative. **Table 6-10** presents a breakdown of these costs by airport for each Alternative. Alternative 1, Status Quo Alternative, shows negative cost numbers, which reflect a deficiency of facility development. The positive numbers in Alternative 1 reflect planned development that is already "on the books" so to speak. Alternatives 2 and 3 show costs of $31.6 million and $39.7 million, respectively.

Table 6-9 – Total Costs by Alternative			
Development Item	**Alternative 1**	**Alternative 2**	**Alternative 3**
Landside	($24,688,100)	$24,688,100	$38,093,848
Airside	$2,432,560	$6,945,600	$1,573,000
Total Costs	**($22,255,540)**	**$31,633,700**	**$39,666,848**

4.1 COST METRICS

The total cost of an Alternative may not be the best measure of cost-effectiveness. That is, a less expensive Alternative may not provide adequate services (Alternative 1 for example). There are other factors that enter the equation, such as average cost per airport, convenience, and economic impact. These can be described as follows:

Average Cost Per Airport: This metric includes the number of airports within a system as a part of the measure. The lower the cost per airport, the better the potential financial efficiencies. Even though an alternative could cost more in total, it could still score highest in this metric. Technically, Alternative 1 does not compete in this category because the negative cost numbers indicate a failure to meet facility needs.

Convenience: For this measure, the surface access time, combined with the average cost per airport is used. Technically, the lowest cost per unit of time (or its surrogate) for access would score the highest in this metric.

Economic Impact: Using an older report from 2018, the economic impact of each airport, divided by its improvement costs provide a metric that considers the output generated by each system airport. The highest economic impact dollar per capital improvement dollar ratio would score the highest in this metric.

Total System Costs: The final metric is the most obvious. The Alternative that costs the most scores the lowest. This measure is blind to the utility provided by the costs. Thus, this metric only speaks to overall cost savings.

Table 6-11 presents a summary of the cost metrics used in this evaluation. Each metric provides 25 percent of the total score for an Alternative. The relative differences in scores for each metric were normalized to a 5-point scale so they could be added and compared. Only airports were used in developing the cost metrics, as the DelDOT Heliport had no costs in any Alternative.

Table 6-10 – Development Costs by Alternative

Airport	Alternative 1			Alternative 2			Alternative 3		
	Landside Costs	Airside Costs	**Total Costs**	Landside Costs	Airside Costs	**Total Costs**	Landside Costs	Airside Costs	**Total Costs**
Chandelle Estates Airport	($325,650)	$150,000	($175,650)	$325,650	$2,277,720	$2,603,370	-	-	$0
Chorman Airport	($806,000)	$365,280	($440,720)	$806,000	$2,337,263	$3,143,263	-	-	$0
Civil Air Terminal, Dover AFB	($1,027,100)	$0	($1,027,100)	$1,027,100	$0	$1,027,100	$1,027,100	$0	$1,027,100
Delaware Airpark	($2,238,350)	$0	($2,238,350)	$2,238,350	$0	$2,238,350	$9,122,000	$0	$9,122,000
Delaware Coastal Airport	($5,720,000)	$1,573,000	($4,147,000)	$5,720,000	$1,573,000	$7,293,000	$8,074,200	$1,573,000	$9,647,200
Jenkins Airport	($115,000)	$0	($115,000)	$115,000	$0	$115,000	-	-	$0
Laurel Airport	$0	$75,000	$75,000	$0	$75,000	$75,000	-	-	$0
New Castle Airport	($14,378,000)	$0	($14,378,000)	$14,378,000	$0	$14,378,000	$19,870,500	$0	$19,870,500
Smyrna Airport	($78,000)	$0	($78,000)	$78,000	$0	$78,000	-	-	$0
Summit Airport	$0	$269,280	$269,280	$0	$682,618	$682,618	-	-	$0
DELDOT Helistop	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	($24,688,100)	$2,432,560	($22,255,540)	$24,688,100	$6,945,600	$31,633,700	$38,093,800	$1,573,000	$39,666,800

Table 6-11 – Alternative Cost Metric Factors and Scores						
Metric	**Alt 1**	**Alt 1 Score**	**Alt 2**	**Alt 2 Score**	**Alt 3**	**Alt 3 Score**
Average Cost/Airport	$(2,225,554)	0	$3,163,370	4	$9,916,700	2
Convenience	$16,217	5	$210,891	3	$396,668	1
Economic Impact	($25)	0	$17.50	5	$12.20	4
Total System Costs	($22,255,540)	5	$31,633,700	2	$39,666,800	1
Total Scores		10		14		8

For cost effectiveness, the Alternative with the least amount of spending did not score highest. That was due to the lack of demand satisfaction Alternative 1 provides. Instead, it ranked second to Alternative 2, followed by Alternative 3.

5. IMPACT OF CONTINGENCIES

CONTINGENCIES INCLUDE THE POTENTIAL EXPANSION OF DELAWARE Airpark to accommodate larger business jet activity, the economic benefit of more public-use heliports in demand areas, and the impacts of technology on the alternative aviation systems. Evaluation of these contingencies was conducted in a manner whereby the results could be applied to the appropriate Alternatives. For example, the potential expansion of Delaware Airpark could impact both Alternatives 2 and 3. Similarly, the impacts of technology will be experienced by both development alternatives.

5.1 POTENTIAL EXPANSION OF DELAWARE AIRPARK

There are a number of scenarios that could result in the expansion of Delaware Airpark to a runway length of 5,000 feet or greater. For example, if the Civil Air Terminal were to be removed from public-use service for any reason (military base closure, private air cargo company lease which precluded service to other general aviation traffic, etc.), central Delaware would need a public-use, jet-capable airport. For the purposes of this analysis, it was assumed that Delaware Airpark would be expanded from 4,200 feet to 5,500 feet in length. This length may be the maximum available at the current Delaware Airpark site, but it would also serve a large percentage of the business jet fleet.

Figure 6-12 – Delaware Airpark Entrance

The airport expansion would likely take Delaware Airpark from an airport reference code (ARC) B-II facility to an ARC C-II. **Table 2-1** in the Phase 1 report showed the defined characteristics of the various reference codes. For simplicity, the main impact of a change in runway ARC at Delaware

Airpark would involve the widening of the runway from 75 feet to 100 feet. Runway lighting would have to be widened, and some taxiway segments would need to be relocated.

Table 6-12 presents the cost of expanding Delaware Airpark. As shown, the expansion would likely cost a minimum of $12.3 million, which does not include any environmental wetland remediation, or perimeter access road development.

Table 6-12 – Delaware Airpark expansion to 5,500 feet

Item	Unit	Increase	Cost Per Unit	Total Cost
Land Acquisition	Acre	148	$50,000	$7,400,000
Runway Paving - Asphalt	Square Yard	26,100	$117	$3,053,700
Taxiway Paving - Asphalt	Square Yard	11,300	$117	$1,322,100
Medium-Intensity Runway Lighting	Linear Foot	5,500	$60	$330,000
Medium-Intensity Taxiway Lighting	Linear Foot	2,900	$60	$174,000
Total Cost				**$12,279,800**

This cost would be added to each alternative, should this action be taken. As such, it would impact the total costs as follows:

- Alternative 1 – No Change
- Alternative 2 - $43,915,500 Total Cost
- Alternative 3 - $51,946,600 Total Cost

Because Alternative 1 is not responsive to this option, it is ranked last, with Alternative 2 ranking highest and Alternative 3 ranking second.

5.2 ECONOMIC BENEFIT OF PUBLIC-USE HELIPORT DEVELOPMENT

Prior to the development of public projects, the question of economic benefits is often examined. This is to prevent wasteful spending or to ensure that transportation project investments benefit the intended users. This approach was used to evaluate the potential development of new public-use heliport facilities within Delaware. In addition, an eye to the future is warranted with the discussion of passenger-carrying drones that use vertical takeoff technology. Even with such technology, designated landing areas are needed.

For purposes of this system plan, a prototypical heliport is one where landing surfaces are available, free of obstructions to air navigation. These facilities would likely be limited to no revenue-generating services, such as fuel sales or helicopter hangar storage. Instead, the heliports would function to provide easy drop off and pick up service by ground transportation.

Without a revenue source, the heliport facilities function as a transportation amenity provided by the State (assuming State funding of development). The development and maintenance costs are purely outgo. Thus, the benefits of having these facilities need to be estimated in terms of transportation efficiencies and delay savings for users.

Existing Heliports/Helipads

The only current public-use heliport is located in Dover, outside the DelDOT Administration building. Because that heliport is little used, the question as to the cost effectiveness of potential public-use heliports becomes important.

Assessing the need for additional heliport development includes the examination of the number and type of existing heliports in the two areas of study – Wilmington metro area and Coastal Delaware. In Wilmington, a list of heliports/helipads includes:

- Christiana Care Hospital – Parking Garage Roof Helipad
- Nemours, DuPont Hospital for Children – Rooftop Helipad
- Rollins Building Heliport – Rooftop Helipad
- New Castle Airport – No Marked Helipads, but Entire Airfield Accepts Helicopters

In the Delaware Coastal area, there is only one heliport listed – Barcroft Company Heliport – a private facility that does not have any markings. It is located near the Cape May – Lewes Ferry terminal. In addition, the State Police have a helicopter base at Delaware Coastal Airport. However, none of the marked heliports listed above are for public use. Helicopter operators must use private facilities where they have permission or public-use airports such as New Castle Airport or Delaware Coastal.

Size and Cost

Figure 6-13 presents the basics of a general aviation heliport as specified by the FAA. Depending upon the anticipated demand, the heliport can be a single landing pad, have multiple landing pads, or include heliport parking locations. It is assumed that for this analysis, any new public-use heliport in Delaware would include a single landing pad with at least one parking location adjacent to the landing pad.

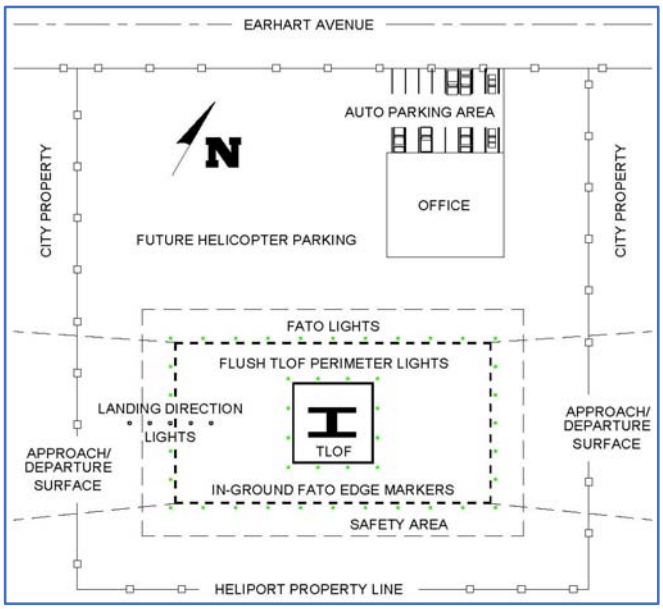


Figure 6-13 – Example Heliport Layout, Source FAA: AC 150/5390-2C
Legend: FATO=Final Approach & Take Off area. TLOF=Touchdown & Lift Off area

The minimum size of the example heliport in **Figure 6-13** is approximately 1 acre, exclusive of approach and departure surfaces off the heliport property. Minimum approach and departure slopes are 8:1. That means the heliport must be at least 280 feet away from a 35-foot tall building.

Without an office, the cost of developing a heliport is relatively inexpensive. **Table 6-13** presents the minimum cost of a public-use heliport. As shown, the cost is between $350,000 and $400,000.

Table 6-13 – Minimum Cost of Public-Use Heliport

Cost Item	Units	Unit Cost	Total
Land Purchase	1 Acre	$120,000	$120,000
TLOF Paving	400 S.Y.	$135	$54,000
Lighting/Windsock	L.S.	$100,000	$100,000
Auto Parking	400 S.Y.	$90	$36,000
Miscellaneous	L.S.	$50,000	$50,000
TOTAL COST			**$360,000**

Breakeven Usage

Assuming a 10-year payback, using a 4 percent interest rate, the heliport would have to generate a minimum of $43,750 per year in transportation savings to users. Assumptions used in estimating the benefits of heliport development included the following:

- Value of Time = $61.80/hour[2]
- Average Helicopter Occupancy = 2.5
- Average Driving Time to Nearest Airport = 20 minutes

It is the convenience of the heliport that gives it value over other transportation methods or modes. For this analysis, airports were the alternative use facilities from which time savings would be estimated.

In order to offset $43,750 per year in costs, a total of 708 hours of time saved by all-purpose helicopter air travel. The time saved per landing or takeoff is 30 minutes for the passengers, minus the pilot. Therefore, to break even on the cost of the facility, it would have to accommodate 1,416 operations per year at a minimum. That is almost 2 helicopters per day.

Given that the DelDOT heliport receives less than 50 operations per year, it is doubtful that a public-use heliport at a Delaware Coastal site could pay for itself in time savings benefits. In Wilmington, it would be difficult to generate more than 1,400 annual operations at a public-use

[2] Source: *Revised Departmental Guidance on Valuation of Travel Time in Economic Analysis*, Office of the Secretary of Transportation, September 27, 2016, adjusted for inflation.

facility in the downtown area. However, because of the population density in Wilmington, it may be easier to attract that level of demand than for a Coastal site.

Conclusion

The conclusion from this analysis is that there will not be a need in the near term for new public-use heliports in the system. However, this should be examined in the next aviation system plan to see if autonomous helicopter drones become a reality in carrying passengers to downtown metro areas or to the seashore.

5.3 IMPACTS OF TECHNOLOGY

Previous system planning efforts have not evaluated the impacts of future technology on the Alternatives. However, because technological changes have been occurring at an increasing pace, it is likely that the Delaware system will look vastly different in 20 years, relative to the existing system. Across multiple industries, disruptive innovations are occurring at a rapid pace. Some of the new technology that is either already here, or coming soon includes the following:

Figure 6-14 – UAS Small Drone

- Electric Aircraft
- Autonomous Cars
- Flying Taxis
- Virtual Reality
- Unmanned Aerial Systems (UAS) Integration
- Airport Sustainability Practices

The question for this evaluation is whether or not any of the above technological improvements favors one or more Alternatives relative to the others.

A brief examination of the factors (which were described in Chapter 2 of the Phase 1 report), indicated that most of these technology upgrades would impact the Alternatives in a relatively equal manner. However, it is believed that the advent of the electric aircraft will impact the smaller airports to a greater degree than the larger ones. This impact is from three areas:

- ***Fleet Mix:*** The smaller airports have a predominantly propeller aircraft fleet mix. It is believed that business jets will not be converting to electric power in the near or intermediate time frame. Therefore, airports most impacted will be those accommodating propeller aircraft.

- ***Fuel Sales:*** Therefore, sales of 100 LL fuel needed for airport revenues must come from aircraft using the airports. If the number of aircraft requiring fuel decreases, the revenue also decreases. At larger airports, jet fuel can be sold to the larger aircraft to maintain revenue production.
- ***Infrastructure Costs:*** The installations of electric charging stations have a cost that will be easier for larger airports to bear.

In addition, it is believed that flying taxis, if introduced to the system within the time period, would favor Alternative 2 more than the other two alternatives because the additional heliports would provide landing locations for these airborne commuters.

Given these factors, Alternative 1, followed by Alternative 2 will be impacted more severely than Alternative 3, for the electric aircraft proliferation, because there are more small airports in those two Alternatives. Even though the same number of electric powered aircraft will use the Alternative systems, Alternative 3 airports (publicly owned) will have an easier time of accommodating the new technology because of a larger revenue base.

For air taxi service using large vertical takeoff drones, Alternative 2 is favored because of the heliport development listed in that Alternative. Alternative 3 ranks last because it has the fewest potential landing sites for air taxis. **Table 6-14**, presented later, shows the scoring of each Alternative relative to technology factors.

6. SUMMARY EVALUATION MATRIX

IN ORDER TO EVALUATE EACH ALTERNATIVE, A comparative matrix was developed that could rank each criterion for each Alternative. That way, some features that scored higher than others could be mixed into a hybrid Alternative for inclusion in the Recommended Plan. **Table 6-14** presents the evaluation matrix for the Alternatives Analysis.

Table 6-14 – Evaluation Matrix for System Alternatives

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
COVID-19	4	2	3
Closing Private Airports			
Increased Surface Access Time	4	5	2
Facility Needs	1	5	4
Environmental Consequences	4	4	3
More Funding of Private Airports	2	5	4
Cost Effectiveness	3	5	2
Contingencies			
Expansion of Delaware Airpark	1	4	3
Economic Benefits of Heliports	4	3	3

Table 6-14 – Evaluation Matrix for System Alternatives			
Evaluation Criteria	**Alternative 1**	**Alternative 2**	**Alternative 3**
Impacts of Technology	2	4	3
Total Scores	**25**	**37**	**27**

In scoring these evaluation criteria, the analysis findings for each was converted to a 5-point normalized scale. For example, the Cost Effectiveness analysis resulted in scores of 10, 14, and 8 for Alternatives 1, 2, and 3, respectively. These were converted to scores of 3, 5, and 2, as shown in the table. For some other conversions, subjective reasoning was included in the process. For example, the Expansion of Delaware Airpark scored 1, 4, and 3 for Alternatives 1, 2, and 3, respectively. The reasoning concluded that Alternative 1 was completely unresponsive to the option (no development). Therefore, it scored a "1." Alternative 2 incorporated the option and cost less than Alternative 3. Therefore, scores of 4 and 3 were given, respectively.

From the Evaluation Matrix, it can be seen that Alternative 2 ranking highest with a score of 37, followed by Alternative 3 with a score of 27, and lastly by Alternative 1 with a score of 25. The application of this finding is that keeping the current system and investing in its expansion (Alternative 2) is better than allowing all of the private airports to close. However, even if they do close, the expansion of the remaining publicly owned airports (Alternative 3) is better than keeping all of the airports open and not investing in them (Alternative 1).

In the next Chapter, the Recommended Plan will be detailed, along with its forecast facility needs, by phase and cost.

