Delaware Aviation System Plan Update

PHASE II REPORT

DRAFT

Prepared for:

STATE OF DELAWARE
Department of Transportation

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Chapter 5:
Identification of Alternatives

IDENTIFICATION OF AVIATION SYSTEM 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 Aviation Advisory Committee, 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 tools, general aviation airport security plans, and legislative recommendations. In Phase I of the State Aviation System Plan, four work elements were undertaken:

- Element 1: Issues, Goals, and Objectives
- Element 2: Analysis of Existing System
- Element 3: Forecast of Aviation Demand
- Element 4: Demand/Capacity & Aviation System Needs

Phase II of the State System Plan addresses the following questions:

- How has the most recent recession impacted aviation in Delaware?
- Can the long-term system be sustained with fewer FAA dollars?
- What are the implications of full (unrestricted) joint use at Dover Air Force Base and how would that impact the public-use airport system?
- What are the implications of scheduled airline passenger service in central Delaware?
- Is civilian air cargo service possible in Delaware?
- What impact would the implementation of green technology have on system airports?
- What types of aviation subsystems require State regulation, guidance, policy input, or financing?
- What are the financial implications of the recommended plan?
- How is the recommended plan implemented?

Key issues that could change the aviation system in Delaware include the possible unrestricted joint use of Dover AFB, the development of a civilian air cargo hub at the Civil Air Terminal at Dover AFB, the loss of one or more private airports, and the removal of Summit Airport from the FAA funding program. Also, even though Allegiant Airlines has selected Salisbury, MD to initiate service to the Orlando, FL area, Dover is still in the running as another outlet or location for Allegiant service.

To fully examine the aviation alternatives and issues facing Delaware aviation, the Phase II work scope is composed of six primary work elements including:

- Element 5: Identification of Aviation System Alternatives
- Element 6: Evaluation of Aviation System Alternatives
- Element 7: Selection and Description of Recommended System
- Element 8: Financial and Implementation Plan
- Element 9: Special Study Products
- Element 10: Coordination and Documentation

Element 5 - Identification of Aviation System Alternatives is based upon the forecasts of demand and the system requirements established in the preceding work phases. Included among the concepts which are considered as alternatives are:

- The Baseline Alternative (Status Quo)
- A Contracted System of Airports Alternative
- A Contingency Aviation System Alternative

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).

1. BACKGROUND

IN FORMULATING ALTERNATIVES, IT IS IMPORTANT TO review and use the information gathered in the data collection effort. In this regard, the Phase I study performed a detailed analysis of the aviation system that answered the following questions:

- What are the most pressing aviation issues facing decision makers in Delaware?
- What are the State's overall goals with respect to aviation?
- What is the present make-up of the aviation system in Delaware?
- In the future, what will aviation activity be like in the State?
- What are the physical development needs of the system?

Since the previous aviation system plan, several new issues have arisen that will change the focus of the present planning. These are described below.

1.1 Delaware's Most Pressing Aviation Issues:

The most pressing aviation issues identified in Phase I of this study included the following:

- Future Airport Funding Shortfalls
  - FAA, State, Local
  - Need for Strategic Plan of Economic Sustainability
- Civil Air Terminal Development
  - Air Cargo
  - Schedule Airline Service
- Airport Security Programs
- Delaware Airpark Expansion
- Summit Airport Expansion
- Mitigation or Removal of Airport Airspace Obstructions
- Economic Impacts of Aviation in Delaware
  - Airport Community Value Applied to Recommended Plan
  - Recommendations Prioritized by Economic Sustainability
- Protection/Development of Non-NPIAS Airports
- Airport/Community Land Use Compatibility
- Coordination of SASPU with Other Transportation Planning & the Public
- Future of Military Aviation in Delaware
- Reliable Airport Operations Counts
- Green Technology Impacts

- Since the release of the Phase I study, two other important issues have arisen that will impact the aviation system and the development of alternatives for the Phase II study. These issues include the following:
- Potential Loss of Privately Owned Airports to the Public-Use System
- Potential Full (Unrestricted) Joint Use of Dover AFB

1.2 Delaware's Overall Aviation Goal:

- ***Aviation Goal:*** To enhance Delaware's economic development by fostering and promoting a safe and efficient aviation system for the movement of goods, services, and people and to encourage and promote aviation and aviation safety.

1.3 Delaware's Existing Airport System:

- ***Airport 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 have been stable in Delaware with areas of slow growth. Total existing based aircraft = 437; total annual aircraft operations = 197,600.

- ***Airspace Structure and Navaids:*** Low activity levels indicate that significant airspace capacity is available for the future. New Castle Airport has the greatest airspace challenges due to its proximity to the Class B airspace associated with Philadelphia International. These and other airspace issues will be examined in the Evaluation of Alternatives.

- ***Surface Transportation:*** The present interaction of the highway and airport system is adequate. However, estimates of future aviation related surface traffic will be compared to capacities of airport access points.

- ***Environmental Considerations:*** For airport development to occur, planners need to be aware of the extensive amount of wetlands in and around Delaware airports. Another environmental concern includes the fact that all of Delaware is classified as non-attainment for ozone standards.

1.4 Delaware Aviation Activity in the Future:

- ***Forecast Aviation Activity:*** Total based aircraft are forecast to grow from 437 in 2010 to 576 by the year 2030. Aircraft operations are anticipated to grow from 197,600 to 261,100 during the same period. There are no airfield operational capacity constraints anticipated during the planning period. However, there may be constraints to the size and type of aircraft that desire to use certain airports in Delaware because of limited runway lengths and strengths.

1.5 Physical Development Needs of the System:

Airport upgrades and facility needs based on these criteria affect 9 of the 10 public-use airports carried through this analysis. Of these airports, 5 have runway or taxiway upgrades listed as needed, while 9 airports have landside improvement needs listed. For airfield improvements, suggested runway extensions or upgrades were made for the following Delaware airports:

- Chandelle Estates
- Chorman Airport
- Delaware Airpark
- Summit Airport
- Sussex County

Landside improvements focused mostly upon aircraft storage hangar and apron area improvements at various system airports. In this regard, a total 31,000 square feet of terminal space, 30,600 square feet of conventional hangar space, 178 T-hangar units, and almost 12,600 square yards of apron area are needed at system airports within the planning horizon.

From the overall analysis, it was shown that no airfield demand/capacity shortfalls are expected to develop over the planning period. Only New Castle Airport came within 52 percent of its estimated airfield capacity. The aviation system requirements estimated for each airport represent normal improvements to provide safety and meet demand increases over the planning period. The focus of the landside analysis was upon the passenger and aircraft processing capabilities of the individual airports.

2. IDENTIFICATION OF ALTERNATIVES

BASED UPON THE FORECASTS OF DEMAND AND the system requirements established in the preceding work phases, three alternative systems were identified for further evaluation. Concepts of which were considered for development as alternatives included:

- ***The Baseline Alternative:*** This alternative is based on an analysis of the adequacy of the existing aviation system. It assumes a status quo scenario where no changes other than those already planned are included.

- ***A Contracted System of Airports Alternative:*** This alternative considers potential closures of privately owned airports and associated impacts.

- ***A Contingency Aviation System Alternative:*** This alternative considers the potential impacts of several possible occurrences that could significantly change the aviation system in Delaware. These impacts revolve mostly around potential changes at Dover AFB, but also include changes to public-use status of some privately owned airports.

For each alternative, the number of based aircraft and operations is presented in Table 5-1.