Figure 6-15 – DSU Twin Engine Trainer Aircraft

Chapter 7

Recommended Aviation System

RECOMMENDED AVIATION SYSTEM

THE RECOMMENDED SYSTEM OF AIRPORTS WAS SELECTED using the results of the evaluation of alternatives as quantified by the final matrix analysis. Because of the quantitative nature of matrix analyses, airports from different alternatives can be combined to form a preferred system without compromising the integrity of the analysis. In this manner, a preferred system of airports represents a composite of the best features of each of the individual alternative systems. Given the results of the evaluation, it was anticipated that both NPIAS and privately-owned airports would make up the recommended system. With new State aviation funding available, the recommended plan features a number of non-federally eligible projects.

Figure 7-1 – Airport Windsock

The recommended system was formalized by defining it components. This included the definition of future airport and heliport roles, configuration of airports and heliports, the total funding requirements, and the staged financial development of the most effective system of airports and heliports for Delaware. This Chapter is organized to include the following sections:

- Selection of Preferred Alternative
- Description of Recommended Aviation System

1. SELECTION OF PREFERRED ALTERNATIVE

The selection of a preferred alternative aviation system had to consider the original goals and objectives of the system plan, the inherent scoring of each alternative against each other alternative, and a number of judgmental factors.

1.1 STUDY GOALS

There were seven overall study goals for the Aviation System Plan. These goals were taken from the Delaware Long Range Transportation Plan and modified to fit the aviation travel mode. Each of these goals had a number of objectives with which to measure goal achievement.

- ***Goal 1 - Economic Vitality:*** Promote and strengthen the economic vitality of Delaware with an excellent aviation transportation network that meets the needs of a diverse and growing economy.
- ***Goal 2 - Safety and Security:*** Ensure the safe and secure movement of people and goods while limiting the potential for incidents that may cause harm or disrupt aviation operations.
- ***Goal 3 - Quality of Life:*** Maintain and enhance vibrant and appealing communities and support planned growth and development through an aviation transportation network that serves the mobility needs of Delawareans.
- ***Goal 4 - System Preservation:*** Provide access to safe, attractive, and reliable transportation options and enhance integration of a well-connected multi-modal transportation system.
- ***Goal 5 - System Management and Operations:*** Enhance system management and operations through innovative strategies and technology that increase the efficiency of the aviation transportation system.
- ***Goal 6 - Travel and Tourism:*** Facilitate efficient mobility options for tourist destinations that support Delaware residents, businesses, and visitors.
- ***Goal 7 - Customer Service & Communication:*** Provide the highest level of customer service possible in order to proactively provide information and to learn from and address Delaware customers' needs.

In order to select the recommended plan, the objectives from the various system planning goals were consulted. **Table 7-1** presents a summary of the objectives within each system planning goal. Two columns on the right side of the table indicate whether or not the objective was considered as a part of the system planning effort and whether or not the objective was used as a decision factor in selecting the recommended plan.

Table 7-1 – Role of System Plan Objectives in Selection Process

	System Plan Goals/Individual Objectives	Considered	Decision Factor
	Economic Vitality		
1	Continue to invest in the growth of the Civil Air Terminal (CAT) at the Dover Air Force Base (DAFB) due to the increased flexibility of the Joint Use Agreement.	Yes*	Yes
1	Continue to provide capital funds to assist with 10 percent sponsor match requirements of FAA Airport Improvement Program (AIP) grants at federally-eligible airports in the National Plan for Integrated Airport Systems (NPIAS).	Yes	No
1	Coordinate with the Delaware Prosperity Partnership (DPP) to identify future economic development opportunities and identify specific resources that can be provided.	Yes**	No
1	Update and maintain an Economic Impact Assessment of Aviation in Delaware and provide the output data to aviation stakeholders and policy makers for use in decision-making.	Yes	Yes

Table 7-1 – Role of System Plan Objectives in Selection Process			
System Plan Goals/Individual Objectives		**Considered**	**Decision Factor**
1	Develop and maintain a program for identifying specific facility needs at system airports, including privately owned airports that may be eligible for State funding.	Yes	Yes
1	Develop a program to provide limited capital funds for airport improvements at public-use airports that are not classified as NPIAS airports and therefore ineligible for federal AIP grant funds.	Yes	Yes
	Safety and Security		
2	Continue periodic safety inspections to update the master records (FAA Form 5010) for Delaware's public-use airports and improve data collection procedures through staff training and new technology.	Yes*	No
2	Improve the airspace obstruction review process by evaluating current regulations, technical criteria and the application process to develop new efficiencies and technological advancements.	Yes*	No
2	Develop outreach materials to increase public awareness about agricultural spraying flights and related safety tips.	Yes**	No
	Quality of Life		
3	Coordinate with local government agencies to ensure that current zoning and future land use plans consider the impacts of development to the operations at airports.	Yes	Yes
3	Identify methods to educate local community members about the value and potential of Delaware's airports, such as events, publications and contests.	Yes	No
3	Reach out to local community groups and Homeowners Associations (HOAs) to find opportunities to spread awareness.	No*	No
	System Preservation		
4	Coordinate with airport management, private businesses and government officials to identify opportunities to integrate Unmanned Aircraft Systems (UAS) technology into airport operations.	Yes**	Yes
4	Update the current Aviation System Plan (Phases I and II) to establish statewide goals, forecast aviation demand and recommend future capital funding priorities.	Yes	Yes
4	Identify potential airspace obstruction mitigation projects to preserve the safe operation of the aviation system.	Yes*	No
	System Management and Operation		
5	Continue collecting sample data of the number of take-offs and landings at non-towered airports and develop more efficient and precise sampling techniques.	Yes*	Yes
5	Evaluate the current state licensing procedures for public-use airports and determine if changes are necessary.	No*	No
5	Review State aviation regulations to ensure there is a mechanism to fund eligible capital needs for privately-owned, public-use airports.	Yes	Yes

Table 7-1 – Role of System Plan Objectives in Selection Process			
System Plan Goals/Individual Objectives		**Considered**	**Decision Factor**
5	Improve the partnership with Delaware State University (DSU) to expand opportunities to support the Aeronautics Program through staffing and research.	Yes	No
5	Evaluate the current DelDOT Helipad lighting system and determine if upgrades or a full replacement is needed.	Yes	No
	Travel and Tourism		
6	Partner with the Division of Small Business, Development & Tourism to identify current programs and/or develop new programs to promote General Aviation (GA).	Yes**	Yes
6	Examine the impacts of future technology (other than UAS) on the aviation system and how gains in personal transportation technology may provide opportunities for tourism at the beach communities and other Delaware locations.	Yes	Yes
	Customer Service & Communication		
7	Continue to engage the Delaware Aviation Advisory Council (DAAC) to advise staff on the development and prioritization of strategies for the Aeronautics Program.	Yes	Yes
7	Rebuild the Aeronautics Program website to promote Delaware aviation to new audiences.	Yes*	No

* Not included in Work Scope
** To be completed in Financial & Implementation Plan

1.2 ALTERNATIVE EVALUATION SCORING

The scoring for each alternative was based, in part, on the list of objectives shown above. In each case where a decision factor is marked "Yes," that factor was considered in the evaluation process. In some cases, the impact of the objective is indirect, such as the use of sample data for aircraft operations at system airports. These operations counts figured into a number of decision formulas. However, that was only a partial input to the overall decision process.

From Chapter 6, there were six evaluation criteria with associated sub-criteria, including:

- Impact of COVID-19 on Airport Alternatives
- Potential Impacts of Private Airports Closing
  - Increased Surface Access Times:
  - Environmental Impact Differences
  - Capital Cost Differences
- Impacts of Greater Funding of Privately Owned, Public-Use Airports:
- Cost-Effectiveness
- Impact of Contingencies
  - Potential Expansion of Delaware Airpark
  - Economic Benefit of More Public-Use Heliports

- Impacts of Technology on Aviation Systems

Table 7-2 presents the scoring of Alternatives from the Chapter 6 analysis.

Table 7-2 – Evaluation Matrix for System Alternatives

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
COVID-19	4	2	3
Closing Private Airports			
Increased Surface Access Time	4	5	2
Facility Needs	1	5	4
Environmental Consequences	4	4	3
More Funding of Private Airports	2	5	4
Cost Effectiveness	3	5	2
Contingencies			
Expansion of Delaware Airpark	1	4	3
Economic Benefits of Heliports	4	3	3
Impacts of Technology	2	4	3
Total Scores	**25**	**37**	**27**

As shown, Alternative 2 ranked first, followed by Alternative 3, and finally by Alternative 1. The application of this finding is that keeping the current system and investing in its expansion (Alternative 2) is better than allowing all of the private airports to close. However, even if they do close, the expansion of the remaining publicly owned airports (Alternative 3) is better than keeping all of the airports open and not investing in them (Alternative 1).

COVID-19 Impacts

Impacts to Delaware's public-use airport system will vary, depending upon the length of time the economy is shut down. A short shut down period would be followed by a fairly quick rebound. However, the longer it goes, the more difficult and time consuming will be the rebound. Our current assumption is that the rebound will require all of 2021 to reach 2019 levels of demand. It is assumed that both general aviation and airline demand will be negatively impacted during this period. However, general aviation demand has shown more resiliency than airline passenger demand at the time of this writing (August 2020).

By delaying the launch of Frontier Airline service (February 2021) and the startup of Xtra Airlines, increases in jet fuel sales will have to wait. If air travel protocols change permanently, where social distancing on the airplane is required, the load factors will plummet and create financial feasibility issues for the airlines. If they have to raise prices to cover costs, that in turn, can further dampen demand.

The impacts of the reduction in demand, revenues, and capital spending caused by COVID-19 are all intertwined. An economic recession causes reductions in each of these factors through a complex but interrelated process. Given that Alternative 1 had no capital spending above those levels already committed, it would be impacted less than the other Alternatives which include capital spending. With less revenues in the mix, Alternative 2 is impacted the greatest because of the number of privately owned airports that must compete for operating revenue, while maintaining their infrastructure.

Closing Private Airports

Evaluation of impacts stemming from this potential occurrence can be measured across all alternatives include using at least three criteria: increased surface access time; facility needs; and environmental impact differences. There is also a cost component, which is measured in a separate evaluation process.

Because of the lack of facilities, Alternative 3 had the greatest increase in surface access time, followed by Alternatives 2 and 1. For facility needs, Alternative 2 showed the greatest amount followed by Alternative 3, and finally by Alternative 1 (no-build option). For environmental impact, the primary evaluation criterion was potential noise impact on residential housing. In all cases, more residential housing will be impacted by potential aircraft noise through the closures of privately owned airports. While Summit Airport and Smyrna Airport have some residential housing nearby, the airports to which they are transferring have more and denser residential developments.

Scoring of alternatives showed that cumulative points for Alternatives 1 and 3 were 9 each. Alternative 2 scored highest with 14 points. This indicated that overall, closing privately owned airports is not a good policy for the aviation system. If possible, these facilities should be preserved in order to optimize the value of public-private investment partnerships for Delaware airports.

More Funding of Private Airports

There are a number of assumed positive impacts provided by the increased funding availability for private airports in the system. These include: more facilities available at each airport; greater safety margins because of projects such as runway repair, obstacle removal, better lighting, marking, etc.; DelDOT review and input for projects; and improvement of the lifespan of

Figure 7-1 – Chandelle Estates Airport

private airports because of outside funding of some fixed costs. In addition, airport owner grant assurances to the State will provide some incentive to remain open as an airport. And finally, more funding of private airports provided more economic development potential and jobs because of more possible locations for aviation businesses.

When all the factors were evaluated, Alternative 2 ranked highest because it was the only Alternative that allowed funding for privately owned airports as a part of its definition.

Cost Effectiveness

The total cost of an Alternative is not the best measure of cost-effectiveness. That is, a less expensive Alternative may not provide adequate services (Alternative 1 for example). There are other factors that enter the equation, such as average cost per airport, convenience, and economic impact.

Alternative 1 was eliminated because it was non-responsive to the needs of the aviation system. Of the build options, Alternative 2 was priced at $31.6 million, while Alternative 3 cost $39.7 million. The average cost per airport was $3.2 million for Alternative 2 and $9.9 million for Alternative 3. From a convenience standpoint, Alternative 2 had the lower cost per unit of access time – almost 50 percent lower than Alternative 3. Finally, from an economic impact perspective, Alternative 2 had the highest return on investment. That is, for every dollar spent on capital improvements, Alternative 2 returned $17.50, while Alternative 3 returned $12.20 per invested dollar.

After consideration of all these factors, Alternative 2 ranked highest regarding cost-effectiveness.

Contingencies

There were three sets of contingencies examined in the Evaluation of Alternatives. For the most part, these contingencies did not impact the selection of a preferred alternative. They included: the expansion of Delaware Airpark to accommodate larger business jet activity; the economic benefit of more public-use heliports in demand areas; and the impacts of technology on the alternative aviation systems.

The expansion of Delaware Airpark could occur in either Alternative 2 or Alternative 3. It could not occur in Alternative 1. Because the expansion of Delaware Airpark would still be less expensive under Alternative 2, it ranked highest, with Alternative 3 second.

Figure 7-2 – Delaware Airpark Entrance

The economic benefit of heliport development concluded that more than 1,400 annual operations by helicopters at each public heliport would be needed to justify the costs of construction. Because this was highly unlikely in the near term, Alternative 1 (status quo - no build) scored slightly higher than the two action Alternatives.

Finally, the improvements in technology focused on the coming electric-powered aircraft and the potential drone air taxi, similar to the Uber Elevate model. In scoring these impacts, Alternative 3 ranked best regarding the accommodation of electric aircraft and their impact on fuel sales because of the publicly owned airports' access to municipal operating funding. In addition, the higher activity levels at each airport in Alternative 3 would dampen the potential overall revenue loss impacts. When considering the vertical take-off air taxi business, Alternative 2 ranked highest because it had more potential landing sites than Alternative 3. On an overall basis, Alternative 2 ranked higher than Alternatives 1 or 3 with regard to technology impacts.

Combining all of the scores for all criteria, Alternative 2 – *Expansion of Existing Aviation System* consistently ranked better. Intuitively, the ability to provide more aviation services and facilities for a lower cost makes sense. That is what Alternative 2 delivers, relative to Alternative 3. Even if Alternative 1 ranked better in some individual criterion, the option only serves as a benchmark and does not meet the goals or objectives of the system plan. For these reasons, and the fact that the State now has dedicated money to support privately owned, public-use airports in infrastructure development, Alternative 2 was selected as the Recommended Aviation System.

2. DESCRIPTION OF RECOMMENDED PLAN

THE RECOMMENDED AVIATION SYSTEM WAS SELECTED in the previous section from the preferred alternative scoring. From that analysis, Alternative 2 emerged as the preferred alternative. As the recommended plan, it can be described in terms of the following:

- Recommended Aviation System
- Airport Roles
- Individual Airport Recommendations

Other recommendations pertaining to the recommended system are presented in Chapter 8, Financial and Implementation Plan.

2.1 RECOMMENDED AVIATION SYSTEM

The Recommended Aviation System, Alternative 2, projects the system best suited to State policy and financial support. Because it ranked highest relative to the evaluation criteria and the meeting of Long Range Transportation Plan goals and objectives, it fits best in satisfying air transportation

demand in Delaware over the long term. The Recommended Aviation System is not a Plan. It is a concept that requires additional descriptions of how it will be financed and implemented.

In this section, the overall description of the Recommended System are presented. These recommendations for the shape and character of the future aviation system can be briefly identified as follows:

- Ten public-use airports (four publicly owned and six privately owned airports) are included in the Recommended Aviation System (see **Figure 7-5**).
  - Publicly owned airports include New Castle, Delaware Airpark, Delaware Coastal, and the Civil Air Terminal at Dover Air Force Base.
  - Privately owned airports include Summit, Smyrna, Jenkins, Chandelle Estates, Chorman, and Laurel Airports.
- Dover AFB is assumed to have full joint-use capability and be available to the public for operations. It is assumed that the military will continue its heavy-lift air transport mission from the Base.
- Delaware Airpark, while currently at 4,200 feet of runway length, is keeping open the possibility of expanding the runway to 5,000 feet or more.
- It is possible and likely that the Civil Air Terminal will have some type of private operator, whether Maintenance/Repair/Overhaul (MRO), Fixed Base Operator (FBO), or air cargo within the planning period.
- Delaware Coastal Airport is assumed to develop 6,000 feet of useable runway length, from its current length of 5,500 feet.
- Summit Airport may extend their primary runway to 5,000’ or more to better serve the corporate aircraft market.
- Chorman Airport will likely construct a replacement 3,600' X 60' runway.
- New Castle Airport is anticipated to gain airline service, beginning in 2021. DRBA is scheduled to relinquish its operator’s lease with New Castle County in 2025.
- While all the existing privately owned airports are included in the Recommended System, not all may survive another 20 years as airports. Currently, Jenkins Airport may have significant challenges in remaining a functioning airport for the long term.

Figure 7-3 – Delaware State University Training Aircraft

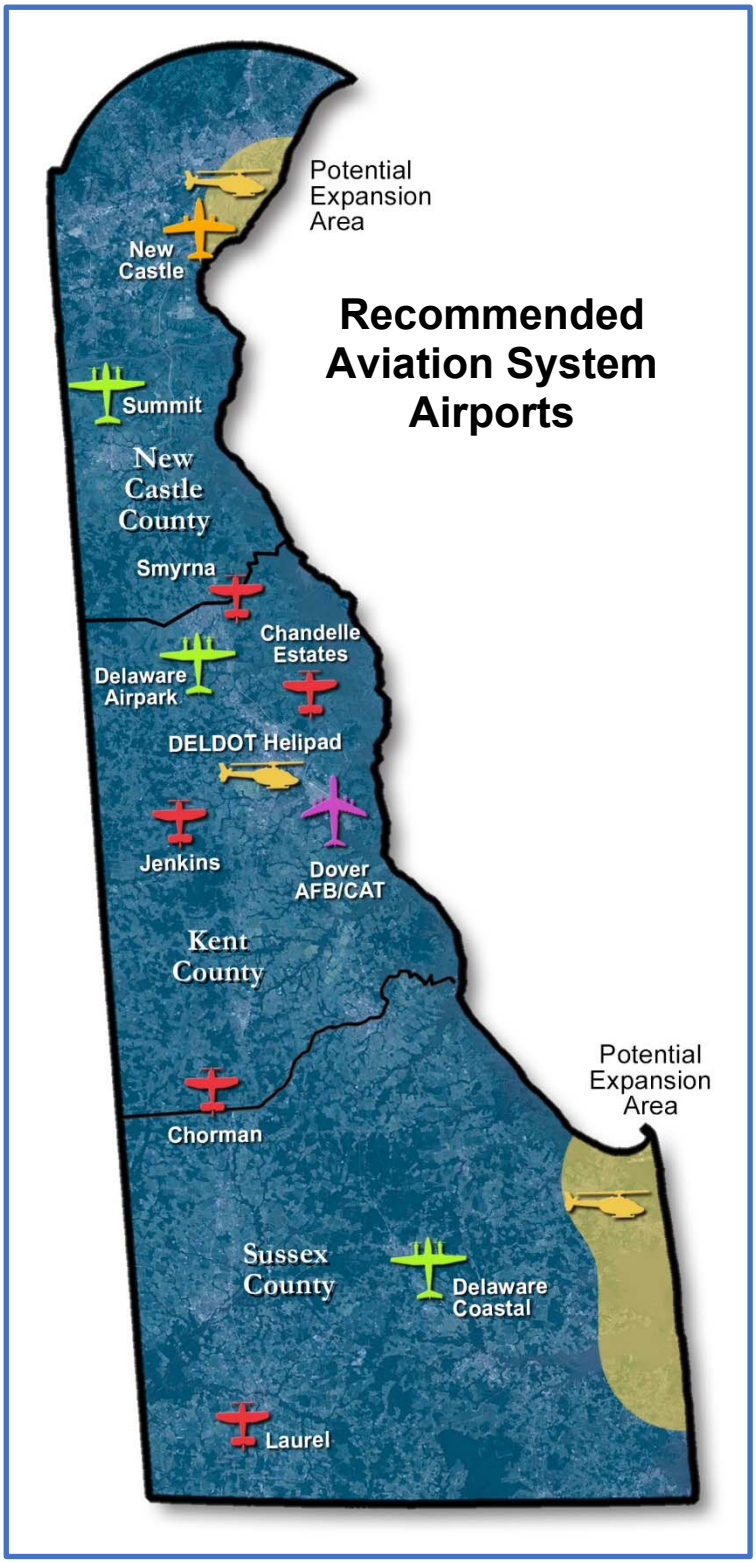


Figure 7-4 – Recommended Aviation System

With this future aviation system in mind, the following sections describe the individual airport roles, facilities, and costs associated with the Recommended Aviation System.

2.2 AIRPORT ROLES

The Recommended Aviation System includes the future roles for each airport, based upon the projected levels of demand along with input from current local airport planning work. These roles group airports into categories that relate to the air transportation service that each offers. In Phase I of this study, FAA classifications of system airports were presented.

In a brief recap, **Table 7-3** presents a summary of the Airport Reference Code aircraft categories and their operating and dimensional characteristics. The ARC is represented by a letter and Roman numeral. The letter defines the approach category and is based on the approach speed, or 1.3 times the stall speed of the design aircraft. The Roman numeral, which indicates the design group, is based on the wingspan or the tail height of the design aircraft, whichever is more demanding.

Table 7-3 - Airport Reference Code (ARC)		
Aircraft Approach Category	**Approach Speed**	
A	Less than 91 knots	
B	91 knots or more but less than 121 knots	
C	121 knots or more but less than 141 knots	
D	141 knots or more but less than 166 knots	
E	166 knots or more	
Airplane Design Group	**Wingspan**	**Tail Height**
I	Up to but not including 49 feet	Up to but not including 20 feet
II	49 feet up to but not including 79 feet	20 feet up to but not including 30 feet
III	79 feet up to but not including 118 feet	30 feet up to but not including 45 feet
IV	118 feet up to but not including 171 feet	45 feet up to but not including 60 feet
V	171 feet up to but not including 214 feet	60 feet up to but not including 66 feet
VI	214 feet up to but not including 262 feet	66 feet up to but not including 80 feet

Source: FAA Advisory Circular 150/5300-13A

Under this system, short runway airports and turf airports are classified as A-I and Less than A-I, respectively. Other airports are classified, based upon their design characteristics and critical aircraft type usage. In this regard, each of the State's airports can be classified by ARC as follows (**Table 7-4**):

Table 7-4 - Airports by ARC		
A-I or Less:	**B-I, B-II, or B-III**	**C-I or Higher**
Chandelle Estates Airport	Chorman Airport	New Castle Airport
Jenkins Airport	Delaware Airpark	Civil Air Terminal at Dover AFB
Laurel Airport	Delaware Coastal Airport	
Smyrna Airport	Summit Airport	

2.3 INDIVIDUAL AIRPORT RECOMMENDATIONS

In this section, each of the Recommended System Airports is shown with its proposed role, facilities, costs, and other attributes. The information shows the existing and year 2040 data, indicating its recommended build-out during the planning period. Because growth is anticipated after that period, these recommendations are not necessarily ultimate build-outs. For those airports with available physical space, additional development may occur and will be covered in future aviation system plans.

Chandelle Estates Airport / 0N4

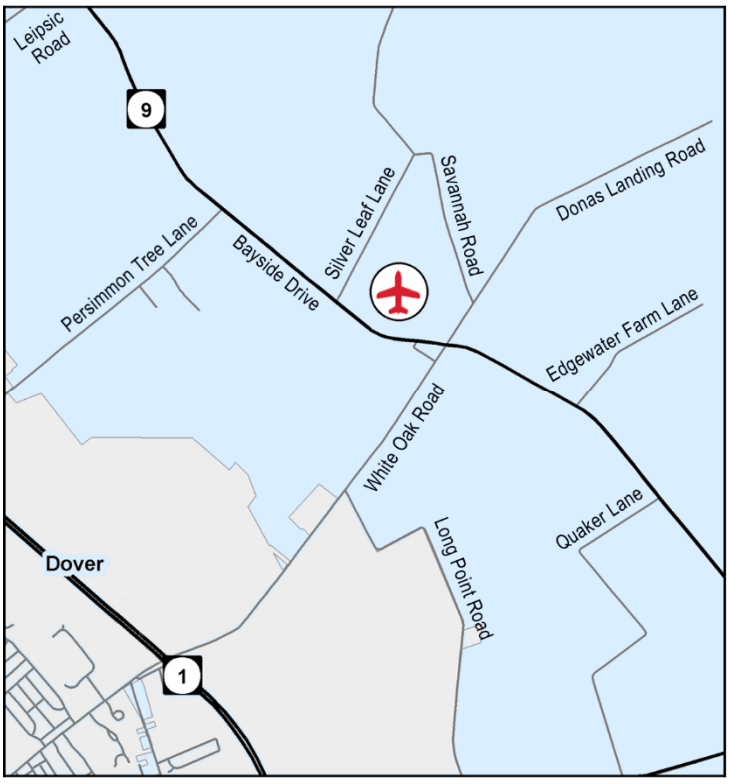
Kent County / City of Dover

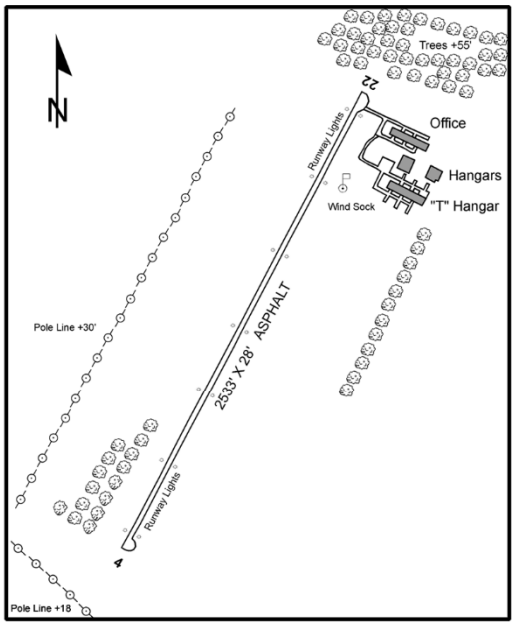
For the Recommended Plan, Chandelle Estates facility recommendations include the widening of the runway from 28 feet to 60 feet, and its reconstruction. In addition, visual landing aids (PAPI) along with some apron and hangar additions are recommended. Changes from the Preferred Alternative (2) as presented in the Evaluation of Alternatives include the recommendation for additional obstruction removal and mitigation on each runway end. Trees on the east end and a utility line on the west side still present obstructions to air navigation.

Chandelle Estates Airport / 0N4

Kent County / City of Dover

Lat/Long:	39-12-08.3N / 075-29-07.5W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	Less than A-I	Same
Runway Information		
Orientation:	4-22	Same
Length:	2,533	Same
Width:	28	60
Surface Type:	Asphalt	Same
Taxiway:	Stub	Same
Lighting:	LIRL	NONE
Visual Aids/Navaids:	NONE	PAPI
Services:		
Fuel available:	100 LL	Same
Hangar Space:	22,000	Plus 2 T-Hangars
Apron Area:	500 SY	Plus 1,450 SY
FBO/Operator:	RJR Aerodrome	Same
Based Aircraft:	24	26
Aircraft operations:	1,100	1,200
Airspace:	D & E (Ground - up)	Same



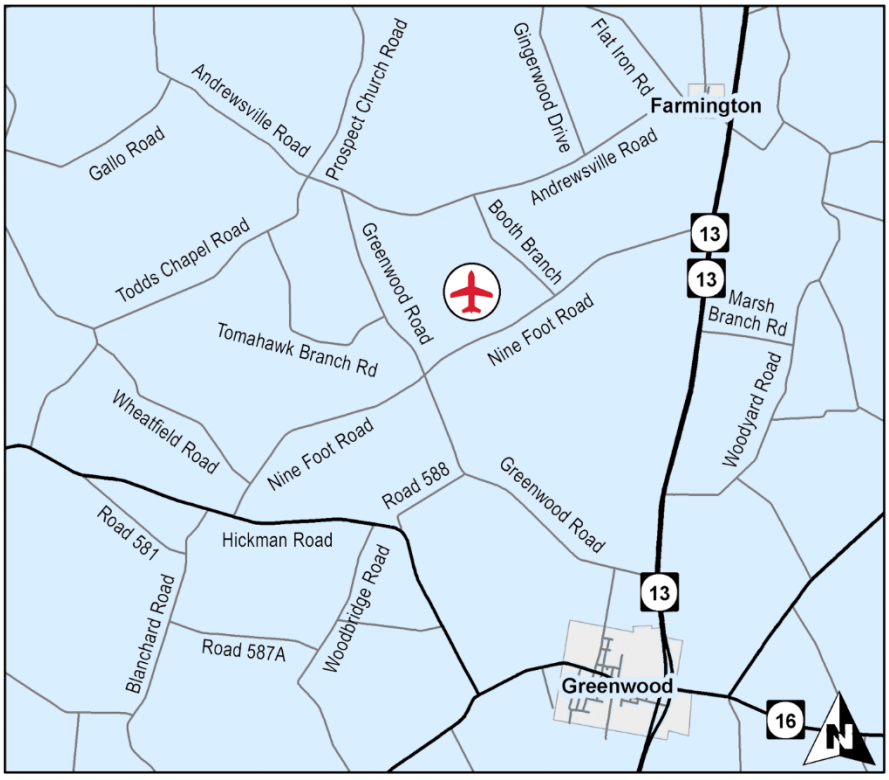


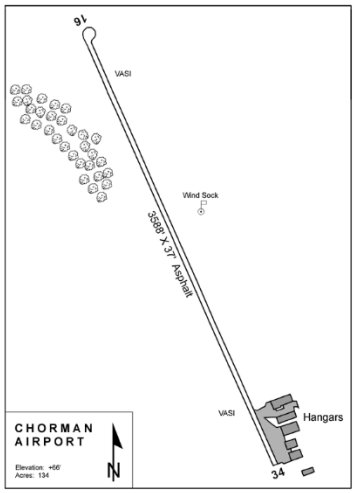
Chorman Airport / D74
Kent County / City of Farmington

The Recommended Plan for Chorman Airport involves a number of facility improvements, including obstruction removal, runway widening and overlay, and additional T-Hangars and conventional hangar space. In addition, runway lighting and visual approach aids (PAPI) are recommended. Chorman Airport has been a high growth facility in terms of based aircraft and activity. The commercial aerial spray operation impacts the entire State for agriculture and mosquito control.

Chorman Airport / D74
Kent County / City of Farmington

Lat/Long:	38-50-58.375N / 075-36-46.01W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	B-I	Same
Runway Information		
Orientation:	16-34	Same
Length:	3,588	Same
Width:	50	60
Surface Type:	Asphalt	Same
Taxiway:	Stub	Full Parallel
Lighting:	LIRL	MIRL
Visual Aids/Navaids:	REIL	REIL, 2 PAPI
Services:		
Fuel available:	100 LL, Jet-A	Same
Hangar Space:	79,800 SF	Plus 5 T-Hangars, 3,200 sf C-Hangar
Apron Area:	1,450 SY	Same
FBO/Operator:	Allen Chorman & Son, Inc.	Same
Based Aircraft:	44	52
Aircraft operations:	13,500	15,900
Airspace:	G & E (E Begins at 1,200 AGL)	Same

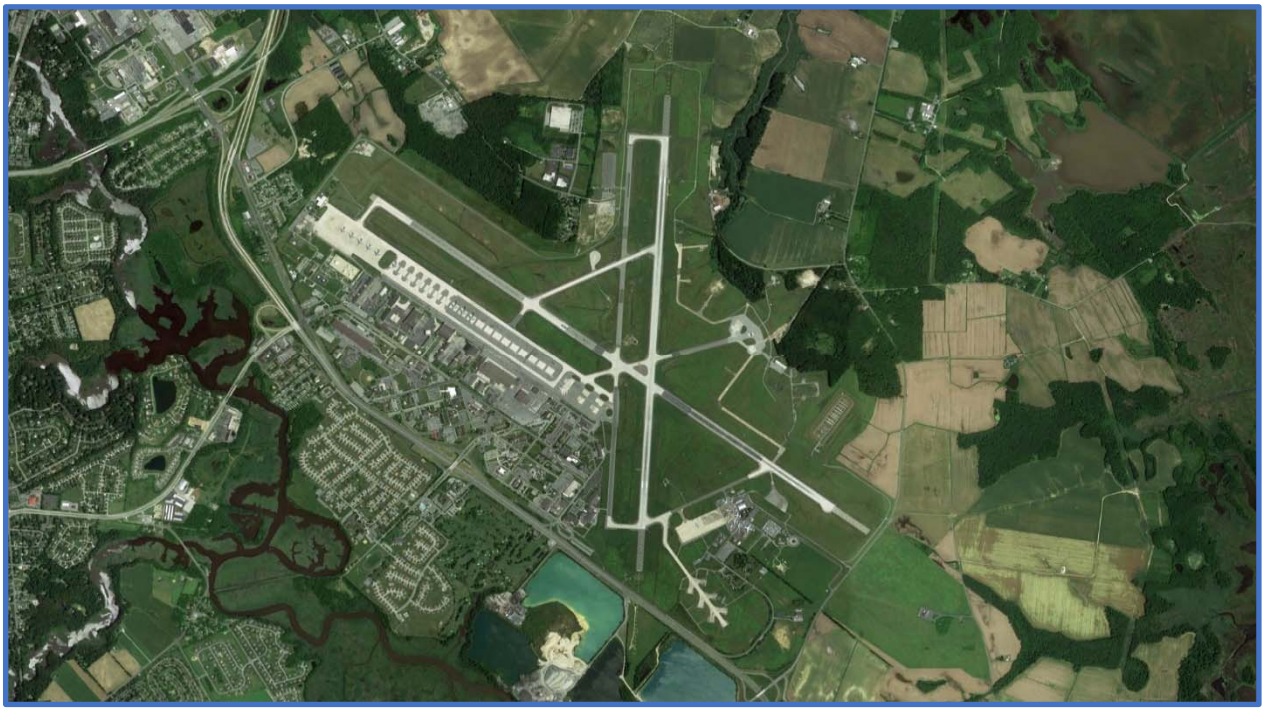




Civil Air Terminal at Dover AFB / DOV

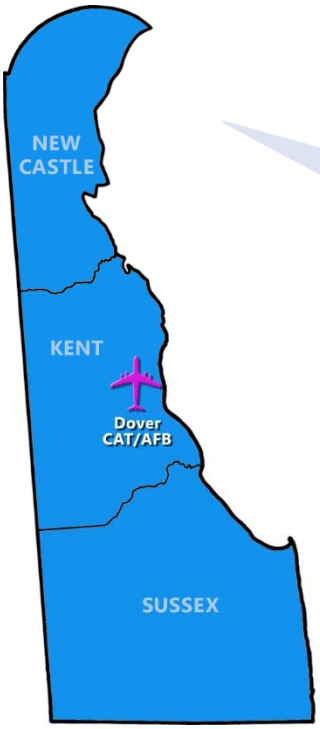
Kent County / City of Dover

The Recommended Plan for the Civil Air Terminal at Dover AFB is mostly static, with regard to facility development. However, flexibility is built in by including "developer options" for hangar space and apron area. Those projects will likely require public-private partnerships. The Recommended Plan includes the doubling of the size of the existing terminal building, in order to better accommodate NASCAR weekend traffic, when it occurs. In addition, 30 more paved auto parking spaces are planned to help with the deployment of rental cars during race weekends.