Table 5-1 - Year 2030 Forecast GA Demand for Each Alternative

Aviation Facility	Alternative 1		Alternative 2		Alternative 3	
	Based A/C	Operations	Based A/C	Operations	Based A/C	Operations
Chandelle Estates	32	4,200	0	0	16	2,100
Chorman Airport	25	17,300	0	0	25	17,300
Delaware Airpark	74	29,900	153	44,700	89	30,300
DELDOT Helistop	0	50	0	50	0	50
Dover AFB[1]	0	1,400	0	0	21	5,500
Jenkins Airport	26	1,800	0	0	13	900
Laurel Airport	18	11,600	0	0	18	11,600
New Castle Airport	249	92,100	249	93,150	249	92,100
Smyrna Airport	13	3,000	0	0	6	1,500

[1] Represents general aviation activity only.

Table 5-1 - Year 2030 Forecast GA Demand for Each Alternative						
Aviation Facility	**Alternative 1**		**Alternative 2**		**Alternative 3**	
	Based A/C	Operations	Based A/C	Operations	Based A/C	Operations
Summit Airport	57	55,000	57	55,000	57	55,000
Sussex County Airport	82	44,800	117	68,250	82	44,800
GRAND TOTALS	**576**	**261,150**	**576**	**261,150**	**576**	**261,150**

This distribution of demand is based on the Forecast of Aviation Demand (Chapter 3 of Phase 1). Each alternative system has the same number of based aircraft and the same number of operations. However, the assumptions about the availability of facilities in each option dictated the demand distribution. Each alternative system is described in the following sections.

2.1 Alternative 1 – No Action (Adequacy of Existing System)

Alternative 1 is called the "No Action" Alternative because it examines the adequacy of the existing system without changes or improvements (see Figure 5-1). The alternative serves as a baseline comparison to each of the "action" alternatives (2 and 3) and subsystems.

The adequacy of the existing system of airports to meet the State's air transportation demands is determined by relating the findings concerning the needed number, type, and general location of airports to the inventory of existing airports. In this determination, consideration is given to the estimated aircraft processing capacity of the existing airports, 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 adequacy of existing and planned surface access.

It should be noted that Alternative 1 may represent the highest utilization of some privately owned, public-use airports in Delaware. That is, the status quo may actually be optimistic, relative to the preservation of all privately owned, public-use airports in the State. As described below, Alternative 2 presents a contracted option, while Alternative 3 shows in the impact of a number of possible future scenarios.

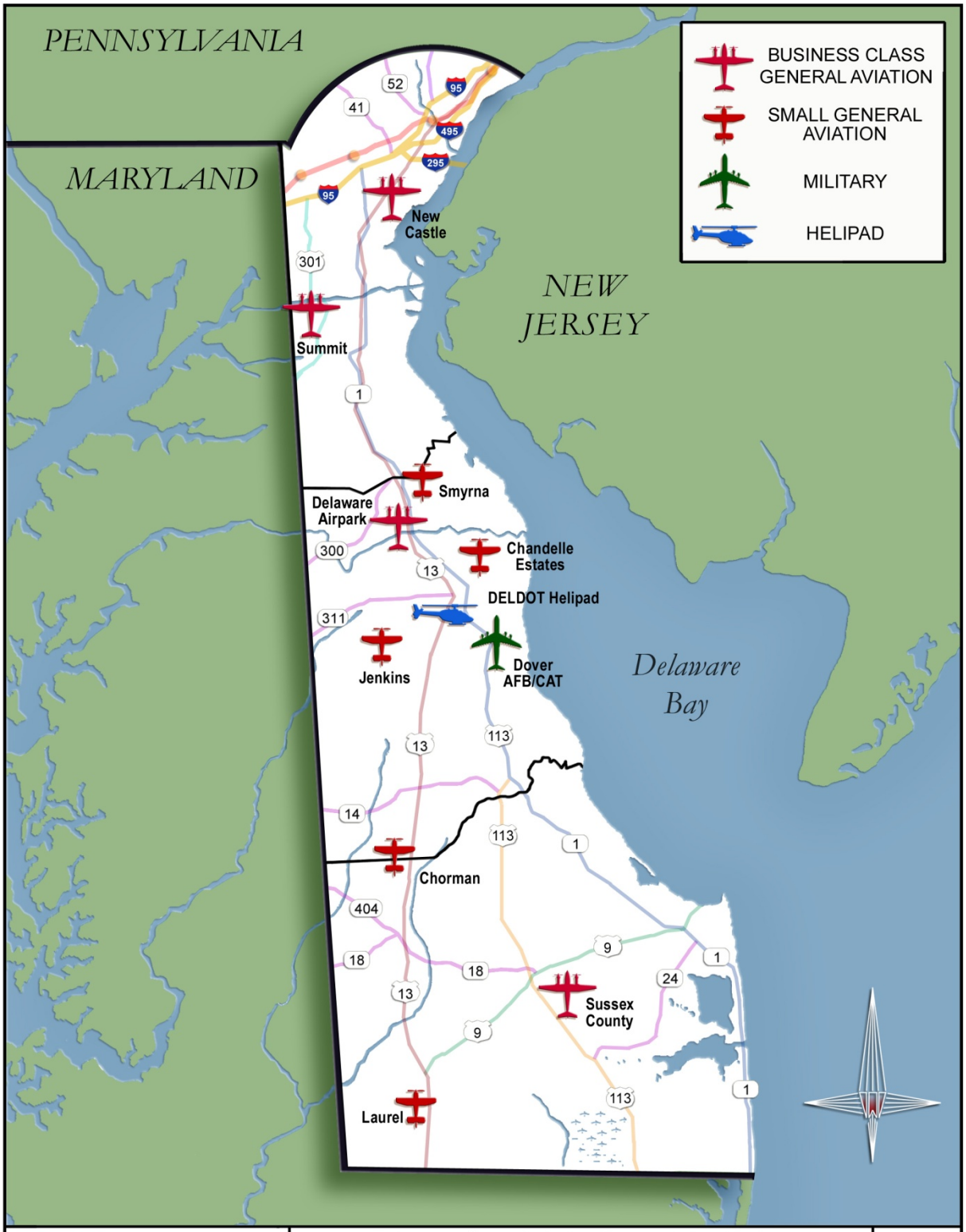
2.2 Alternative 2 – Contracted System of Airports

Alternative 2 is called the "Contracted System of Airports" because it examines the impacts created with the loss of certain privately owned airports in the State. Under this alternative, 5 of the 10 existing system airports were assumed to close by the year 2030 for various reasons. In addition, it was assumed that no joint use of Dover AFB would be permitted due to security or other concerns. 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 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, Smyrna, and Laurel. It was assumed that privately owned Summit Airport would survive due to its existing business model, funding, and planned facility expansion. Summit Airport is owned by Greenwich AeroGroup, a large aircraft services company with more than 650 employees.

It was assumed that Dover AFB would not be available for civil aviation use under this alternative. As such, many of the business jet operations that would have taken place at the Civil Air Terminal would be transferred to other airports. The closure to civil aviation would not impact the potential air cargo operation at the CAT, but it would impact the two NASCAR weekends each year. In this regard, many of the race teams rely upon air access to Dover Downs via Dover AFB. With increasing competition from other venues, the loss of this convenient access point could trigger a cutback in NASCAR activities. Thus, this alternative will examine the impacts of the potential closure of Dover AFB to civil aviation.

Figure 5-3 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.