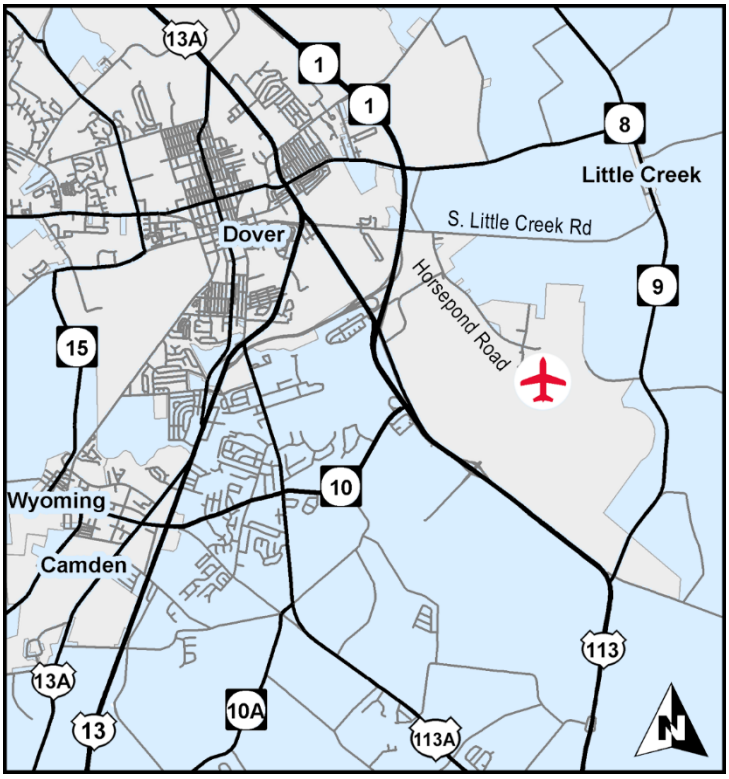


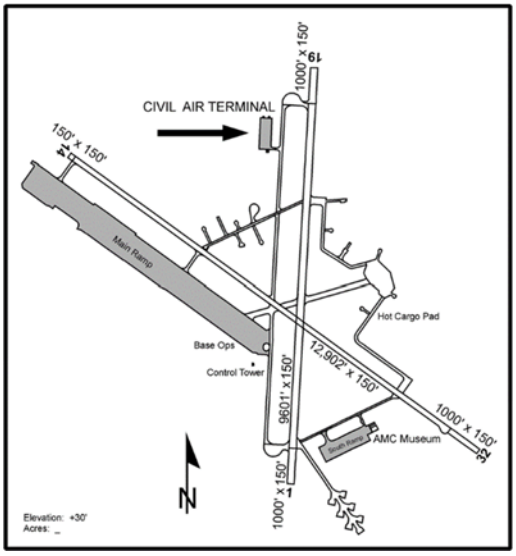
Civil Air Terminal at Dover AFB / DOV

Kent County / City of Dover



Lat/Long:	39-07-46.34N / 075-27-57.46W	
	Existing	**2040**
Role:	Joint Use – GA/Military	Same
ARC:	E-VI	Same
Runway Information		
Orientation:	14-32/ 01-19	Same
Length:	12,903 / 9,602	Same
Width:	150/150	Same
Surface Type:	Asphalt & Concrete/Concrete	Same
Taxiway:	Full Parallel/Parallel/Stub Access	Same
Lighting:	HIRL/HIRL	Same
Visual Aids/Navaids:	PAPI-4, REIL/ PAPI-4, ALSF2, ALSF1	Same
Services:		
Fuel available:	Jet-A	Same
Hangar Space:	None	Developer Option
Apron Area:	6,500	Developer Option
FBO/Operator:	DRBA	Same
Based Aircraft:	0	0
Aircraft operations:	200	1,400
Airspace:	Class D (Ground – Up)	Same





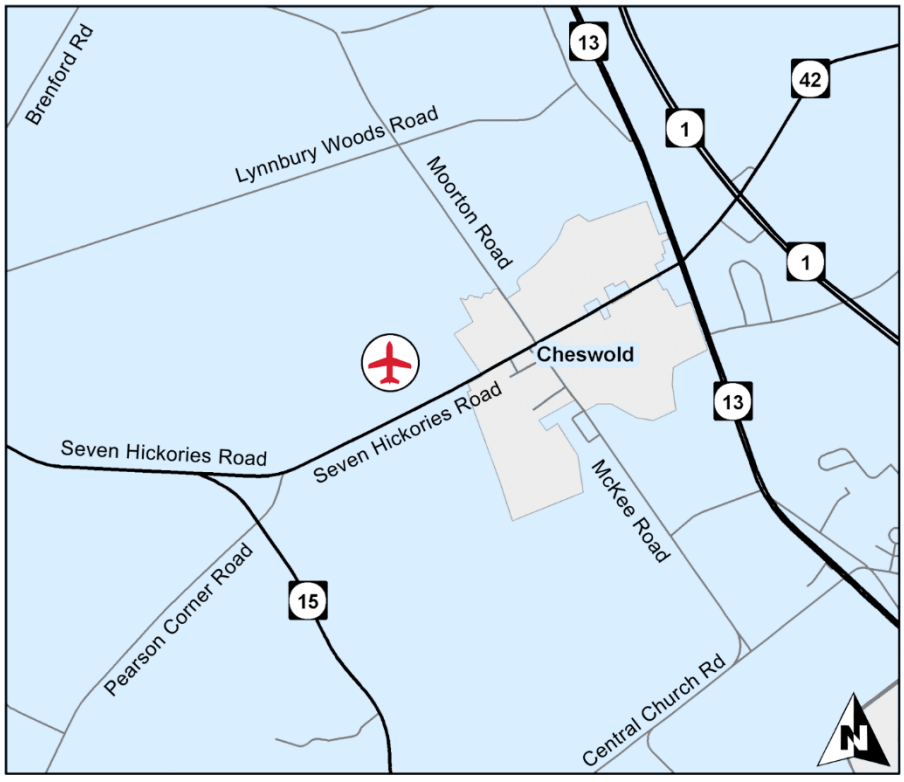
Delaware Airpark / 33N
Kent County / City of Dover

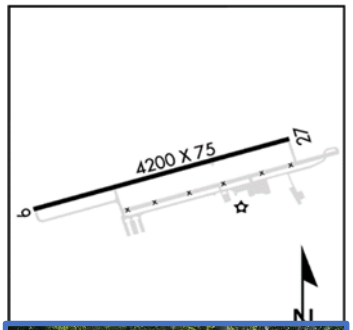
For the Recommended Plan, Delaware Airpark facility recommendations include a significant amount of new hangar space. This will help accommodate aircraft from the Delaware State University flight training program and other local growth. Recommendations that differ from the Preferred Alternative (2) as presented in the Evaluation of Alternatives include the use of the Contingency Option, where the runway is extended to 5,500 feet and widened to 100 feet. This provides assurance of corporate jet access to the State Capital, in the event Dover Air Force Base is closed to civil aviation activity in the future for any reason. This recommendation will also help in planning to protect land uses to the west of the Airport runway from non-compatible development.

Delaware Airpark / 33N

Kent County / City of Dover

Lat/Long:	39-13-07.3N / 075-36-01.7W	
	Existing	**2040**
Role:	Public, GA, Local	Public, GA, Regional
ARC:	B-II	C-II
Runway Information		
Orientation:	09-27	Same
Length:	4,201	5,500
Width:	75	100
Surface Type:	Asphalt	Same
Taxiway:	Full Parallel	Same
Lighting:	MIRL	Same
Visual Aids/Navaids:	REIL, 2 PAPI	Same
Services:		
Fuel available:	100LL	100LL & Jet-A
Hangar Space:	31,400	Plus 23 T-Hangars & 3,200 sf C-Hangar
Apron Area:	18,400	Same
Fixed Base Operator:	DRBA	Same
Based Aircraft:	29	60
Aircraft operations:	23,600 Annually	48,900
Airspace:	Class G & E (E Begins at 700 AGL)	Same





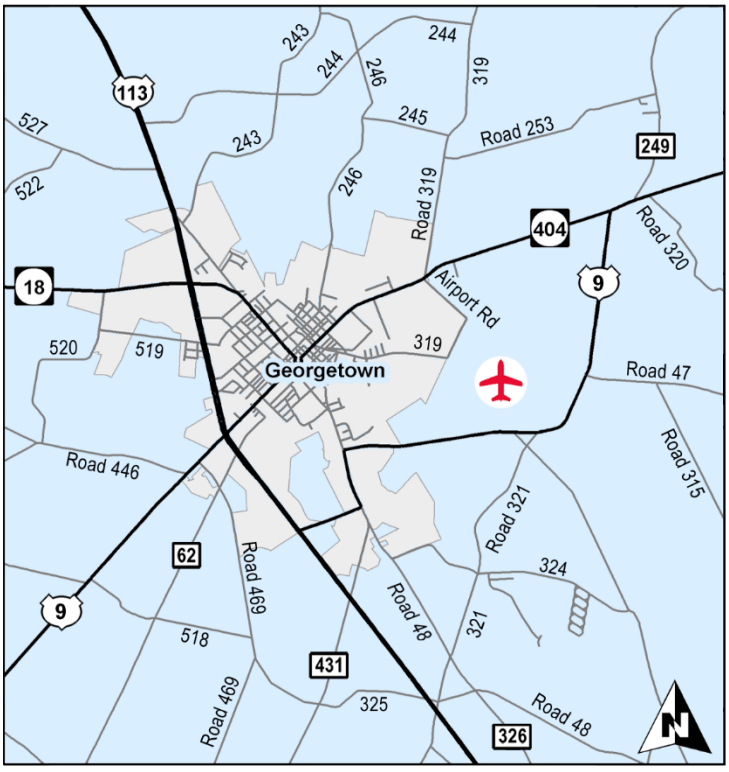
Delaware Coastal Airport / GED
Sussex County / City of Georgetown

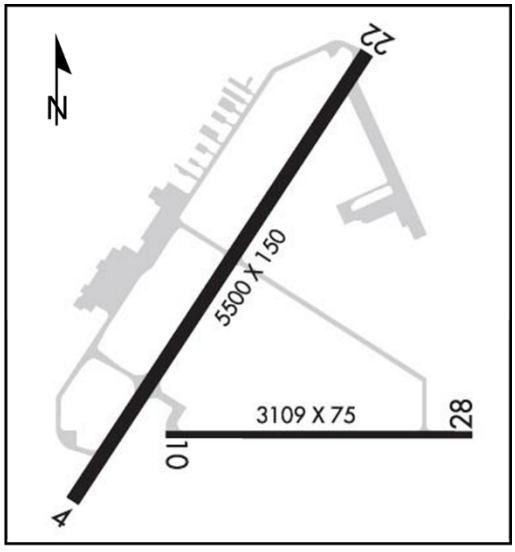
The Recommended Plan for Delaware Coastal Airport includes facility improvements such as a 500-foot runway extension of 4-22, additional hangar space totaling more than 50,000 square feet, and overlays of the runways, taxiways, and apron areas. The Recommended Plan does not examine the mid-field development options which will be analyzed in the on-going Airport Master Plan. It is noted that Park Avenue, on the south side of the Airport will need to be relocated to permit the runway extension. ALOFT will continue to be the major tenant at the Airport, and growth in based aircraft will include both small GA and more business jets.

Delaware Coastal Airport / GED

Sussex County / City of Georgetown

Lat/Long:	38-41-15.5N / 075-21-33.5W	
	Existing	**2040**
Role:	Public, GA, Regional	Same
ARC:	B-III, C-III	Same
Runway Information		
Orientation:	4-22/10-28	Same
Length:	5,500/3,109	Same
Width:	150/75	Same
Surface Type:	Asphalt	Same
Taxiway:	Full Parallel/Stub Access	Same
Lighting:	MIRL/MIRL	Same
Visual Aids/Navaids:	PAPI-4, REIL, MALSR / PAPI-2, REIL	Same
Services:		
Fuel available:	100 LL, Jet-A	Same
Hangar Space:	264,250	Plus 12 T-hangars, 36,800 sf C-hangars
Apron Area:	64,200	Same
FBO/Operator:	Sussex County Georgetown Air Services	Same
Based Aircraft:	61	88
Aircraft operations:	34,500	49,700
Airspace:	G & E (E Begins at 700 AGL)	Same





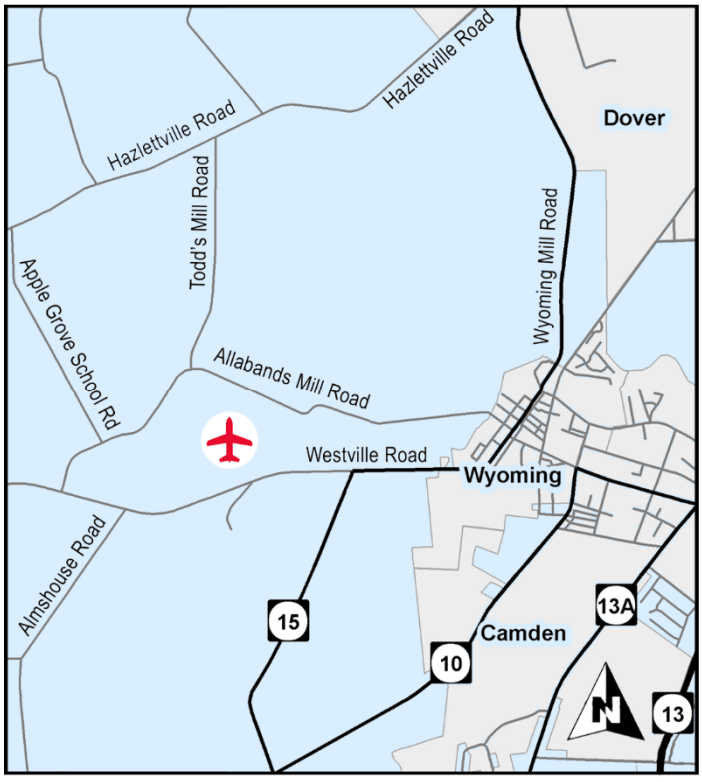
Jenkins Airport / 15N
Kent County / City of Wyoming

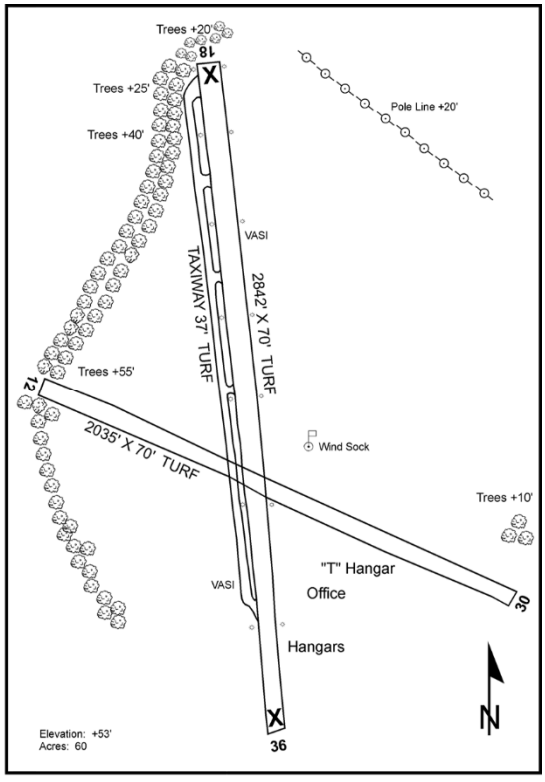
The Recommended Plan for Jenkins Airport has only one funding item - runway maintenance for Runway 12-30 (2,035 feet), which is the new designated primary runway. A significant change in the Airport's infrastructure occurred with the closing of Runway 18-36 (2,842 feet). The closure was made to accommodate the construction of a house on Runway end 18. This event has cast some doubt on the long-term viability of this Airport in the Delaware System.

Jenkins Airport / 15N

Kent County / City of Wyoming

Lat/Long:	39-07-02.4N / 075-35-03.9W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	Less than A-I	Same
Runway Information		
Orientation:	12-30	Same
Length:	2,035	Same
Width:	70	Same
Surface Type:	Turf	Same
Taxiway:	None	Same
Lighting:	None	Same
Visual Aids/Navaids:	None	Same
Services:		
Fuel available:	None	Same
Hangar Space:	21,500	Same
Apron Area:	None	Same
FBO/Operator:	Joe Jenkins	Same
Based Aircraft:	20	21
Aircraft operations:	500	600
Airspace:	G & E (E Begins at 700 AGL)	Same





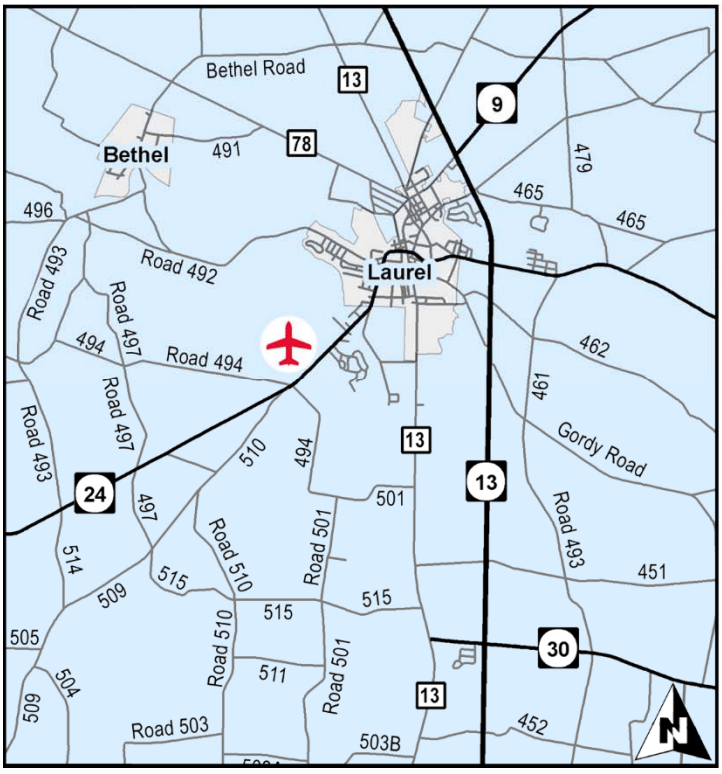
Laurel Airport / N06
Sussex County / City of Laurel

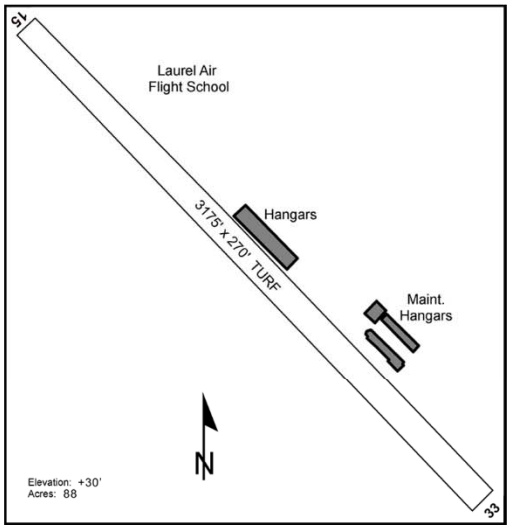
The Recommended Plan for Laurel Airport includes maintenance items and obstruction removal items that were not included in the Preferred Alternative. Working with the Airport owner, projects were identified for inclusion in the Capital Improvement Program. These included obstruction removal on the Runway 15 end (trees), runway seeding and repair, lighting and Navaids (PAPI), apron paving, hangar repair and some new hangar development. Under new management, the airport has dropped its skydiving operation and is focused on aerial spray operations and private aircraft storage.