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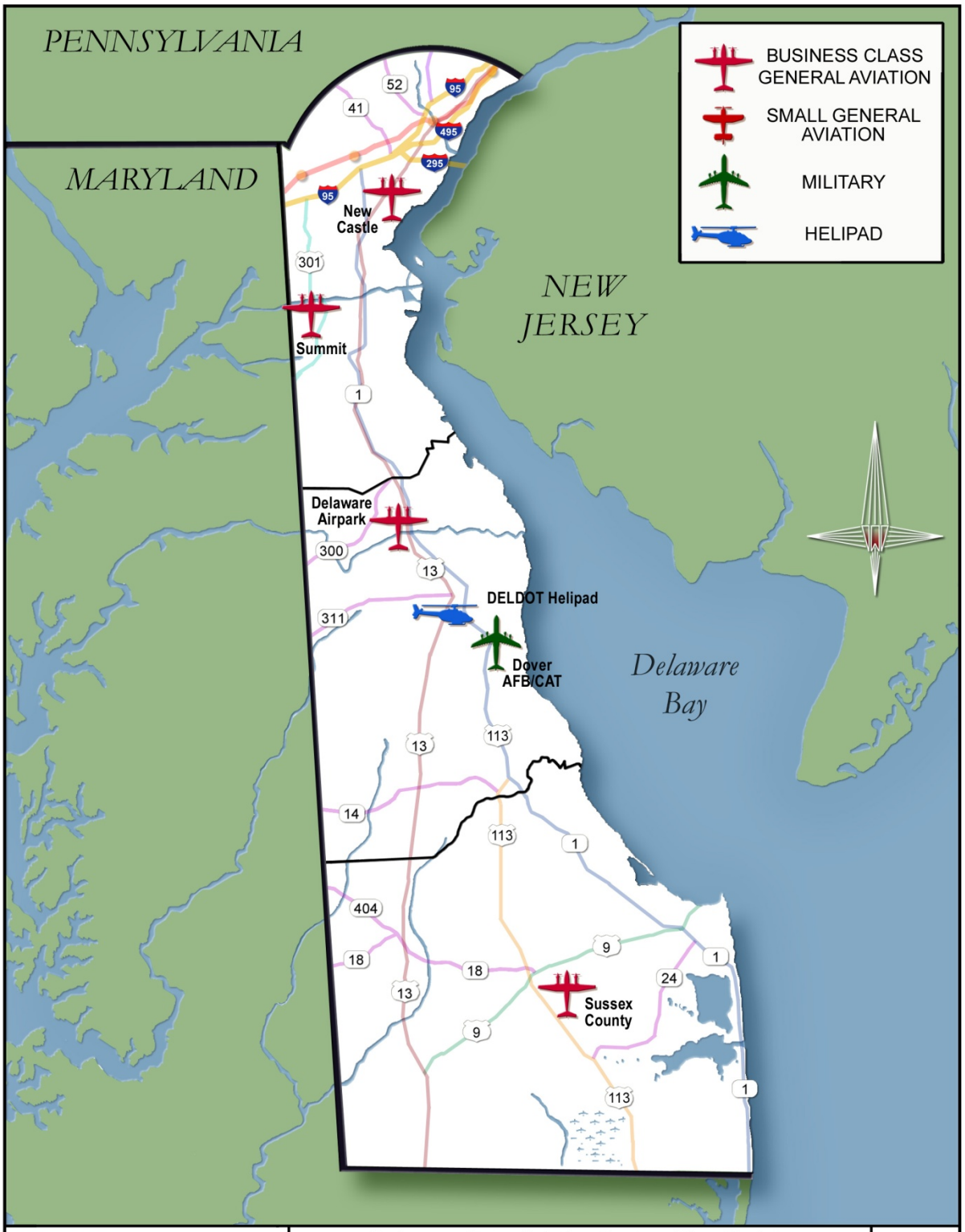
Alternative 1 - No Action

Figure 5-1



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Alternative 2
Contracted Alternative System

Figure 5-2

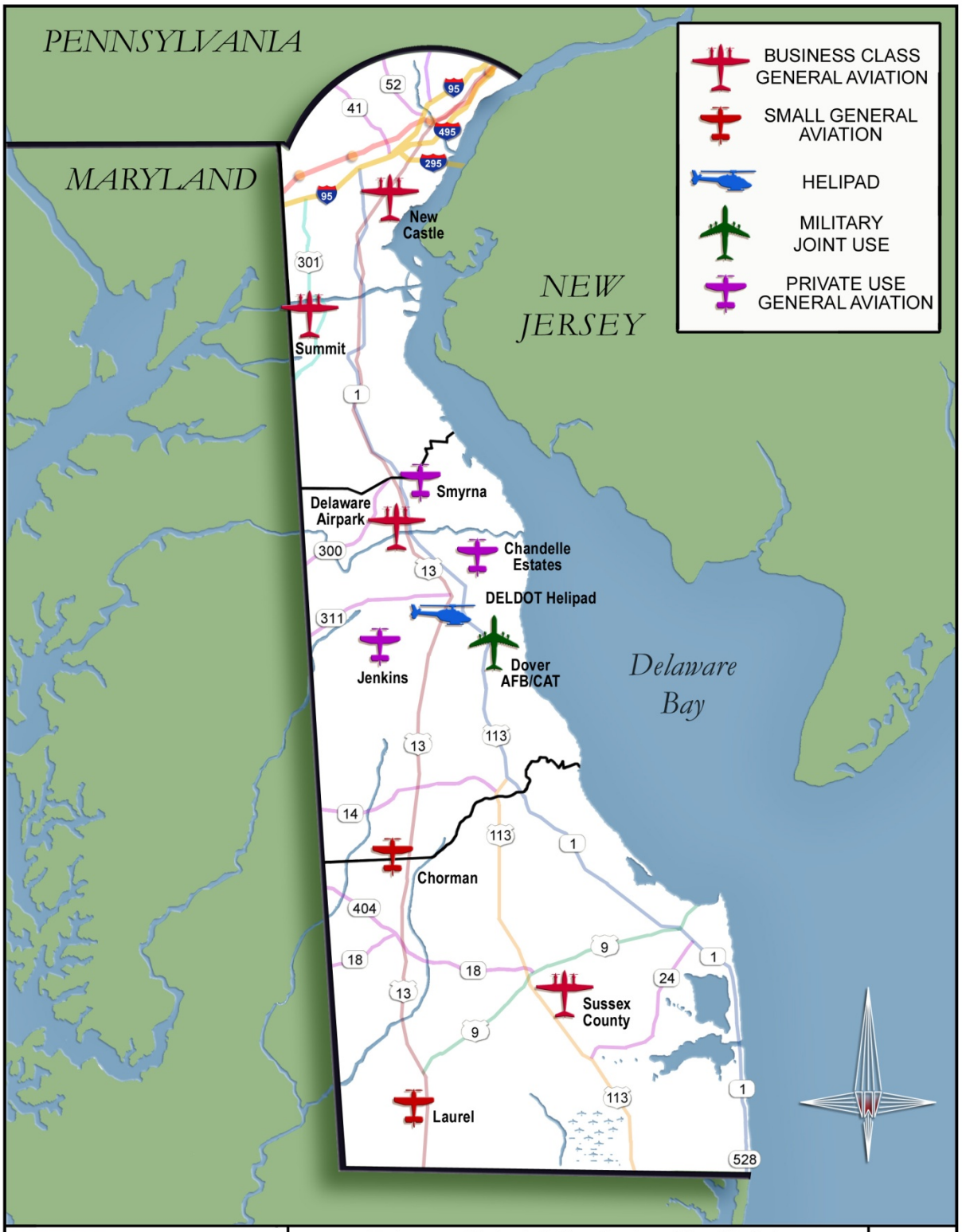
2.3 Alternative 3 – Contingency Aviation System

Alternative 3 is called the "Contingency Aviation System" because it considers the potential impacts of several possible occurrences that could significantly change the aviation system in Delaware. These impacts revolve mostly around potential changes at Dover AFB, but also include changes to public-use status of some privately owned airports. Contingency changes that were factored into the analysis included the following:

- Full Joint Use of Dover AFB: There is some talk about a new round of Base Realignment & Closure (BRAC) for Dover AFB for 2015 or before. These talks center on the possibility of consolidating the role of Dover AFB with that of McGuire AFB in New Jersey. Under the scenario, McGuire would gain the heavy lift cargo mission from Dover, while Dover may keep the mortuary and its mission.
  - There is also the possibility of future full joint use of Dover AFB, without a BRAC. This would permit full civilian use of the facility, while at the same time, keep the heavy lift mission. Such a circumstance would favor the development of the CAT for supplemental air cargo carrier overnight parking.
- Loss of Public-Use status of Chandelle Estates, Jenkins, and Smyrna.
- Loss of NPIAS funding eligibility of Summit Airport.
- Expansion of Sussex County Airport primary runway to 6,000 feet.