Laurel Airport / N06

Sussex County / City of Laurel

Lat/Long:	38-32-31.864N 075-35-39.666W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	Less than A-I	Same
Runway Information		
Orientation:	15-33	Same
Length:	3,175	Same
Width:	270	Same
Surface Type:	Turf	Same
Taxiway:	None	Same
Lighting:	LIRL	Same
Visual Aids/Navaids:	None	PAPI
Services:		
Fuel available:	100 LL	Same
Hangar Space:	22,900	+4 T-Hangars
Apron Area:	1,900	Same
FBO/Operator:	Allen Chorman & Son, Inc.	Same
Based Aircraft:	14	19
Aircraft operations:	7,500	10,100
Airspace:	G & E (E Begins at 700 AGL)	Same



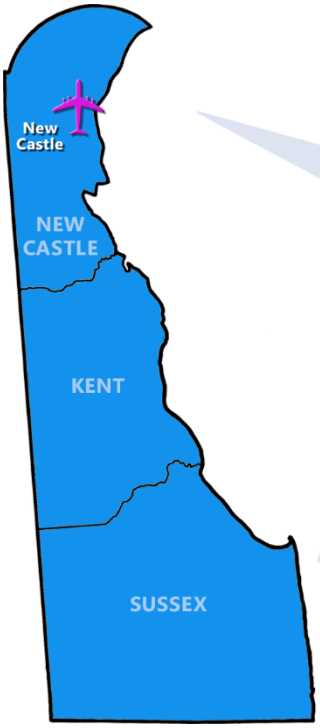


New Castle Airport / ILG
New Castle County / City of Wilmington

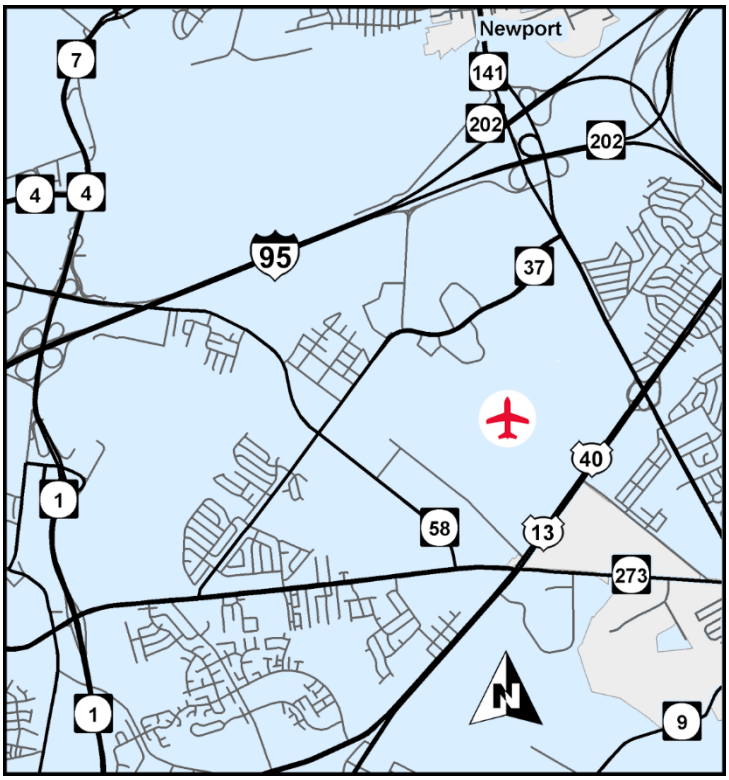
New Castle Airport retains the recommendations for facility needs shown in the Preferred Alternative (2). However, pavement overlays were added to cover all runways, taxiways, and apron area at some point during the planning period. While not adding facilities, this capital maintenance program significantly increases the costs associated with the Capital Improvement Program. Not included were any recommended facilities and costs associated with potential airline service. Those costs could also be significant if the service is successful.

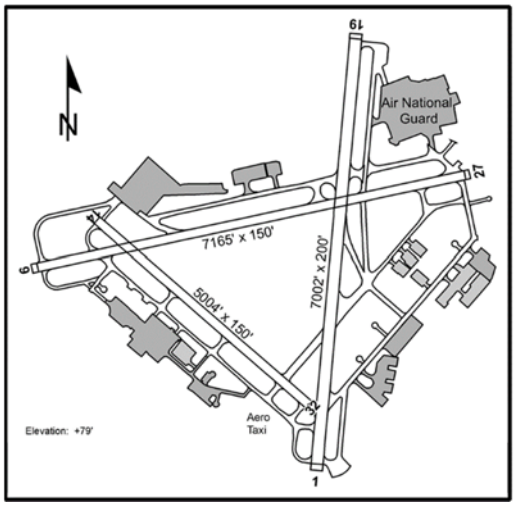
New Castle Airport / ILG

New Castle County / City of Wilmington



Lat/Long:	39-40-43.4N / 075-36-23.9W	
	Existing	**2040**
Role:	Public, Airline, GA	Same
ARC:	D-III	Same
Runway Information		
Orientation:	09-27/01-19/14-32	Same
Length:	7,275/7,012/4,602	Same
Width:	150/150/150	Same
Surface Type:	Asphalt	Same
Taxiway:	Full Parallel/Parallel/FP	Same
Lighting:	HIRL/HIRL/MIRL	Same
Visual Aids/Navaids:	PAPI-4, REIL/PAPI-4, REIL /VASI-4	Same
Services:		
Fuel available:	100LL & Jet-A	Same
Hangar Space:	865,300 SF	110,600
Apron Area:	233,000 SY	Same
FBO/Operator:	DRBA	New Castle County
Based Aircraft:	198	245
Aircraft operations:	41,582 Annually	50,300
Airspace:	Class D & B	Same
	D (Ground - 2,600' AGL), Class B (4,000-7,000 AGL)	



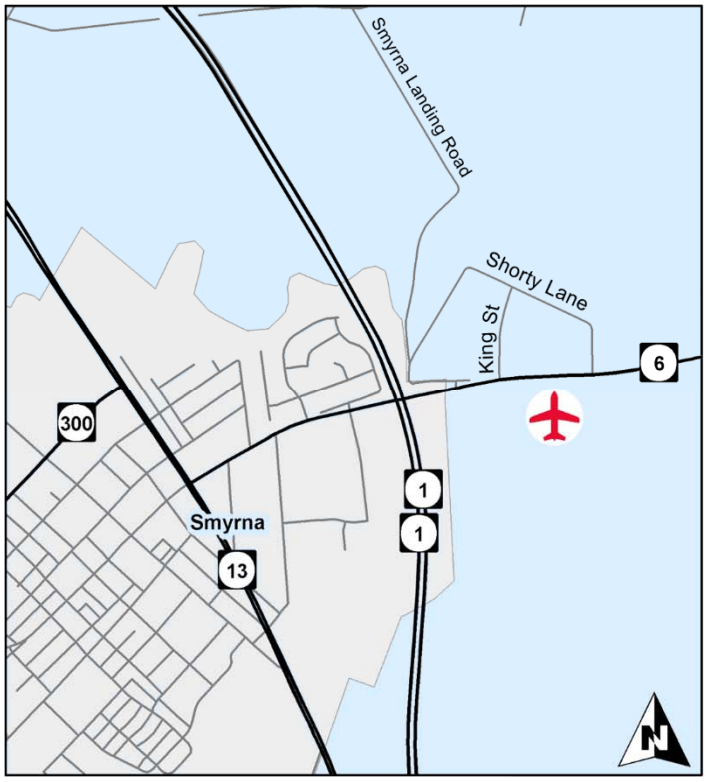


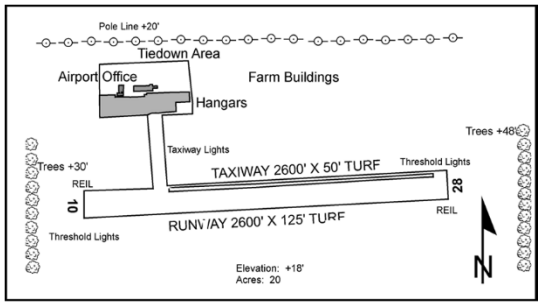
Smyrna Airport / 38N
Kent County / City of Smyrna

The Recommended Plan for Smyrna Airport has no new facility recommendations. Instead, the recommendations are for runway maintenance (seeding and rolling) and obstruction removal. Previous studies have identified tree obstructions on the east side (Runway end 28). As a privately owned facility, the Airport will continue to serve for flight training, glider operations, and occasional aerial spray operations. In addition, recreational and private pilot operations will continue.

Smyrna Airport / 38N
Kent County / City of Smyrna

Lat/Long:	39-18-13.2N / 075-35-01.7W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	Less than A-I	Same
Runway Information		
Orientation:	10-28	Same
Length:	2,600	Same
Width:	125	Same
Surface Type:	Turf	Same
Taxiway:	None	Same
Lighting:	LIRL	Same
Visual Aids/Navaids:	REIL	Same
Services:		
Fuel available:	None	Same
Hangar Space:	5,700	Same
Apron Area:	None	Same
FBO/Operator:	Robert Jones	Same
Based Aircraft:	10	11
Aircraft operations:	1,700	1,800
Airspace:	G & E (E Begins at 700 AGL)	Same



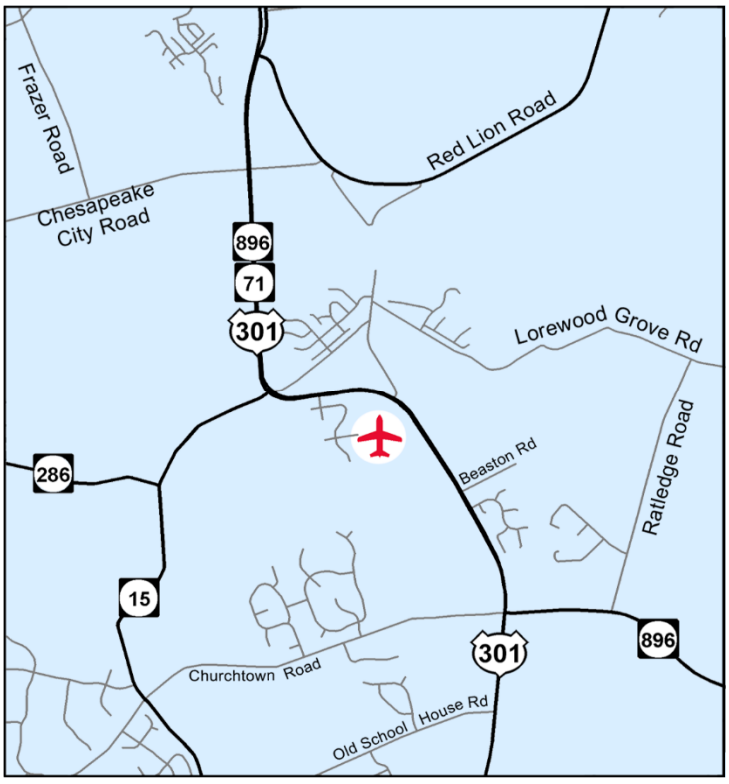


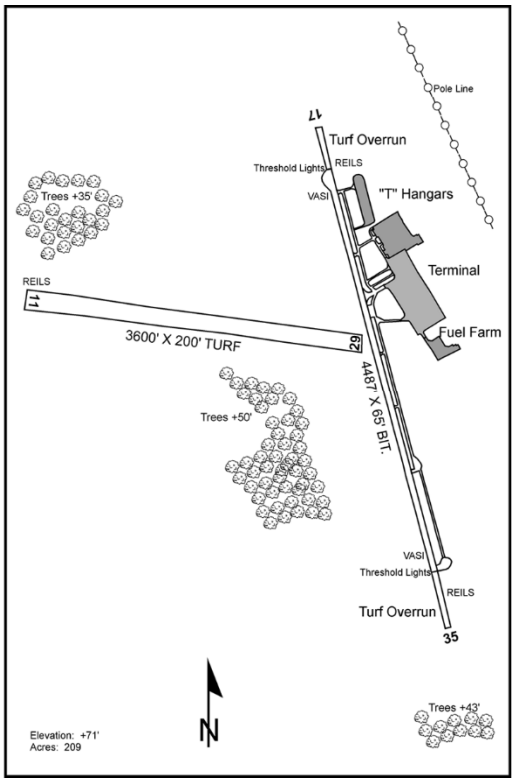
Summit Airport / EVY
New Castle County / City of Middletown

As a privately owned facility, Summit Airport is a major employer in the Middletown area, with more than 275 on-airport workers, according to a recent study. The Recommended Plan for Summit Airport includes a significant amount of potential infrastructure development, including a runway extension to 5,000 feet, taxiway paving, an Automated Weather Observation Station, pavement maintenance, obstruction removal, and some possible hangar development. If the runway were to be extended from 4,488 feet to 5,000 feet, the Runway Protection Zone (RPZ) would extend across Churchtown Road. It is possible that a relocation of a portion of that road around the RPZ border could be accomplished, thereby improving the safety of a potential runway extension. Roughly 7 acres of land acquisition would be needed for this.

Summit Airport / EVY
New Castle County / City of Middletown

Lat/Long:	39-31-15.7N / 075-43-25.2W	
	Existing	**2040**
Role:	Private, GA	Same
ARC:	B-I	B-II
Runway Information		
Orientation:	17-35	Same
Length:	4,488	5,000
Width:	65	65
Surface Type:	Asphalt	Same
Taxiway:	Full Parallel	Same
Lighting:	MIRL	Same
Visual Aids/Navaids:	PAPI-4, REIL	Same
Services:		
Fuel available:	100 LL, Jet-A	Same
Hangar Space:	140,900	Plus 5 T-Hangars, 3,200 sf C-hangars
Apron Area:	63,500	Same
FBO/Operator:	Summit Aviation	Same
Based Aircraft:	32	39
Aircraft operations:	32,000	39,000
Airspace:	G & E (E Begins at 700 AGL)	Same





Chapter 8

Implementation Plan

FINANCIAL & IMPLEMENTATION PLAN

THE PURPOSE OF THIS CHAPTER IS TO describe the financial plan along with the recommended methods, policies, and action steps necessary to implement the Recommended Aviation System. In addition, recommendations for other continuing aviation system planning are made as a part of this report. The chapter is organized to include the following sections:

- Financial Plan
  - Capital Improvement Program
  - Capital Funding Eligibility
  - Forecast of State Funding
- Implementation Plan
  - Priority Rating Process
  - Continuing Planning Process

Figure 8-1 – Delaware Airpark Based Aircraft

1. FINANCIAL PLAN

THE PURPOSE OF THE FINANCIAL PLAN IS to determine the costs and appropriate funding sources for the Recommended Aviation System Plan. To do this, information was used concerning the overall capital requirements, the eligibility status of each improvement project for Federal, State, local, and private funding, and the sources and amounts of anticipated funding availability.

It should be noted that the overall costs of the Recommended Plan are higher than any of the Alternatives. The reason for this is the inclusion of the runway extension at Delaware Airpark, pavement overlays at NPIAS airports, obstruction removals, and specific capital improvement projects for privately owned airports.

Even though the costs of the Recommended Plan are higher than the Alternatives, it should be noted that these costs are still considered minimum overall planning costs. Actual costs will certainly be higher for a number of reasons including:

- System Planning costs are planning level estimates and not design level estimates. Thus, they do not consider specific site-prep or construction materials requirements.
- System Planning costs do not consider new configurations of existing airfield or landside facilities other than those induced by demand. For example, if an airport needs airfield improvements because of declared distances on its runways, the System Plan would not have recognized the need through forecast demand estimates alone. Similarly, if an airport

has an entrance road, the System Plan does not include an analysis of whether that road requires physical relocation due to factors other than demand.

- System Planning costs are reliant on 20-year forecasts rather than annual Airport Capital Improvement Program (ACIP) estimates. Thus, they cannot react to market scenarios that require immediate capital investment, such as the initiation of new airline service, attraction of a new MRO, etc. System Planning cost estimates, therefore, are much less timely than the annual update of an airport's ACIP with the FAA.

For these reasons, the capital improvement program costs in Table 8-1 should be considered minimum requirements over the planning period. Discussed below are each of the components of the financial plan for the Recommended Aviation System.

1.1 CAPITAL IMPROVEMENT PROGRAM

Inputs to the Capital Improvement Program came from the work completed for the Alternatives Analysis, along with tailored recommendations for each airport. Also included are the capital maintenance costs of the publicly owned airports, such as pavement overlays of the runways, taxiways, and apron areas. With pavement life estimated at 20 years, every square yard of pavement will need to be overlaid within the planning period. In addition to these items, the projects identified by private airport owners and the consultants were included in the Recommended Plan costs.

The capital improvement program for the Recommended Aviation System has been identified by short (2020-2025), intermediate (2026-2030), and long range (2031-2040) system needs. These costs and improvements were staged with respect to the forecasted levels of system demand and capacity to bring all airports to their desired system standards in the appropriate time frame.