Of significance in the potential BRAC of Dover AFB are the civilian options that become available with that occurrence. The potential relocation of the Dover AFB mission could also jeopardize the current attempt to develop the Civil Air Terminal ramp for overnight supplemental cargo carrier aircraft. In this regard, any loss of mission at Dover AFB will have dire impacts on local employment, income, total spending and tax collections in central Delaware. However, one potential benefit to the civilian general aviation system would be the possible full joint use of the Base (no prior permission requirement, no cap on civilian operations). Such a situation would require rethinking of the need for an expanded Delaware Airpark, as all of those operations and more could be accommodated by the Dover AFB runway system.

It is possible that in the future, full joint use of Dover AFB could be achieved (similar to Charleston, SC), without a BRAC. If that were to occur, the benefits of developing the CAT for air cargo carrier overnight parking would still have a demand. It would also permit civilian use of the facility, thereby decreasing the need for expansion of Delaware Airpark. In addition, the loss of public-use status of Chandelle Estates, Jenkins, and Smyrna would likely drive some based aircraft to a newly full-joint use facility such as the CAT at Dover AFB. Other possible uses for the CAT could occur with or without the BRAC, including airline passenger service and civilian air cargo operations. All of these contingencies are examined in the evaluation of aviation system alternatives (Chapter 6).



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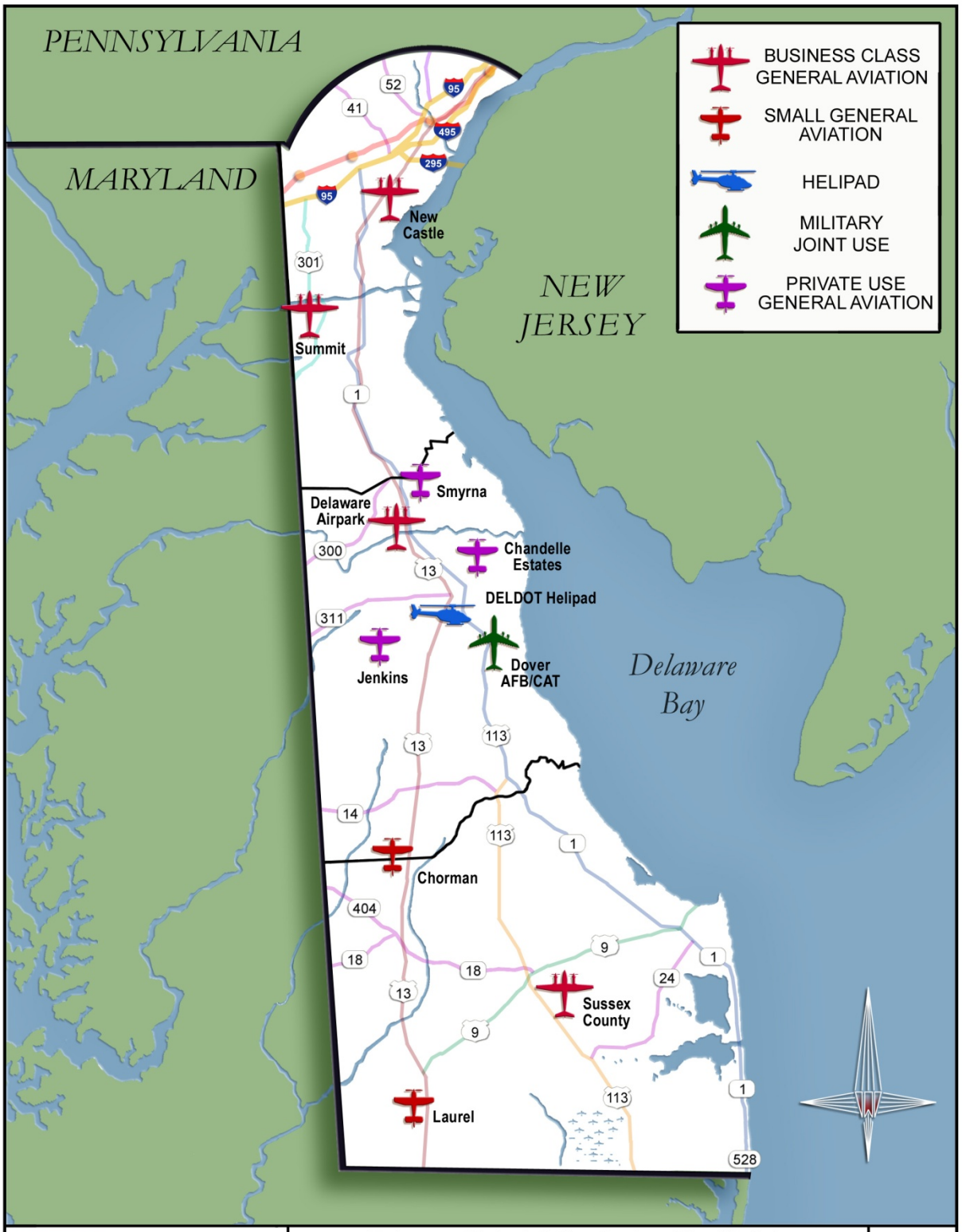
Alternative 3 - Contingency Aviation System

Figure 5-3



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Alternative 3 - Contingency Aviation System

Figure 5-3

Chapter 6:
Evaluation of Alternatives

EVALUATION OF ALTERNATIVES

1. INTRODUCTION

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. This chapter presents a summary of the methods, analysis, and findings of the evaluation process.

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:

- ***Ability to Serve Forecast Demand:*** How well will each alternative accommodate projected demand? This includes general aviation activity and potential airline and air cargo demand. Alternative 3 will test the limits of this evaluation criterion relative to the need for additional facilities in Central Delaware.

- ***Impact of Airspace Obstructions:*** This criterion was included because the State has an interest in the potential removal of obstructions via State law and regulations that authorize the removal of airspace obstructions from public-use airports in Delaware. The alternatives impact the required funding for obstruction removal by virtue of having different numbers of public-use airports included in each.

- ***Impact on Surface Transportation System:*** The evaluation uses previous work on surface transportation to determine if the new alternatives have any significant impact or deviation from previous analyses.

- ***Environmental & Land Use Compatibility:*** The impact of airport operations on environmental and land use compatibility will be measured indirectly by determining average real estate values in the airport area as compared with other areas of a community that are not impacted by airport noise.

- ***Development Costs:*** 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 contingencies described in Alternative 3, there are several potential impacts to Delaware's aviation system that should be addressed individually. This criterion examines the potential contingencies that could happen at Dover AFB that are not measured against Alternatives 1 or 2.

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

2. EVALUATION OF ABILITY TO SERVE FORECAST DEMAND

EACH OF THE ALTERNATIVES WAS EVALUATED TO determine its ability to meet forecast demand levels within accepted performance standards. These evaluations were performed on a facility-by-facility basis and results were aggregated to permit comparisons at the systems level. Included among the material analyzed in determining this overall ability to meet forecast demand levels were the number, types, and quantities of airport facilities needed to serve aviation demand for each alternative.

One measure of the ability to serve forecast aviation demand is the service capability of each alternative airport system. In this regard, service capability can be identified for two separate components of the airport: airfield and landside.

- ***Airfield Service Capability:*** This is the ability of Delaware airports to accommodate forecast demand operations depicted in each alternative. Deficiencies in airfield capacity would be remedied in each alternative by the conceptual addition of runways or taxiways where needed.

- ***Landside Service Capability:*** This is the ability of Delaware airports to process aircraft and passengers at the hangars and terminal areas of each airport. 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.

It should be noted that privately owned, public-use airports were included in the analysis since they are eligible for some State funding (obstruction removal and other project funding).

2.1 Airfield Service Capability

In Chapter 4 of the Phase I study, a demand/capacity analysis 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 "Baseline" Alternative because it examines the adequacy of the existing system. It assumes a status quo scenario where no changes other than those already planned are included. This 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.
- Delaware Airpark will construct a 4,200' X 75' replacement runway with a full parallel taxiway.

- Sussex County Airport will expand its primary runway to 5,500 feet.

Alternative 2 is called the "Contracted System of Airports" because it examines the impacts created with the loss of certain privately owned airports in the State. Alternative 2 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. Assumptions used in Alternative 2 included the following:

- Chandelle Estates, Chorman, Jenkins, Laurel, and Smyrna are assumed to close by 2030 for various reasons.
- Dover AFB (CAT) will no longer be a joint-use facility due to unforeseen security issues or other concerns. The 1,400 GA itinerant operations at the CAT move to (75%) New Castle and (25%) to Sussex County.
- Delaware Airpark will construct a 5,500 X 75' replacement runway with a full parallel taxiway. Delaware Airpark absorbs the demand from Chandelle Estates, Jenkins, Smyrna, and 32 percent of Chorman's aircraft and operations.
- Expansion of Sussex County Airport's primary runway to 6,000 feet. Sussex County absorbs Laurel Airport's demand and 68 percent of aircraft and operations from Chorman.

Alternative 3 is called the "Contingency Aviation System" because it considers the potential impacts of several possible occurrences that could significantly change the aviation system in Delaware. These impacts revolve mostly around potential changes at Dover AFB, but also include changes to public-use status of some privately owned airports.

- Full Joint Use of Dover AFB: A new round of Base Realignment & Closure (BRAC) for Dover AFB for 2015 or before would consolidate the role of Dover AFB with that of McGuire AFB in New Jersey.
- Unrestricted joint use of Dover AFB will change the ASV of the CAT from 13,500 operations to 230,000 operations.
  - There is also the possibility of future full joint use of Dover AFB, without a BRAC. This would permit full civilian use of the facility, while at the same time, keep the heavy lift mission.
- Loss of Public-Use status of Chandelle Estates, Jenkins, and Smyrna. Half of each airport's operations and based aircraft are relocated to nearby airports.
- Expansion of Sussex County Airport primary runway to 6,000 feet.
- Delaware Airpark will construct a 4,200' X 75' replacement runway with a full parallel taxiway.
- Chorman Airport will construct a 3,600' X 60' runway with full parallel taxiway.
- Summit Airport will extend their primary runway to 5,320' but is expected to lose NPIAS funding eligibility prior to developing the extension.

The airfield demand/capacity capabilities for each of the airports by alternative are shown in Table 6-1.

Table 6-1 Airfield Demand/Capacity Comparisons

Alternative/Airport	Annual Service Volume	Year 2030 Demand	Percent of Capacity	Annual Delay (Hours)
Alternative 1				
Chandelle Estates	46,400	4,200	9%	0
Chorman Airport	53,100	17,300	33%	66
Delaware Airpark	171,300	29,900	17%	35
DelDOT Helistop	5,000	50	1%	0
Dover AFB	13,500	1,400	10%	N/A
Jenkins Airport	24,800	1,800	7%	0
Laurel Airport	32,200	11,600	36%	50
New Castle Airport	194,000	101,000	52%	707
Smyrna Airport	30,000	3,000	10%	0
Summit Airport	170,800	55,100	32%	202
Sussex County Airport	174,500	44,900	26%	120
Total For Alt. 1	***915,600***	***270,250***	***30%***	***1,180***
Alternative 2				
Delaware Airpark	171,300	44,400	26%	118
DelDOT Helistop	5,000	50	1%	0
New Castle Airport	194,000	102,050	53%	731
Summit Airport	170,800	55,100	32%	202
Sussex County Airport	174,500	68,650	39%	332
Total For Alt. 2	**715,600**	**270,250**	**38%**	**1,384**
Alternative 3				
Chorman Airport	53,100	17,300	33%	66
Delaware Airpark	171,300	30,395	18%	41
DelDOT Helistop	5,000	50	1%	0
Dover AFB	230,000	5,520[1]	2%	N/A
Laurel Airport	32,200	11,600	36%	50
New Castle Airport	194,000	101,000	52%	707
Summit Airport	170,800	55,100	32%	202
Sussex County Airport	174,500	44,900	26%	120
Total For Alt. 3	***1,030,900***	**265,865**	**28%[2]**	**1,186**

[1]GA operations only
[2]Although future military use is unknown at Dover AFB, this analysis assumes 24,000 military operations in the year 2030 to calculate the percent of capacity used for the entire system in Alternative 3.

As shown none of the public use airports are projected to reach 60 percent of their capacity by 2030. On an airport level, New Castle uses the most of its available capacity throughout all of the Alternatives and has the highest amounts of delay. Summit and Sussex County Airports will experience the next highest amounts of delay depending on Alternative.

The 2030 state-wide demand in Alternative 1 and 2 are the same, while Alternative 3 assumes that Chandelle Estates, Jenkins, and Smyrna are no longer public use facilities and half of each airport's operations and based aircraft relocate to nearby airports. This decreases the demand in Alternative 3 by 4,385 operations and 35 aircraft (Table 6-3).

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

	Alternative 1	Alternative 2	Alternative 3
Based Aircraft	576	576	541
2030 Demand	270,250	270,250	265,865
Annual Service Volume	915,600	715,600	1,030,900
Percent of Capacity	30%	38%	28%[1]
Annual Delay (Hours)	1,180	1,384	1,186
Surplus Capacity	645,350	445,350	789,035
Percent of Available Capacity	70%	62%	72%

[1]Although future military use is unknown at Dover AFB, this analysis assumes 24,000 military operations in the year 2030 to calculate the percent of capacity used for the entire system in Alternative 3

As shown, Alternative 3 has the greatest surplus airfield capacity (789,035 operations), followed by Alternative 1 (645,350 operations), and then by Alternative 2 (445,350 operations).

Alternative 1 has the second largest Annual Service Volume capacity of all the alternatives. Alternative 3 has the most Capacity because it assumes that full joint use of Dover AFB is achieved which changes the Annual Service Volume of Dover AFB in Alternative 1 from 13,500 operations to 230,000 operations.