The total cost of developing the recommended system of airports in Delaware has been summarized for each airport by time period and eligible funding source and is presented in **Table 8-1**. The total cost in 2020 dollars for the 20-year (2020-2040) program is estimated at $79,762,800. As shown in **Table 8-1**, four sources of funds are expected to finance the development program. Projected financial needs from each of those sources are as follow:

Federal Funding:	$45,112,100
State Funding:	$10,452,400
Local Funding:	$1,865,800
Private Funding:	$22,332,500
TOTAL	$79,762,800

The calculation of these cost estimates relied upon a number of assumptions regarding Federally and State-eligible projects, and those funded through Local/Sponsor, and Private resources. **Table 8-1** presents a breakdown of costs by funding source and planning phase for each system airport.

As shown, State and Private funding at privately owned, public use airports is significant and higher than any previous State System Plan. The assumption of a permanent funding stream through a fuel tax and possibly a registration fee is key to DelDOT participation in the capital improvements at private airports.

If funding for only the privately owned airports is considered, it can be shown that State Funding totals $6,250,400, while the Private Funding match is $1,168,500. This is roughly 16 percent of the total, meaning that every dollar of private funding is leveraged by a factor greater than 6. Private Funding at publicly owned airports is $21,164,000, which assumes a significant amount of private investment at those airports. Not included in that total is any development of the Civil Air Terminal by private enterprise.

Table 8-1 - Airport Funding Eligibility

SASP Facility	2025	2030	2040	Total Costs
Chandelle Estates				
Federal	$0	$0	$0	$0
State	$90,000	$1,868,175	$565,685	$2,523,860
Local	$0	$0	$0	$0
Private	$10,000	$207,575	$109,965	$327,540
Total	$100,000	$2,075,750	$675,650	$2,851,400
Chorman Airport				
Federal	$0	$0	$0	$0
State	$90,000	$493,000	$1,448,748	$2,031,748
Local	$0	$0	$0	$0
Private	$10,000	$413,000	$160,972	$583,972
Total	$100,000	$906,000	$1,609,720	$2,615,720
Civil Air Terminal/Dover AFB				
Federal	$0	$0	$0	$0
State	$924,390	$0	$0	$924,390
Local	$102,710	$0	$0	$102,710
Private	$0	$0	$0	$0
Total	$1,027,100	$0	$0	$1,027,100
Delaware Airpark				
Federal	$0	$0	$13,375,845	$13,375,845
State	$0	$0	$1,514,555	$1,514,555
Local	$0	$0	$0	$0
Private	$624,000	$624,000	$962,000	$2,210,000

Table 8-1 - Airport Funding Eligibility				
SASP Facility	**2025**	**2030**	**2040**	**Total Costs**
Total	$624,000	$624,000	$15,852,400	$17,100,400
Delaware Coastal				
Federal	$224,710	$0	$6,790,097	$7,014,807
State	$12,484	$0	$377,228	$389,712
Local	$12,484	$0	$377,228	$389,712
Private	$1,742,000	$0	$2,834,000	$4,576,000
Total	$1,991,678	$0	$10,378,553	$12,370,231
Jenkins Airport				
Federal	$0	$0	$0	$0
State	$9,000	$9,000	$18,000	$36,000
Local	$0	$0	$0	$0
Private	$1,000	$1,000	$2,000	$4,000
Total	$10,000	$10,000	$20,000	$40,000
Laurel Airport				
Federal	$0	$0	$0	$0
State	$249,045	$135,000	$156,000	$540,045
Local	$0	$0	$0	$0
Private	$65,005	$15,000	$156,000	$236,005
Total	$314,050	$150,000	$312,000	$776,050
New Castle Airport				
Federal	$0	$12,360,721	$12,360,721	$24,721,442
State	$0	$686,707	$686,707	$1,373,414
Local	$0	$686,707	$686,707	$1,373,414
Private	$3,874,000	$3,354,000	$7,150,000	$14,378,000
Total	$3,874,000	$17,088,135	$20,884,135	$41,846,270
Smyrna Airport				
Federal	$0	$0	$0	$0
State	$9,000	$9,000	$18,000	$36,000
Local	$0	$0	$0	$0
Private	$1,000	$1,000	$2,000	$4,000
Total	$10,000	$10,000	$20,000	$40,000
Summit Airport				
Federal	$0	$0	$0	$0
State	$247,500	$736,200	$18,000	$1,001,700
Local	$0	$0	$0	$0
Private	$1,000	$1,000	$2,000	$4,000
Total				
Total SASP Funding Sources*				
Federal	**$224,700**	**$12,360,700**	**$32,526,700**	**$45,112,100**

Table 8-1 - Airport Funding Eligibility				
SASP Facility	**2025**	**2030**	**2040**	**Total Costs**
State	**$1,586,400**	**$3,847,100**	**$4,721,900**	**$10,452,400**
Local	**$115,200**	**$686,700**	**$1,063,900**	**$1,865,800**
Private	**$6,323,000**	**$4,606,600**	**$11,369,900**	**$22,332,500**
Total	**$8,249,300**	**$21,501,100**	**$49,682,400**	**$79,762,800**

* Rounded to the nearest 100.

1.2 CAPITAL FUNDING ELIGIBILITY

Projects that are eligible for capital funding differ by funding source. There are four primary sources of funds listed in Section 1.1 – Federal, State, Local, and Private. The eligibility of projects for funding are described in the following subsections.

Federal Funding

Eligible projects include those improvements related to enhancing airport safety, capacity, security, and environmental concerns. In general, sponsors can get Airport Improvement Program (AIP) funds for most airfield capital improvements or rehabilitation projects and in some specific situations, for terminals, hangars, and nonaviation development. Certain professional services that are necessary for eligible projects (such as planning, surveying, and design) can also be eligible. The FAA must be able to determine that the projects are justified based on civil aeronautical demand. The projects must also meet Federal environmental and procurement requirements.

Projects related to revenue producing facilities may be eligible at non-primary airports if the airport has already satisfactorily addressed all airside needs and the improvement will increase revenue for the airport. Projects related to airport operations are not eligible for funding. Operational costs - such as salaries, equipment, and supplies - are also not eligible for AIP grants.

FAA funding levels for eligible projects at publicly owned general aviation airports in Delaware are 90 percent, with an airport match of 10 percent. A temporary change during the COVID-19 crisis allowed a 100 percent grant from FAA. However, that is believed to be temporary. Under normal conditions, DelDOT provides a 5 percent reimbursement towards the airport share of federally-eligible AIP projects.

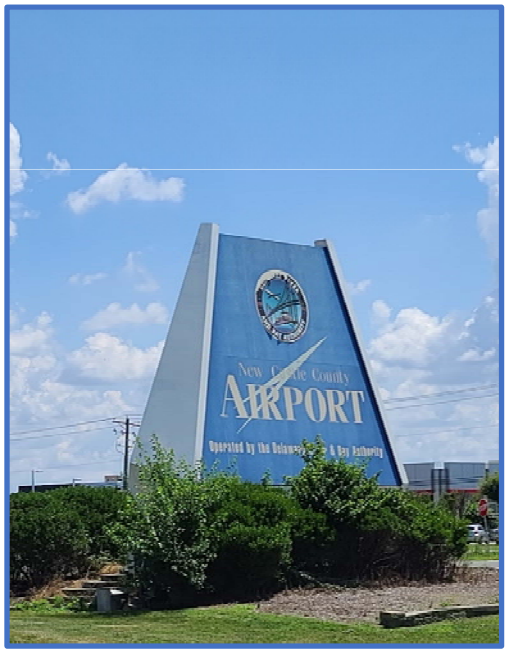


Figure 8-2 – New Castle Airport Entrance

State Funding

For the first time in recent history, the State of Delaware has made the funding of privately owned, public-use airports in the State System Plan eligible for significant capital projects. In general, the same projects that are eligible for Federal funding are eligible for State funding at privately owned system airports.

State participation in non-revenue generating projects is 90 percent, with a 10 percent match from the private airport sponsor. For eligible revenue-producing projects, the State share is 50 percent. Every State grant includes a sponsor assurance that the airport will remain open as an airport for a minimum of 10 years. **Appendix 8-A** presents the suggested wording for a State grant assurance from a private airport sponsor. There is no retroactive funding for State projects at privately owned airports. That is, grants must be authorized and current in order to receive reimbursement.

For publicly-owned system airports, the State is in the process of implementing a Routine Airport Maintenance Project (RAMP) matching grant of up to $50,000 per year ($100,000 total project). This grant program matches the sponsors' funding at 50/50 percent. It is meant to cover items not eligible for FAA grants, but can be used for any maintenance or improvement project (FAA eligible or not eligible).

Local/Private Funding

Airport sponsors of publicly and privately owned public-use airports must contribute between 5 and 50 percent funding for Federal or State eligible projects. At the low end, a publicly owned airport with State matching funds on a Federally eligible project must contribute 5 percent of the total. At the high end, a privately owned system airport with an eligible revenue-producing project must contribute 50 percent of the total. For non-eligible projects, these sponsors must pay 100 percent of the cost. In some cases, projects may be eligible, but because there is a lack of funding, they may have to pay 100 percent due to an immediate need of the facility.

1.3 FORECAST OF STATE FUNDING CAPABILITY

This section provides a forecast of State Funding capability, based upon the projected sale of jet fuel over the next 20 years. In addition, a supplemental projection was made for potential aircraft registration fees, if that law should be passed. Currently, there is a $0.05 per gallon tax on jet fuel that was recently added via legislation. All of the proceeds of this tax are to be spent on the aviation system.

For this analysis, two potential fuel sales revenue scenarios were forecast, along with a possible aircraft registration fee projection. One of the fuel sales revenue scenarios involved the status quo,

where the existing tax is projected using the forecast of business aircraft (turbine using jet fuel) activity for the future. The second scenario adds potential airline service at New Castle Airport to the mix. **Table 8-2** presents the status quo scenario, while **Table 8-3** shows the added airline service option.

Table 8-2 - Baseline Fuel Tax Forecast

Item	**Actual**	**Forecast**		
Year	**2018**	**2025**	**2030**	**2040**
Delaware Total Based Jets	71	79	87	103
Total Fuel Sales*	4,405,235	5,113,038	5,630,814	6,666,366
Potential Fuel Tax		$255,652	$281,541	$333,318

* Excluding Chorman Airport Spray Operations, which are exempt.

Under the Baseline Fuel Tax Forecast, the cumulative total from 2019 through 2040 is $6,139,500. This could be considered the low end of possible revenues generated for State aeronautical funding purposes.

Table 8-3 - Fuel Tax Forecast with Airline Service

	Actual	**Forecast**		
Year	**2018**	**2025**	**2030**	**2040**
Delaware Total Based Jets	71	79	87	103
Fuel Sales*	4,405,235	5,113,038	5,630,814	6,666,366
Airline Fuel Sales	-	6,000,000	7,000,000	9,000,000
Total Fuel Sales	4,405,235	11,113,038	12,630,814	15,666,366
Potential Fuel Tax		$555,652	$631,541	$783,318

* Excluding Chorman Airport Spray Operations, which are exempt.

Under the Fuel Tax Forecast with Airline Service, the cumulative total from 2019 through 2040 is $13,039,500. This could be considered the intermediate level of possible revenues generated by fuel sales for State aeronautical funding purposes.

A third scenario involves the generation of revenues through a registered aircraft fee system. Pending legislation would impose a graduated fee for aircraft registered in the State of Delaware, but not based there (out of state registrations). The fee schedule shows the lowest rates for single engine aircraft, increasing for multi-engine and jet aircraft. **Table 8-4** presents a summary of potential revenues from this source of funds.

Table 8-4 - Estimation of Potential Registration Fees: 2020

Item	Single Engine	Multi-Engine	Turbojet	Rotor	Other	Totals
FAA Registrations	6,134	1,680	2,009	822	149	10,794
Registration Codes that are categorized as Valid	**5,545**	**1,509**	**1,822**	**746**	**136**	**9,758**

Table 8-4 - Estimation of Potential Registration Fees: 2020						
Item	Single Engine	Multi-Engine	Turbojet	Rotor	Other	Totals
DE Based Aircraft	-342	-54	-79	-19	-14	-508
Aircraft Subject to Tax	5,203	1,455	1,743	727	122	9,250
Registration Unit Fees	$25	$50	$250	$50	$10	
Potential Fees	**$130,075**	**$72,750**	**$435,750**	**$36,350**	**$1,220**	**$676,145**

These fees are assumed to remain constant over the planning period, as they are not representative of normal aviation demand factors. Instead, they are based upon corporate filings and activity in the State of Delaware. Assuming a collection rate of about 75 percent, this would add about $500,000 per year to the previous estimates of fuel tax revenues. For an 18-year period of collection (implementation in 2022), a total of $9 million could be added to the $6.1 million or $13.0 million fuel revenue scenarios.

The amount of money available to fund the State aviation grant program will rest in part on these revenue sources. As shown, there is a potential range of between $6.1 million and $22.0 million available over the next 20 years. This amount compared to the need for $10.5 million (**Table 8-1**) shows that something greater than the minimum projection of revenues is needed to ensure implementation of the Recommended Aviation System Plan.

2. IMPLEMENTATION PLAN

THE IMPLEMENTATION PLAN PRESENTS THE STRATEGIES TO be used in administering the grants and continuous planning associated with the Recommended Aviation System. In this regard, a Priority Rating Process has been developed that applies to privately owned, public-use airports in the system. These airports will be competing for State Funding and must be ranked in order of overall importance to the system. In addition, a Continuing Planning Process is outlined for use by the State in the maintenance of its aviation system.

2.1 PRIORITY RATING PROCESS

Given the new revenue program which enables DelDOT to fund projects at all qualifying public-use airports in the State, a process has been developed to help prioritize funding allocations to these airports. This process balances the needs to maintain and enhance safety while providing economically viable development initiatives.

The State funding program has been developed to allocate an annual matching fund (up to $50,000, for a project total of $100,000), for routine maintenance projects at the publicly owned NPIAS Airports (New Castle, Delaware Coastal, and Delaware Airpark). The remainder of the State funding is being made available to the privately-owned, public-use airports (an the Civil Air

Terminal). These airports must compete for funding, based in part, upon their score in this priority rating process.

For non-revenue producing infrastructure projects such as runways and taxiways, apron areas, perimeter fencing, entrance roads, and so forth, the local matching portion is 10 percent of the State grant – similar to the FAA local share matching amounts (90%-10%). For revenue producing projects, the local matching share increases to 50 percent, which recognizes the future return on that investment. The larger matching percentage (50%-50%) also ensures that revenue producing projects will make business sense and avoid the "if you build it, they will come" philosophy. In essence, the private project sponsor is asked to share the risk on an equal basis with the State.

In all, there are seven relevant rating factors and a 100-point scale used to determine the priority ranking of individual airport projects. The Project Ranking Factor is a coefficient (non-local) that is multiplied times the sum of the other factors which are localized to the specific airport. The relative weights of the local factors are shown by the number of points allocated to each factor. These included:

	Points
Non-Local Factors	
• Project Ranking Coefficients	Coefficient x Sum of Points
Local Factors	
• Economic Impact Scale	20
• Business Aviation Capability	20
• Airport System Role	10
• Airport Activity	10
• Conformity to FAA Standards	10
• Service Area Population	10
• Project Critical to Airport Viability	20
• TOTALS	100

Figure 8-3 – T-Hangars at Delaware Airpark

Unlike previous ranking systems, airport capacity was not included because it was shown in Phase 1 of the System Plan that all the public-use airports have significant capacity surpluses that will not be approached during the planning period. System-wide, only 23 percent of the airfield capacity available at the State's public use airports will be used by the year 2040. In addition, another factor was added to account for projects that are critical to an airport's viability. This added set of points may be the difference between airport success and failure. The following sections discuss each of the rating factors used in this model.

Project Ranking Coefficients

Individual airport projects were ranked among themselves based upon their impacts on safety and airport economic viability. The overall philosophy was to first ensure the physical infrastructure soundness and then consider revenue enhancement projects. In some cases, a single project could accomplish both goals. The priority coefficient factors are non-local. That is, they are not impacted by local population, economic impacts, individual airport operations, and so on. Instead, they represent project priorities in rank order of their ability to improve safety and airport economic viability at Delaware privately-owned, public-use airports. **Table 8-5** presents a listing of projects and their relative priority ranking coefficients.

Table 8-5 – Project Ranking Coefficients

Improvement Project	Priority Coefficient
Runway Extension	1.0
Pave/Light Runway	0.95
Runway Pavement Overlay/Crack Sealing	0.95
Pave/Light Taxiway	0.90
Taxiway Overlay	0.90
Aircraft Apron Paving	0.85
Apron Overlay	0.85
Obstruction Removal	0.80
Navaids	0.75
Fuel System	0.75
Terminal Building	0.70
Perimeter Fencing	0.65
Hangar Construction	0.60
Access Road	0.60
Pave Auto Parking	0.50

Runway extensions add to the viability of airport by permitting larger aircraft to use the facility. For the future, this is a strategic factor that recognizes the loss of single engine aircraft and the increase in larger business-type aircraft. These are infrastructure improvements that do not have direct revenue producing capabilities.

Moving down the list, the maintenance of the airfield system (runways, taxiways, aprons) is also critical to providing airport services on a long-term basis. Similarly, the removal of obstructions and provision of navaids increases the safety of airport operations. Once these improvements have been made, revenue producing projects are next in priority.

Revenue producing improvements include the development of fueling systems and hangar construction. Also down on the priority list are the development increased terminal building space,

perimeter fencing, access roads, and finally auto parking lots.

Economic Impact Scale

To help maximize the economic impact of State funding expenditures, this factor was included in the ranking process. It involves the economic impact of an airport per aircraft operation. For this metric, the total economic output of an airport is divided by the number of aircraft operations. This factor helps quantify the importance of an airport on a relative basis. For example, with only 200 operations and $2.0 million in impacts, the Civil Air Terminal produces $10,010 per operation. Summit Airport, on the other hand, has an economic impact of $65.6 million and 31,535 operations for an economic impact factor of $2,081 per aircraft operation. **Table 8-6** shows the economic impact factors for each airport.