Alternative 2 shows the largest percent of capacity used and the largest annual delay due to the assumptions that 5 of the 10 system airports close due to various reasons by 2030 and that Dover AFB will no longer allow public operations. Because of this, demand at each of the closed airports was reallocated to other airports which increases their capacity use and in turn increases their delay. Table 6-3 shows the proposed runway improvements to system airports by the year 2030, while Table 6-4 shows the proposed additional airside facilities for the same time period.

Table 6-3 - Runway Improvements to System Airports: Year 2030			
Airport Name	**Existing Primary Runway Dimensions**	**Future Primary Runway Dimensions**	**Dimensional Upgrade**
Alternative 1			
Chandelle Estates	2,533' x 28'	2,533' x 28'	None
Chorman Airport	3,588' x 40'	3,588' x 40'	None
Delaware Airpark	3,582' x 60'	4,200' x 75'	New Runway and Full Parallel Taxiway
Dover AFB	9,602' x 200'	9,602' x 200'	None
Jenkins Airport[1]	2,842' x 70'	2,842' x 70'	None
Laurel Airport[1]	3,175' x 270'	3,175' x 270'	None
New Castle Airport	7,012' x 150'	7,012' x 150'	None
Smyrna Airport[1]	2,600' x 125'	2,600' x 125'	None
Summit Airport	4,488' x 65'	4,488' x 65'	None
Sussex County Airport	5,000' x 150'	5,500' x 150'	500' in length
Turf Subtotal	*153,466 S.Y.*	*153,466 S.Y.*	*0*
Pavement Subtotal	*493,698 S.Y.*	*502,031 S.Y.*	*58,070 S.Y.*[2]
Total For Alt. 1	**647,164 S.Y.**	**655,497 S.Y.**	**58,070 S.Y.**[2]
Alternative 2			
Delaware Airpark	3,582' x 60'	5,500' x 75'	New Runway & Full Parallel Taxiway
New Castle Airport	7,012' x 150'	7,012' x 150'	None
Summit Airport	4,488' x 65'	4,488' x 65'	None
Sussex County Airport	5,000' x 150'	6,000' x 150'	1,000' in Length & Full Parallel Taxiway
Total For Alt. 2	**256,493 S.Y.**	**295,113 S.Y.**	**85,069 S.Y.**[2]
Alternative 3			
Chorman Airport	3,588' x 40'	3,600' x 60'	New Runway & Parallel Taxiway
Delaware Airpark	3,582' x 60'	4,200' x 75'	New Runway & Full Parallel Taxiway
Dover AFB	9,602' x 200'	9,602' x 200'	None
Laurel Airport1[1]	3,175' x 270'	3,175' x 270'	None
New Castle Airport	7,012' x 150'	7,012' x 150'	None
Summit Airport	4,488' x 65'	5,320' x 65'	832' in Length & Full Parallel Taxiway
Sussex County Airport	5,000' x 150'	6,000' x 150'	1,000' in Length & Full Parallel Taxiway
Turf Subtotal	**95,250 S.Y.**	**95,250 S.Y.**	**0**

Table 6-3 - Runway Improvements to System Airports: Year 2030			
Airport Name	**Existing Primary Runway Dimensions**	**Future Primary Runway Dimensions**	**Dimensional Upgrade**
Pavement Subtotal	**485,818 S.Y.**	**527,667 S.Y.**	**108,524 S.Y.[2]**
Total For Alt. 3	**581,068 S.Y.**	**622,917 S.Y.**	**108,524 S.Y.[2]**

[1] Turf runway. [2] Includes additional runway and taxiway extensions.

Table 6-4 - Additional Airside Facilities, by Alternative*					
Alternative/Airport	**Runway Lighting**	**VASI/PAPI**	**REIL**	**Runway (S.Y.)**	**Taxiway (S.Y.)**
Alternative 1					
Chandelle Estates			2 REIL		
Chorman Airport	MIRL	1 VASI			
Delaware Airpark		2 VASI	2 REIL	35,000	8,626
Jenkins Airport			2 REIL		
Laurel Airport			1 REIL		
Sussex County Airport				8,333	6,111
Total For Alt. 1	**1**	**3**	**7**	**43,333**	**14,737**
Alternative 2					
Delaware Airpark	MIRL	2 VASI	2 REIL	45,833	13,681
Sussex County Airport	MIRL			16,666	8,889
Total For Alt. 2	**0**	**2**	**2**	**62,499**	**22,570**
Alternative 3					
Chorman Airport	MIRL	1 VASI		24,000	6,000
Delaware Airpark	MIRL	2 VASI	2 REIL	35,000	8,626
Summit Airport	MIRL			6,010	3,333
Laurel Airport			1 REIL		
Sussex County Airport	MIRL			16,666	8,889
Total For Alt 3.	**1**	**3**	**3**	**81,676**	**26,848**

* Only airports that have airside needs are shown for each alternative.

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 all pavements with 20-year life spans.

Table 6-5 – Summary of Incremental Airside Alternative Differences			
Airside Facilities	**Alternative 1**	**Alternative 2**	**Alternative 3**
Runway (paving) SY	43,333	62,499	81,676
Taxiway (paving) SY	14,737	22,570	26,848
Runway Lighting (LF)	8,288	6,000	9,632
VASI/PAPI	3	2	3
REIL	7	2	3

LF = Linear Foot

2.3 Landside Service Capability

The landside service capability refers to the ability of Delaware airports to process aircraft and passengers at the hangars and terminal areas of each airport. 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	1,900	8	0	0	0
Chorman Airport	3,700	0	0	500	700
Delaware Airpark	0	29	28,900	0	1,050
DelDOT Helistop	0	0	0	0	0
Dover AFB CAT	63,700	0	0	4,000	3,500
Jenkins Airport	0	0	0	500	0
Laurel Airport	0	0	0	0	0
New Castle Airport	9,900	0	0	0	0
Smyrna Airport	0	4	0	0	0
Summit Airport	0	9	0	0	7,000
Sussex County Airport	0	10	0	0	0
Total For Alt. 1	**79,200**	**60**	**28,900**	**5,000**	**12,250**
Alternative 2					
Delaware Airpark	4,678	70	30,500	0	1,050
DelDOT Helistop	0	0	0	0	0
New Castle Airport	9,900	0	0	0	0
Summit Airport	0	9	0	0	7,000
Sussex County Airport	0	35	0	0	0
Total For Alt. 2	**14,578**	**114**	**30,500**	**0**	**8,050**
Alternative 3					
Chorman Airport	3,700	0	0	500	700
Delaware Airpark	0	44	10,900	0	1,050
DelDOT Helistop	0	0	0	0	0
Dover AFB CAT	63,700	11	19,600	4,000	3,500
Laurel Airport	0	0	0	0	0
New Castle Airport	9,900	0	0	0	0
Summit Airport	0	9	0	0	7,000
Sussex County Airport	0	10	0	0	0
Total For Alt 3.	**77,300**	**74**	**30,500**	**4,500**	**12,250**

By way of explanation, in Alternative 3 Chandelle Estates, Jenkins, Smyrna Airport will no longer be public-use airports. A full BRAC of Dover AFB is not the option considered in Alternative 3 facility needs. Rather, the conservative option of full joint military/civilian use is analyzed. Thus, the CAT would need its planned 63,700 square yards of apron to accommodate civilian air cargo carrier parking. 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)	79,200	14,578	77,300
T-Hangar (Units)	60	114	74
Conventional Hangar Space (SF)	28,900	30,500	30,500
Terminal Building Space (SF)	5,000	0	4,500
Auto Parking (SY)	12,250	8,050	12,250

3. EVALUATION OF AIRSPACE OBSTRUCTIONS

THE STATE HAS AN INTEREST IN THE potential removal of obstructions via State law and regulations that authorize the removal of airspace obstructions from public-use airports in Delaware. Therefore, this section describes the results of the evaluation of airspace obstructions for each of the alternatives and is organized to include the following major topics:

- Existing Airspace Obstructions
- Incremental Changes by Alternative
- Summary and Ranking of Airspace Factors

The product of this evaluation was a set of scores for the airports in each alternative which could be compared via cost analysis. The alternatives could be ranked according to costs and potential public sector funding of obstruction removal.

3.1 Existing Airspace Obstructions and Navaids

The object of this analysis is to learn the differences between the impacts of airspace obstructions and navaids on the aviation system in each alternative. As mentioned in Phase 1 of this study, airspace obstructions are defined by FAR Part 77 – Objects Affecting Navigable Airspace. In Delaware, many of the public-use airports have obstructions of varying severity. Some are lighted for visual reference and avoidance at night. In other cases, runway thresholds have been displaced to permit obstruction clearance in the approach slope of landing aircraft. Other obstructions simply exist and must be avoided by pilots.

Chapter 2, Section 4 of this report contains an inventory of airspace obstructions for each public-use airport in Delaware. Rather than repeat those obstructions here, they are incorporated into this analysis by reference.

Perhaps the easiest method of summarizing the impacts of the need for obstruction removal at existing public-use airports is to present the costs of their removal. This provides a universal comparison factor that is applicable between alternatives, without having to compare the individual obstructions to one another. In previous system planning work, costs were assigned to the removal of obstructions at existing public-use airports. Unit costs for obstruction removal were developed as shown in Table 6-8.

Table 6-8 - Estimated Removal Costs

Work Description	Cost
Lighting Obstruction	$1,700
Power Lines	Case by Case Basis
Clearing/Grubbing/Removal	$14,000/ Acre

Table 6-8 - Estimated Removal Costs	
Off Airport Property	
Cost of Easement Per Acre	$17,000
Removal of Tree in Field	$2,000
Removal of Tree in Yard	$10,000
On Airport Property	
Removal of Tree	$500

Based on these cost assumptions, the following obstruction removal and lighting estimates have been developed for the existing public-use airports in Delaware (Table 6-9). As shown, the cost to remove or light obstructions at these airports has been estimated at more than $11.5 million.

Table 6-9 – Alternative 1 (Existing System) Obstruction Removal Estimates	
Airport	Removal/Lighting Estimate
Chandelle Estates	$1,200,000
Chorman	$612,000
Delaware Airpark	$1,726,000
Jenkins	$2,574,000
Laurel	$727,000
New Castle	$1,451,000
Smyrna	$45,000
Summit	$1,292,000
Sussex County	$1,897,000
Total	$11,524,000

3.2 Incremental Changes by Alternative

Depending upon the number of types of airports included in each alternative, the requirements for obstruction removal will differ. In this regard, Alternative 2 - Contracted Alternative – has fewer airports than the existing system, and thus, a lower obstruction removal cost. Similarly, Alternative 3 – Contingency Aviation System – has fewer public-use airports than the existing system, and thus also lowers overall costs.

Table 6-10 presents the costs of obstruction removal for Alternative 2. As shown, these costs are more than $5 million less than Alternative 1 and represent the reduction in airport facilities requiring obstruction removal. Total cost for Alternative 2 is approximately $6.4 million. With only the publicly owned airports and Summit included in this alternative, most of the significant obstructions have already been removed or lighted. However, according to the LiDAR analysis, the obstructions for which costs were generated still exist and should be removed or lighted.

Table 6-10 – Alternative 2 Obstruction Removal Estimates	
Airport	Removal/Lighting Estimate
Delaware Airpark	$1,726,000
New Castle	$1,451,000
Summit	$1,292,000
Sussex County	$1,897,000
Total	$6,366,000

Table 6-11 presents the obstruction removal costs for the public-use airports included in Alternative 3. This alternative is also less costly than Alternative 1, but because of the inclusion of several privately owned airports, it is more expensive than Alternative 2. Total removal and lighting costs for Alternative 3 are $7.7 million.

Table 6-11 – Alternative 3 Obstruction Removal Estimates	
Airport	Removal/Lighting Estimate
Chorman	$612,000
Delaware Airpark	$1,726,000
Laurel	$727,000
New Castle	$1,451,000
Summit	$1,292,000
Sussex County	$1,897,000
Total	$7,705,000

3.3 Summary and Ranking of Airspace Compatibility Factors

From an evaluation standpoint, the differences between alternatives involved the potential funding needs for the removal of airspace obstructions. In this regard, the overall ranking of alternatives was as follows:

- Alternative 2 First: $6,366,000
- Alternative 3 Second: $7,705,000
- Alternative 1 Third: $11,524,000

These scores indicate that Alternative 2 creates the least impact in obstruction removal requirements, because that alternative has the fewest number of airports. Alternative 1 has the greatest number of public-use airports and thus would require the highest level of obstruction removal. Because the State is considering undertaking some of these removal costs, Alternative 2 clearly has the least impact on funding requirements.

4. IMPACT ON SURFACE TRANSPORTATION

FROM THE PHASE 1 STUDY, A FORECAST of airport-generated surface vehicle traffic was projected to the year 2030 to determine whether or not hourly roadway capacities at each facility would be exceeded. This forecast was for the existing system – essentially Alternative 1. In addition to airport-generated trips, an existing hourly roadway capacity was estimated for each airport. As shown in Table 6-12, projected peak hour vehicle trips will not exceed minimum levels of highway capacity during the planning period for Alternative 1.

Table 6-12 – Alternative 1 Forecast Surface Access Demand

Airport Name	Access Road	2030 Peak Hour Vehicle Trips*	Existing Hourly Roadway Capacity*	2030 Surplus or (Deficit)
Chandelle Estates	Route 9	10	200	190
Chorman	Nine Foot Road	25	200	175
Civil Air Terminal at Dover AFB	Horsepond Road	132	200	68
Delaware Airpark	State Route 42	43	200	157
Jenkins	Westville Road	7	200	195
Laurel	State Route 24	22	200	178
New Castle Airport	US 13 and 40, State Routes 273, 58, 141	206	1,200	994
Smyrna	State Route 6	7	200	193
Summit	US 301	79	400	321
Sussex County	Airport Road, S Railroad Ave	65	400	335

* Vehicle trips estimated from general aviation industry averages of 2.35 times peak hour operations. This number accounts for pilots, passengers, and employees at the airport.

** Estimated minimum capacity of 200 hourly vehicles for airport ingress and egress turn lanes

4.1 Aviation Demand Generated Vehicle Trips

Table 6-13 presents the forecast vehicle trips for Alternatives 1, 2, and 3, given the different forecast aviation demand projected for each scenario. As shown, there are minimal differences in overall peak hour vehicle trips for most alternatives. Notably, there are a number of airports missing from Alternative 2, by definition. However, of the airports with the least surplus capacity, the Civil Air Terminal at Dover AFB shows the use of 66 percent of its capacity in Alternatives 1 and 2. In Alternative 3, that increases to a potential range of 70-155 percent of capacity, depending upon whether or not airline service is attracted to the CAT. While there are other airports that have significant roadway capacity available for aviation-related

demand, it should be noted that non-aviation demand will increase on these highways in the future as well. In fact, the non-aviation demand is much higher in most cases than the aviation-generated demand.