Table 8-6 – Economic Impact Scale

Airport	Economic Impact	Aircraft Operations	$/Operation	Economic Factor	Points Score
Chandelle Estates	$304,600	1,100	$277	3%	2
Chorman Airport	$2,303,700	13,500	$171	2%	2
Civil Air Terminal	$2,001,900	200	$10,010	100%	20
Jenkins Airport	$89,600	500	$179	2%	2
Laurel Airport	$1,203,300	7,500	$160	2%	2
Smyrna Airport	$197,100	1,700	$116	1%	2
Summit Airport	$65,615,700	32,000	$2,050	20%	4

Scoring for this factor used the highest economic impact factor per operation as indexed to 1, while all the other ratios were fractions/percentages of that impact factor. On a 20-point scale, these scores translate into the points shown in the far-right column of **Table 8-6**.

Business Aviation Compatibility

Delaware System Airports were scored relative to their accommodation of business aviation. National forecasts by the FAA show that business aviation has a much brighter future than most other general aviation use. In addition, business aviation accounts for a proportionately higher share of airport revenues than smaller general aviation aircraft. This is due to the higher usage of business aviation and the larger, more sophisticated aircraft being used. For example, the

Figure 8-4 – Corporate Hangars at New Castle Airport

average fuel upload for business jets in 2019 was 610 gallons.[1] This can be compared to the average 30-gallon purchase of a small, single-engine propeller aircraft.

Therefore, if an airport is able to accommodate business jets, it should receive a higher score in this category than airports with short, low-load limit pavements. In addition, the number of jets or multi-engine propeller aircraft based at the airport should be used as a factor in the rating process. Scoring includes the following primary criteria:

- ***Based Business Aircraft and Itinerant Operations:*** The number of business type aircraft (jet and multi-engine) currently based at the airport as well as the number of itinerant operations were used as direct inputs into the model. Scoring was based on a ten-point scale, with Chorman Airport and Chandelle Estates sharing the highest score, having two multi-engine aircraft each. Fractional percentages of these point scores were used for the other system airports, based upon their comparative percentage of the highest business activity.
- ***Runway Length/Strength:*** Runways and taxiway systems that can accommodate business aviation are important in this rating factor because based business jets and multi-engine aircraft totals do not provide the entire picture. Airports that have the capacity to accommodate business activity can show itinerant usage, even if those business aircraft are not based at the facility. For jet activity, runways lengths of more than 5,000 feet are important. For multi-engine business aviation, runways with 3,200 feet or more are important (4,200 feet is the minimum length required for precision instrument approach development). Obviously, turf runways do not score points within this criterion. Scores for Runway Length/Strength used a ten-point basis, as shown in **Table 8-7**.

Table 8-7 presents a summary of the Business Aviation Compatibility scoring.

Table 8-7 - Business Aviation Compatibility Scoring

Airport	Based Jets + Multi-Engine	Aircraft Score	Primary Runway Length	Runway Score	Total Score
Chandelle Estates	2	10	2,533	0	10
Chorman Airport	2	10	3,588	6	16
Civil Air Terminal	-	-	12,903	10	10
Jenkins Airport	1	5	N/A	0	5
Laurel Airport	1	5	N/A	0	5
Smyrna Airport	-	-	N/A	0	-
Summit Airport	-	-	4,488	8	8

[1] Source: Federal Aviation Administration Business Jet Report: December 2019 Issue. Accessed on 2/14/2020: https://aspm.faa.gov/apmd/sys/bjpdf/b-jet-201912.pdf, and Table 31 of FAA Aerospace Forecasts – 2019-2039.

Airport System Role

The classification of airport type (jet-capable, single-engine, etc.) indicates the service level available at that location. For the purposes of this study, points were awarded based upon a scale similar to the one used by the FAA's National Plan of Integrated Airport Systems (NPIAS). The FAA definitions of each role include:

- ***National Airports:*** National airports are located in metropolitan areas near major business centers and support flying throughout the Nation and the world. These airports provide pilots with attractive alternatives to the busy primary airports. In fact, the FAA has designated 70 of these facilities as relievers for primary airports. National airports have very high levels of activity with many jets and multiengine propeller aircraft.
- ***Regional Airports:*** Regional airports are also in metropolitan areas and serve relatively large populations. These airports support regional economies with interstate and some long-distance flying and have high levels of activity, including some jets and multiengine propeller aircraft. The only Regional airport in Delaware is Delaware Coastal – not a privately owned airport.
- ***Local Airports:*** Local airports are a critical component of the nation's general aviation system, providing communities with access to local and regional markets. Typically, local airports are located near larger population centers but not necessarily in metropolitan areas. They also accommodate flight training and emergency services. These airports account for 39 percent of all NPIAS airports and have moderate levels of activity with some multiengine propeller aircraft.
- ***Basic Airports:*** Basic airports fulfill the principal role of a community airport providing a means for private general aviation flying, linking the community with the national airport system, and making other unique contributions. In some instances, the airport is the only way to access the community and provides emergency response access, such as emergency medical or firefighting and mail delivery. These airports have moderate levels of activity with an average of nine propeller-driven aircraft and no jets. Many of these airports are located in rural areas.
- ***Unclassified Airports:*** These airports tend to have limited activity and include public- and private-owned airports.

To integrate the concept of airport role into the priority rating process, points were awarded as follows:

Airport Role	Point Score
National	10
Regional	8
Local/Unclassified	6
Basic/Unclassified	4

For purposes of this analysis, non-NPIAS airports were scored as Basic facilities, except for Chorman Airport, which was scored as a Local airport. Although the Civil Air Terminal is not technically an airport, it enjoys access to Dover Air Force Base and can serve a National clientele. Finally, Summit Airport's role is listed as "Unclassified" in the NPIAS. In this study, its role is that of a Local airport. **Table 8-8** lists the Delaware airports and their Airport System Role scores.

Table 8-8 – Airport System Role Scores

Airport	System Role	Priority Ranking Score
Chandelle Estates	Basic	4
Chorman Airport	Local	6
Civil Air Terminal	National	10
Jenkins Airport	Basic	4
Laurel Airport	Basic	4
Smyrna Airport	Basic	4
Summit Airport	Local	6

Airport Activity

Because operational activity is one gauge of utility and service, the higher number of operations, the more people are being served by the airport. This factor is an important consideration when funding projects with State money. **Table 8-9** presents the activity levels for each of the privately owned system airports and shows the rating scale used.

Table 8-9 – Airport Activity Factor Scores

Airport	Total Ops	% of Highest	Aircraft Score
Chandelle Estates	1,300	4%	1
Chorman Airport	14,600	46%	5
Civil Air Terminal	200	1%	1
Jenkins Airport	500	2%	1
Laurel Airport	7,500	23%	2
Smyrna Airport	1,700	5%	1
Summit Airport	32,000	100%	10

Conformity to FAA Airfield Standards

If a project will bring an airport airfield up to an FAA standard, it should receive priority consideration for funding. Most FAA standards are meant to improve safety and as such are ranked highest in the FAA's priority rating model. In the case of Delaware airports, FAA standards that may require correction often involve runway or taxiway non-conforming dimensional or load-bearing capacity. This could even impact runway lengthening if the critical aircraft is not being served by the current length. In some cases, obstructions to air navigation create issues at privately

owned airports. Correction of these issues were given priority in ranking, by weighting the project score.

Figure 8-5 - Runway Signage at Delaware Coastal

No points were given for landside development unless they helped in some way with the FAA airfield standards. While some airport projects may improve safety or utility, if they don't actually bring the airport into conformance with FAA standards for that project area, they would not receive points from this criterion. For example, a taxiway overlay project may have centerline separation issues with the runway. If this is not corrected, no points would be given for this scoring factor. The weighting is a simple "Yes/No" with 10 points given for Yes and zero points given for No.

Service Area Population

The prudent use of State funding seeks to benefit the greatest number of people with each expenditure. This favors the use of airport grants in high population areas. In airport system planning, use of a 20-mile radius or 30-minute drive time areas is typical to determine the service area population. For this reason, the population of each airport's county was deemed a reasonable estimate for its service area population, with two exceptions. For Summit Airport, an average of New Castle and Kent County population was used. For Chorman Airport, located in southern Kent County, an average of Kent and Sussex County population was used.

These figures were gathered from the most recent estimates of the local population. Scoring of this factor used the largest population base (New Castle County) as the denominator, with each of the other airport service area populations as the numerator. Thus, a fraction was used with the airport role score to determine the overall regional airport resource factor score. **Table 8-10** shows the service area population factors for each airport, along with the associated 10-point scale score.

Table 8-10 – Service Area Population Factors

Airport	Population Base	Population Factor	Points Score
Chandelle Estates	178,550	48%	5
Chorman Airport	203,918	55%	6
Civil Air Terminal	178,550	48%	5
Jenkins Airport	178,550	48%	5
Laurel Airport	229,286	62%	6
Smyrna Airport	178,550	48%	5
Summit Airport	368,943	100%	10

Project Critical to Airport Viability

The final set of points available to airports for projects that may be critical to their viability involves a 20-point yes/no decision. These points are for emergency projects that serve to keep an airport viable. For example, if a runway is failing and would require the airport to close until it could be fixed, this project would qualify for points in this category. Some degree of latitude is provided, in order to give decision makers leeway to ensure that the Delaware airport system is preserved.

The 20 points are automatically given a Project Ranking Coefficient of 1.0, even if the project in question has a lower coefficient. In practice, this means that the points are not subject to the Project Ranking Coefficients because of the critical nature of the project to the airport.

Summary and Example Projects

To understand how the State priority rating process works, three fictional projects were created for ranking purposes. The three projects included:

- Runway Extension at Chorman Airport
- Hangar Development at Summit Airport
- Entrance Road at Laurel Airport

Table 8-11 shows how the ranking process would work. For this process, the Project Ranking Coefficient is multiplied times the sum of the other factors.

Table 8-11 – Example Priority Rating Projects

Ranking Criteria	Chorman - Runway Extension	Summit - Hangar Development	Laurel – Entrance Road
Project Rank	1.00	0.60	0.60
Economic Impact	2	4	2
Business Aviation	16	8	5
System Role	6	6	4
Airport Activity	5	10	3
FAA Standards	0	0	0
Service Area Population	6	10	6
Critical Project	0	0	0
Ranking Score	**35**	**23**	**12**

As shown, the runway extension at Chorman ranks first with a score of 35 (35 times 1.00), even though many of the local ranking factor are less than or equal to those for Summit Airport. The high scores at Summit Airport are dampened by the overall project ranking coefficient associated with hangar development. The score of 23 ranks second in this mix. The entrance road project at Laurel Airport ranks a distant third, with a 12, behind the others due to the project's low-ranking

coefficient and the fact that the development of hangars would not help achieve any FAA airfield standard.

In all, the ranking process makes intuitive sense. That is, a revenue producing project should score lower than a runway project, particularly if both airports have a Local role. The entrance road at Laurel Airport scores lower than either of the projects at the other airports due to a combination of factors – the airport system role, aviation activity, business use, and so on.

Notice that no points were given to any airport for the Project Critical to Airport Viability category. This category is not to be used unless there is an actual emergency or critical issue facing an airport. Also, the 20 points are not subject to the Project Ranking Coefficients because of the critical nature of this ranking factor. Using the fictional example above, the 20 points could move the Laurel entrance road into second place. It could also move the hangar project at Summit Airport ahead of the runway project at Chorman.

Figure 8-6 – Chorman Entrance Sign

Comparison with FAA Priority Model[2]

The FAA uses a numerical system as one tool for prioritizing airport development. The values generated by the National Priority System (NPS) equation serve only to categorize airport development in accordance with agency goals and objectives. The NPS equation generates values between 0 and 100 with 100 generally being most consistent with agency goals. NPS equation:

National Priority Rating = (k5*P)*[(k1*A)+(k2*P)+(k3*C)+(k4*T)]

Where: k1 = 1.00 k2 = 1.40 k3 = 1.00 k4 = 1.20 k5 = 0.25

National Priority Rating = .25P*(A+1.4P+C+1.2T)

[2] Source: FAA Order 5100.39A - *Airports Capital Improvement Plan.*

Applying the above equation produces a numerical value between 0 and 100 depending upon the associated values for A, P, C and T. In general, projects with higher numerical values are most consistent with FAA goals and objectives. It is anticipated that, based on future experience, the individual point values and equation coefficients (k1-k5) may be adjusted slightly to reflect modified national goals. **Figures 8-7** and **8-8** provide references to associate specific work descriptions with work codes and national priority ratings, and for each airport code when associated with the work codes. The purpose code (P) is used twice within the equation to signify added importance.

- ***Airport Code:*** The airport code (A) is used to identify the role and size of the airport. To provide sufficient variability to the airport size factor, the airport code is assigned a value that ranges between 2 and 5.
- ***ACIP Project Codes:*** A project work code is a 6-character alpha identifier consisting of three 2-character elements that express purpose, component and type. The project work code represents specific airport development and is used in the national priority system equation to produce a numerical rating. Each 2-character alpha identifier may be assigned a value ranging from 0 to 10.
- ***Purpose Points:*** The purpose (P) identifier signifies the underlying objective of an airport development project (e.g., reconstruction). There are 8 purpose identifiers.
- ***Component Points:*** The component (C) identifier signifies the physical component (e.g., runway), for which the development is intended. There are 17 component identifiers.
- ***Type Points:*** The type (T) identifier signifies the actual work being done (e.g., extension). There are 38 type identifiers.

5100.39A
Appendix 5

Point Values for AIP Airport and ACIP Work Codes

A = Airport Code (2 to 5 pts.):

Primary Commercial Service Airports

A -	Large and Medium Hub	= 5 pts
B -	Small and Non Hub	= 4 pts

Non Primary Commercial Service, Reliever, and General Aviation Airports

	Based Aircraft/Itinerant Operations	
A -	100 or 50,000	= 5 pts
B -	50 or 20,000	= 4 pts
C -	20 or 8,000	= 3 pts
D -	<20 and <8,000	= 2 pts

P = Purpose Points (0 to 10 pts)

CA = Capacity = 7pts
EN = Environment = 8pts
OT = Other = 4pts
PL = Planning = 8pts
RE = Reconstruction = 8pts
SA = Safety/Security = 10pts
SP = Statutory Emphasis Programs = 9pts
ST = Standards = 6pts

C =Component Points (0 to 10 pts)

AP = Apron = 5pts
BD = Building = 3pts
EQ = Equipment = 8pts
FI = Financing = 0pts
GT = Ground Transportation = 4pts
HE = Helipad = 9pts
HO = Homes = 7pts
LA = Land = 7pts
NA = New Airport = 4pts
OT = Other = 7pts
PB = Public Building = 7pts
PL = Planning = 7pts
RW = Runway = 10pts
SB = Seaplane = 9pts
TE = Terminal = 1pt
TW = Taxiway = 8pts
VT = Vertiport = 4pts

T = Type Points (0 to 10 pts)

60 = Outside 65 DNL = 0pts
65 = 65 - 69 DNL = 4pts
70 = 70 - 74 DNL = 7pts
75 = Inside 75 DNL = 10pts
AC = Access = 7pts
AD = Administration Costs = 0pts
AQ = Acquire Airport = 5pts
BO = Bond Retirement = 0pts
CO = Construction = 10pts
DI = De-Icing Facilities = 6pts
DV = Development Land = 6pts
EX = Extension/Expansion = 6pts
FF = Fuel Farm Development = 2pts
FR = RW Friction = 9pts
IM = Improvements = 8pts
IN = Instrument Approach Aid = 7pts
LI = Lighting = 8pts
MA = Master Plan = 9pts
ME = Metropolitan Planning = 7pts
MS = Miscellaneous = 5pts
MT = Mitigation = 6pts
NO = Noise Plan/Suppression = 7pts
OB = Obstruction Removal = 10pts
PA = Parking = 1pt
PM = People Mover = 3pts
RF = ARFF Vehicle = 10pts
RL = Rail = 3pts
SE = Security Improvement = 6pts
SF = RW Safety Area = 8pts
SG = RW/TW Signs = 9pts
SN = Snow Removal Equipment = 9pts
SR = Sensors = 8pts
ST = State Planning = 8pts
SV = Service = 6pts
SZ = Safety Zone (RPZ) = 8pts
VI = Visual Approach Aids. Aid = 8pts
VT = Construct V/Tol RW/Vert Plan = 2pts
WX = Weather Reporting Equipment = 8pts

Figure 8-7 - Legend for Figure 8-8

NPIAS-ACIP Standard Descriptions, ACIP Codes, and National Priority Ratings

5100.39A
Appendix 6

	ACIP Codes			Airport Code			
PROJECT DESCRIPTION	Purpose	Component	Type	A	B	C	D
				5	4	3	2
APRON							
Construct {name} Apron	CA	AP	CO	56	54	52	50
Expand {name} Apron	CA	AP	EX	47	46	44	42
Construct {name} Apron (environmental mitigation)	EN	AP	CO	66	64	62	60
Rehabilitate {name} Apron	RE	AP	IM	62	60	58	56
Construct {name} Apron	ST	AP	CO	46	44	43	41
Expand/Strengthen {name} Apron	ST	AP	IM	42	41	39	38
Install {name} Apron Lighting	ST	AP	LI	42	41	39	38
BUILDINGS							
<Construct/Expand/Improve/Modify/Rehabilitate> Aircraft Rescue & Fire Fighting Building [Pt.	SA	BD	EX	73	71	68	66
<Construct/Expand/Improve/Modify/Rehabilitate> {describe} Building	ST	BD	MS	34	32	31	29
<Construct/Expand/Imp/Modify/Rehabilitate> <Snow Removal Equipment/Chemical Storage	ST	BD	SN	41	39	38	36
EQUIPMENT							
Acquire Driver's Enhanced Vision System	ST	EQ	MS	41	40	38	37
Acquire Interactive Training System	OT	EQ	MS	25	24	23	22
Acquire Aircraft Rescue & Fire Fighting Vehicle [required by Part 139 only]	SA	EQ	RF	98	95	93	90
Acquire Aircraft Rescue & Fire Fighting Safety Equipment {describe} [required by Part 139]	SA	EQ	RF	98	95	93	90
Acquire Security Equipment/Install Fencing {e.g., access control} [required by Part 107]	SA	EQ	SE	86	83	81	78
Acquire Aircraft Deicing Equipment	ST	EQ	DI	43	41	40	38
<Acquire/Install/Rehabilitate> Emergency Generator	ST	EQ	LI	47	45	44	42
Acquire Aircraft Rescue & Fire Fighting Safety Equipment {describe} [not required by Part 139]	ST	EQ	MS	41	40	38	37
Acquire Equipment (e.g., Sweepers, etc.)	ST	EQ	MS	41	40	38	37
Acquire Aircraft Rescue & Fire Fighting Vehicle [not required by Part 139]	ST	EQ	RF	50	49	47	46
Acquire Security Equipment/Install Perimeter Fencing {e.g., access control} [not Part 107]	ST	EQ	SE	43	41	40	38
Acquire <Snow Removal Equipment/Urea Truck/etc.>	ST	EQ	SN	48	47	45	44
Acquire Friction Measuring Equipment	ST	EQ	SR	47	45	44	42
Install Weather Reporting Equipment {describe, e.g., AWOS }	ST	EQ	WX	47	45	44	42
FINANCE							
Administrative Costs (PFC)	OT	FI	AD	0	0	0	0
Financing Costs	OT	FI	BO	0	0	0	0
GROUND TRANSPORTATION							
<Construct/Expand/Improve/Modify/Rehabilitate> <Inter/Intra> Terminal People Mover	CA	GT	PM	39	37	36	34
<Construct/Expand/Improve/Modify/Rehabilitate> <Inter/Intra> Terminal People Mover	OT	GT	PM	18	17	16	15
<Construct/Expand/Improve/Modify/Rehabilitate> Access Rail	CA	GT	RL	39	37	36	34
<Construct/Expand/Improve/Modify/Rehabilitate> Access Rail	OT	GT	RL	18	17	16	15
<Construct/Expand/Improve/Modify/Rehabilitate> Access Road	CA	GT	AC	48	46	44	42
<Construct/Expand/Improve/Modify/Rehabilitate> Access Road	OT	GT	AC	23	22	21	20
<Construct/Expand/Improve/Modify/Rehabilitate> Service Road	OT	GT	SV	22	21	20	19
HELIPORT							
<Construct/Expand/Improve/Modify/Rehabilitate> Helipad/Heliport	CA	HE	CO	63	61	59	57
<Construct/Expand/Improve/Modify/Rehabilitate> Helipad/Heliport	ST	HE	CO	52	50	49	47
RESIDENCE							
Noise Mitigation measures for residences outside 65 DNL	EN	HO	60	46	44	42	40
Noise Mitigation measures for residences within 65 - 69 DNL	EN	HO	65	56	54	52	50
Noise Mitigation measures for residences within 70 - 74 DNL	EN	HO	70	63	61	59	57
Noise Mitigation measures for residences within 75 DNL	EN	HO	75	70	68	66	64
LAND							
Acquire <land/easement> for noise compatibility/relocation {# relocated} outside 65 DNL	EN	LA	60	46	44	42	40
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 65 - 69 DNL	EN	LA	65	56	54	52	50
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 70 - 74 DNL	EN	LA	70	63	61	59	57
Acquire <land/easement> for noise compatibility/relocation {# relocated} within 75 DNL	EN	LA	75	70	68	66	64
Acquire <land/easement> for development/relocation {list parcels and/or # relocated}	ST	LA	DV	41	40	38	37
Acquire miscellaneous land {describe, e.g., land for outer marker, relocate road}	ST	LA	MS	40	38	37	35
Acquire land/easement for approaches {list parcels and/or # relocated}	ST	LA	SZ	45	44	42	41

NPIAS-ACIP Standard Descriptions, ACIP Codes, and National Priority Ratings

5100.39A
Appendix 6

	ACIP Codes			Airport Code			
PROJECT DESCRIPTION	Purpose	Component	Type	A	B	C	D
				5	4	3	2
NEW AIRPORTS							
Construct New Airport	CA	NA	CO	54	52	50	49
Acquire [existing] Airport	ST	NA	AQ	35	34	32	31
Construct New Airport	ST	NA	CO	44	43	41	40
OTHER							
Construct Deicing Containment Facility	EN	OT	DI	61	59	57	55
Noise Mitigation Measures [miscellaneous]	EN	OT	MS	58	56	54	52
Environmental Mitigation	EN	OT	MT	61	59	57	55
Install Noise Monitoring System/Equipment	EN	OT	NO	63	61	59	57
<Construct/Improve/Repair> <Fuel Farm/Utilities> [MAP]	OT	OT	FF	20	19	18	17
<Construct/Rehabilitate> Parking Lot [non revenue producing-non hub/MAP]	OT	OT	PA	19	18	17	16
<Light/Mark/Remove> Obstructions {list location}[hazard only e.g., approaches]	SA	OT	OB	95	93	90	88
Install <Guidance Signs/ Runway Incursion Caution Bars> [required by Part 139]	SA	OT	SG	92	90	87	85
Install <Guidance Signs/ Runway Incursion Caution Bars> [non Part 139 CS]	SP	OT	SG	80	77	75	73
<Install/Rehabilitate> Airport Beacons [required by Part 139]	SA	OT	VI	89	87	84	82
Install miscellaneous <NAVAIDS/Approach Aids> {seg, circle, beacon, etc., Not ALS}	SP	OT	IN	74	72	70	68
Install miscellaneous <NAVAIDS/Approach Aids> {seg, circle, beacon, etc., Not ALS}	ST	OT	IN	43	42	40	39
Improve Airport <Drainage/Erosion Control/miscellaneous improvements>	ST	OT	IM	45	44	42	41
<Light/Mark/Remove> Obstructions {location}	ST	OT	OB	49	47	46	44
Construct Aircraft Rescue & Fire Fighting Training Facility/Regional Burn Pit/Mobile Training F	ST	OT	RF	49	47	46	44
Install <Guidance/other> Signs [not Part 139]	ST	OT	SG	47	45	44	42
Construct Deicing Containment Facility	ST	OT	DI	41	40	38	37
PUBLIC BUILDINGS							
Noise Mitigation measures for public buildings outside 65 DNL	EN	PB	60	46	44	42	40
Noise Mitigation measures for public buildings within 65 - 69 DNL	EN	PB	65	56	54	52	50
Noise Mitigation measures for public buildings within 70 - 74 DNL	EN	PB	70	63	61	59	57
Noise Mitigation measures for public buildings within 75 DNL	EN	PB	75	70	68	66	64
PLANNING							
Conduct <Environmental Assessment/Environmental Impact Statement/Feasibility> <study/up	EN	PL	MA	68	66	64	62
Conduct Noise Compatibility Plan study/update {Part 150}	EN	PL	NO	63	61	59	57
Conduct Ground Transportation/Rail Study	PL	PL	AC	63	61	59	57
<Conduct/Update> <Airport Master Plan Study {ALP, EA, etc.}>	PL	PL	MA	68	66	64	62
Conduct/Update Metropolitan System Plan Study	PL	PL	ME	63	61	59	57
<Conduct/Update> {name} (e.g., Pavement Maintenance Plan, PCI, NPDES, etc.)	PL	PL	MS	58	56	54	52
<Conduct/Update> State System Plan Study	PL	PL	ST	66	64	62	60
Conduct Vertiport/Tiltrotor Plan	PL	PL	VT	51	49	47	45
RUNWAYS							
Construct Runway {name}	CA	RW	CO	64	63	61	59
Extend Runway {name}	CA	RW	EX	56	54	53	51
Construct Runway {name} (environmental mitigation)	EN	RW	CO	76	74	72	70
Rehabilitate Runway {name}	RE	RW	IM	72	70	68	66
Rehabilitate Runway <Lighting/Electrical Vault>	RE	RW	LI	72	70	68	66
Install Runway Lighting (HIRL, MIRL) [Required by Part 139]	SA	RW	LI	97	94	92	89
Install Runway Lighting (HIRL, MIRL) [non Part 139 CS]	SP	RW	LI	84	81	79	77
<Construct/Extend/Improve> Runway {name} Safety Area [Primary Airports]	SA	RW	SF	97	94	92	89
<Apply Friction Course/Groove> Runway	SP	RW	FR	86	84	82	80
Install Runway {name} distance-to-go Signs	SP	RW	SG	86	84	82	80
Install Runway {name}<Vertical/Visual> Guidance System [PAPI/VASI/REIL/ALS/etc.]	SP	RW	VI	84	81	79	77
Construct Runway {name} [includes relocation]	ST	RW	CO	53	52	50	49
<Construct/Extend/Improve> Runway {name} Safety Area [Non-Primary Airports]	ST	RW	SF	50	48	47	45
Install Runway Lighting (HIRL, MIRL, TDZ, LAHSO or CL)	ST	RW	LI	50	48	47	45
<Extend/Widen/Strengthen> Runway {name} [to meet standards]	ST	RW	IM	50	48	47	45
Install <full/partial> Instrument Approach Aid {describe, e.g., install localizer]	ST	RW	IN	48	46	45	43
Install Runway {name} Sensors	ST	RW	SR	50	48	47	45
Install Runway {name} <vertical/visual> Guidance System [PAPI/VASI/REIL/ALS/etc.]	ST	RW	VI	50	48	47	45

NPIAS-ACIP Standard Descriptions, ACIP Codes, and National Priority Ratings

5100.39A
Appendix 6

PROJECT DESCRIPTION	ACIP Codes			Airport Code			
	Purpose	Component	Type	A	B	C	D
				5	4	3	2
SEAPLANE BASES							
Rehabilitate Seaplane <ramp/floats>	RE	SB	IM	72	70	68	66
<Construct/Improve/Modify> Seaplane ramp/floats	CA	SB	CO	64	63	61	59
<Construct/Improve/Modify> Seaplane ramp/floats	ST	SB	CO	53	52	50	49
TERMINAL DEVELOPMENT							
Construct Terminal Building	CA	TE	CO	49	47	45	43
Expand Terminal Building	CA	TE	EX	40	39	37	35
<Improve/Modify/Rehabilitate> Terminal Building	CA	TE	IM	44	43	41	39
Construct Terminal Building	ST	TE	CO	40	38	37	35
Expand Terminal Building	ST	TE	EX	32	31	29	28
<Improve/Modify/Rehabilitate> Terminal Building	ST	TE	IM	36	35	33	32
Acquire Handicap Passenger Lift Device	ST	TE	MS	31	29	28	26
TAXIWAYS							
Construct Taxiway {name}	CA	TW	CO	61	59	57	56
Extend Taxiway	CA	TW	EX	53	51	49	47
Construct Taxiway {name} (environmental mitigation)	EN	TW	CO	72	70	68	66
Rehabilitate Taxiway	RE	TW	IM	68	66	64	62
Rehabilitate Taxiway {name} Lighting	RE	TW	LI	68	66	64	62
Install Taxiway {name} Lighting (MITL) [Required by Part 139]	SA	TW	LI	92	89	87	84
Install Taxiway {name} Lighting (MITL) [non Part 139 CS]	SP	TW	LI	79	77	75	72
Construct Taxiway {name} [includes relocation]	ST	TW	CO	50	49	47	46
<Extend/Widen/Strengthen> Taxiway {name}	ST	TW	IM	47	45	44	42
Install Taxiway {name} Lighting (e.g., SMGCS, reflectors, MITL)	ST	TW	LI	47	45	44	42
Install Taxiway {name} Sensors	ST	TW	SR	47	45	44	42
VERTIPORTS							
<Construct/Expand/Improve/Modify/Rehabilitate> Vertiport	CA	VT	IM	50	48	46	44
<Construct/Expand/Improve/Modify/Rehabilitate> Vertiport	ST	VT	IM	41	39	38	36

A = Airport Code (2 to 5 pts.):
Primary Commercial Service Airports
A = Large and Medium Hub = 5 pts
B = Small and Non Hub = 4 pts
Non Primary Commercial Service, Reliever, and General Aviation Airports.
Aircraft/Itinerant Operations
A = 100 or 50,000 = 5 pts
B = 50 or 20,000 = 4 pts
C = 20 or 8,000 = 3 pts
D = <20 and <8,000 = 2 pts

Priority Equation = k5*P*(k1*A+k2*P+k3*C+k4*T)

Priority Number = .25P(A+1.4P+C+1.2T)

k1 =	**1.00**
k2 =	**1.40**
k3 =	**1.00**
k4 =	**1.20**
k5 =	**0.25**
k6 =	**0.00**

Figure 8-8 - FAA Priority Rating Process

As shown, the FAA model gives priority to runway safety area construction, obstruction removal, FAR Part 139 airports (those capable of accommodating scheduled air service), noise mitigation projects, ARFF buildings, runway and taxiway lighting and signage, and other safety related projects. The emphasis is clearly on air carrier airports and safety projects.

The Delaware Priority Rating Model has a slightly different set of priorities than the FAA model. Given the focus of the Delaware State funding program on economic viability projects and infrastructure preservation, there is an emphasis on system viability and preservation rather than operational safety. This emphasis recognizes the federal role of enhancing operational safety, while the State role is one of public-use airport preservation and economic development.

Figure 8-9 - Aerial of New Castle Airport

2.2 CONTINUING PLANNING PROCESS

Unlike previous State System Plans, the Continuing Planning Process has changed because of the new funding sources available to DelDOT Aeronautics. This places more responsibility on Aeronautics' staff with regard to administering funding and determining the eligibility of projects. In this regard, the Aviation System Plan becomes a living document that must respond to the needs of the aviation community in Delaware.

In the continuing airport system planning process, activities that the Delaware DOT Office of Aeronautics would undertake can be grouped into five general categories:

- ***State Funding Program:*** To administer funding to privately owned system airports, the State will need to set up a program that monitors the availability of funds and keeps records on project funding requests from system airports. The availability of funds can be tracked from jet fuel and avgas fuel sales tax as reported to State agencies. The project funding requests from private airports must be reviewed for aviation eligibility and some type of independent fee estimating process should be set up to determine the financial reasonability of the request. The requested items, once screened, would be subjected to the priority rating process described earlier. In addition to the privately owned airports, the State must match Federally eligible projects for publicly owned airports in the system. Again, budgeting and programming will increase the continuing planning process workload relative to previous system plans.

Figure 8-10 – Windsock at Delaware Airpark

- ***Monitoring:*** System airports should be surveyed on an annual basis (as is presently the case for licensing purposes) to determine how well they are accommodating aviation demand, the condition of runway surfaces and visual ranges, the status of obstruction removal programs, general aviation security program implementation, and the status of development activity. This is necessary not only to fulfill State aviation regulations, but also to compare the actual conditions at each airport with the forecast needs to determine if the assumptions made during the planning process are holding over time.

- ***Operations Counting Program:*** In 2012, the State purchased two acoustical aircraft counting devices to continue the airport traffic counting program which verifies activity levels at non-towered airports in Delaware. For one year, these counters will be moved from airport to airport at two-week intervals. This program should be updated in the future to see if forecast operations are tracking with actual operations.

- ***Delaware Aviation Advisory Council (DAAC):*** This Council was created by State legislation and has reviewed the aviation system plan and will continue to serve at the Secretary's discretion. The DAAC has been involved in other aviation issues such as the Delaware Aviation Summit, the Statewide General Aviation Security Plan, and the review of safety initiatives as private-use airports. Other aviation issues can be vetted through this committee as they arise.

- ***Special Studies:*** These studies include business plans, economic impact studies, and other items of interest that may require special study. In general, the application of these studies is on a statewide basis. Thus, airport business plans are developed for all eligible airports. The economic impact study is also statewide.

- ***Implementation "Trigger Points":*** Aviation demand trigger points or milestones can be defined as those aviation activity levels that, upon being reached at an airport, will require an implementation action by airport sponsors or State or local officials.

Airport expansion that is tied closely to aviation activity must be tracked closely. In these cases, when aviation demand falls behind predicted levels or if it is improbable that forecasts will be met, further development activity at that airport should be postponed until those activity levels are reached. Conversely, if airport activity exceeds forecast demand levels, their development activities should be implemented on an accelerated schedule. In this manner it is possible that Phase I development activities would be postponed until Phase II. Guidelines for the identification of implementation trigger points in Delaware are presented in **Table 8-12**. It should be noted that these trigger points are not intended to constrain or prevent airport development desired by airport sponsors. Rather, they are meant as general planning guidelines in a rule-of-thumb context.

Table 8-12 - SASP Implementation Trigger Points

Implementation Action	Criteria
Purchase land for airport expansion	Based upon Master Plan or Airport Layout Plan recommendations and sponsor approval.
Improve runway system capacity	When airfield activity exceeds 80 percent of capacity. (No Delaware airports are forecast to exceed 80% of their runway capacity by the year 2040.)
Extend, widen, or strengthen airport runway	Based upon airport sponsor support and existing demand or immediate forecast demand of 500 annual itinerant operations by an aircraft or aircraft type needing the upgraded condition.
Initiate general aviation apron/ramp expansion	When tie-down space exceeds 80 percent occupancy.
Initiate aircraft hangar expansion	Based upon aircraft owner waiting lists.
Expand airport terminal building	When terminal building utilization exceeds 6.0 enplaned passengers per square foot annually.
Develop Civil Air Terminal for overnight air cargo airline parking	Once funding and environmental approvals are obtained.
Extend Sussex County runway to 6,000 feet of usable runway length	Once funding is obtained.

A vital part of successful implementation of the plan is establishing and maintaining a dialogue among the aviation community and the general public as well as the various agencies involved in the study. Implementation of the plan, however, must begin with the local sponsors initiating and partially financing the system improvements. The system plan will succeed only if these local sponsors know, in advance of their own planning, where they fit in the overall system and the reasoning and assumptions on which the recommendations for their airports were made in the recommended aviation system. If the system plan is viewed by all concerned as a flexible working tool to guide and direct their efforts, aviation users and facility sponsors in Delaware can work toward the airport system they need.

Figure 8-11 – New Castle Airport Panorama