Table 6-13 – 2030 Aviation-Related Peak Hour Vehicle Trips by Alternative

Airport Name	Alternative 1	Alternative 2	Alternative 3
Chandelle Estates	10	0	5
Chorman	25	0	25
Civil Air Terminal at Dover AFB	132	0	141-310*
Delaware Airpark	43	61	45
Jenkins	7	0	7
Laurel	22	0	22
New Castle	206	206	206
Smyrna	7	0	7
Summit	79	79	79
Sussex County	73	94	73

* Upper range would include potential airline service and air cargo operations at the CAT.

4.2 Total Traffic Counts

As described in Phase 1 of the System Plan, future traffic counts were provided by DelDOT for the roadways involved in direct surface access to Delaware's system airports. These projections can be considered a worst case loading for the system plan. For comparison purposes the 2010 Annual Average Daily Traffic is also shown along with the percentage growth over the period:

- Chandelle Estates
  - Silver Leaf Lane – 168 AADT **(240 Projected, +42.9%)**
  - State Route 9 – 1,289 AADT **(1,750 Projected, +35.8%)**
- Chorman
  - Nine Foot Road – 793 AADT (1,030 Projected, +29.9%)
  - U.S. Route 13 – 23,901 AADT (35,900 Projected, +50.2%)
- Civil Air Terminal at Dover AFB
  - Horsepond Road – 1,898 AADT **(2,100 Projected, +10.6%)**
- Delaware Airpark
  - State Route 42 – 5,262 AADT **(7,700 Projected, +46.3%)**
- Jenkins
  - Westville Road – 2,735 AADT **(4,000 Projected, +46.3%)**
- Laurel
  - Sharptown Road – 1,610 AADT **(2,300 Projected, +42.9%)**

- New Castle Airport
  - U.S. 40/DuPont Highway – 77,366 AADT **(95,000 Projected, +22.8%)**
  - U.S. 202/E. Basin Road (State Route 141) – 41,783 AADT **(63,000 Projected, +50.8%)**
  - Commons Boulevard/State Route 37 – 18,645 AADT **(25,500 Projected, +36.8)**
  - Airport Road – 9,320 AADT **(14,000 Projected, +50.2%)**
  - Churchmans Road/State Route 58 – 10,267 AADT **(15,000 Projected, +46.1%)**
  - Old Churchmans Road – 712 AADT **(800 Projected, +12.4%)**
- Smyrna
  - Commerce Street/State Route 6 – 1,807 AADT **(2,000 Projected, +10.7%)**
- Summit
  - U.S. 301 – 21,798 AADT **(28,000 Projected, +28.5%)**
- Sussex County
  - Road 319 – 941 AADT **(1,050 Projected, +11.6%)**
  - U.S. Route 9 – 13,139 AADT **(17,500 Projected, +33.2%)**
  - U.S. Route 9T – 4,995 AADT **(7,500 Projected, +50.2%)**

Except for New Castle Airport, many of the high growth rates involve relatively low activity roadways. For example, Silver Leaf Lane is growing from an AADT of 168 to 240 – only 72 vehicles per day. At Delaware Airpark, State Route 42 is projected to grow by 2,438 AADT. But this is significantly less than the large numbers surrounding New Castle Airport, described previously. U.S. 301, which provides access to Summit Airport, is anticipated to grow from 21,798 to 28,000 over the period. This growth will increase the difficulty of turning left into the airport without a stop light to assist traffic across the southbound lanes.

In cases where a roadway leads directly to an airport entrance (Old Churchmans at New Castle Airport, Horsepond Road at the Civil Air Terminal, and Road 319 at Sussex County Airport) all have growth rates under 13 percent. These projections can be associated with Alternative 1 of the System Plan. Increases in airport activity in either Alternative 2 or 3 may increase these numbers and percentages. For example, a new terminal area off Old Churchmans Road would significantly increase that level of traffic. Similarly, a new air cargo operation or new airline service at the Civil Air Terminal would significantly impact those projected surface access numbers.

4.3 Surface Access Evaluation Findings

For this analysis, the findings for surface access needs and potential improvements were limited to the immediate access of each airport within the various alternatives and did not cover the general needs of highways leading to the system airports. Rather, the findings and recommendations focused on the impacts of each alternative on the surface accessibility of system airports. From the evaluation, the following key findings were made:

- Civil Air Terminal
  - Under Alternative 1, the Civil Air Terminal existing roadway system will be adequate for the long term future.
  - Under Alternative 2, it is assumed that the Civil Air Terminal is closed to public use due to security or other reasons. As such, no surface access aviation-related demand is generated.
  - Under Alternative 3, if airline service is initiated, a potential of 300 peak hour vehicles are possible for Horsepond Road. This will hasten the need for capacity-relief improvements including turn lanes, road widening, and increased parking area at the CAT. A minimum of 150 new auto parking spaces will be needed if airline service materializes. Also for Alternative 3, full joint use of Dover AFB is assumed. Therefore, up to five business jets and 31 propeller aircraft are forecast for the facility, increasing the total number of potential peak hour vehicle trips by 9. Finally, if domestic air cargo service is initiated, the roadway system connecting the CAT to State Route 1 will need to be improved for truck traffic. This would include possible widening and strengthening of the roadways connecting to Route 1 (Horsepond Road and Lafferty Lane).

- Delaware Airpark
  - No significant changes to the surface access are anticipated or required for this airport under any of the three alternatives. On-airport traffic levels are only anticipated to grow to 61 peak hour vehicles by 2030 for Alternative 2, which is the highest level of demand of any of the options. This level of demand is only 30 percent of the entrance roadway capacity.
  - At least 20 more airport auto parking spaces will be needed by 2030.

- New Castle Airport
  - There are no significant changes between alternatives for this airport, as all have the same forecast demand. Thus, whatever happens at this facility can be assumed to occur within each of the alternatives.
  - At some point in the future, airline service is likely to be initiated at New Castle Airport due to overcrowding at Philadelphia International. If this occurs prior to 2030, new surface access improvements will be needed at the airport, including access to the new terminal area and significant expansion of auto parking.

- Summit Airport
  - There are no significant changes between alternatives for this airport, as all have the same forecast demand. Thus, whatever happens at this facility can be assumed to occur within each of the alternatives.
  - Summit Airport will continue to grow its maintenance, avionics, and aircraft retrofitting businesses, along with its government contracts. As such, the airport is anticipated to increase its employment base over the planning period. Airport

management has estimated that this growth may create up to 600 new jobs. Given the new employment numbers, surface access to the airport may need improvement, including a traffic light at the main airport entrance in the intermediate planning timeframe to accommodate peak period traffic that would occur during the start and end of work shifts at the airport. In addition, it is anticipated that at least 500 more auto parking spaces would be required as the number of employees and visitors to the airport increase.

- Sussex County Airport
  - Under all alternatives there are no new surface access needs that would be triggered by vehicle trips to the airport. The highest level of access road peak hour capacity used is 47 percent under Alternative 2.
  - Under Alternative 3, it is assumed that the primary runway will be extended to 6,000 feet. This will trigger the need to relocate a portion of U.S. 9T (Park Avenue), changing the intersection location of S. Bedford Street and Park Avenue. This change will not impact highway capacities, but will permit the runway extension to occur.

- Other Public-Use System Airports: Chandelle Estates, Chorman Airport, Jenkins, Laurel, and Smyrna Airport are not anticipated to create significant surface access demand throughout the period under any of the Alternatives.

5. ENVIRONMENTAL & LAND USE COMPATIBILITY

FOR THIS EVALUATION CRITERION, LAND USE COMPATIBILITY is sometimes measured by the real estate value established in the near-airport environs. Noise impact, in particular, is blamed by many to cause a devaluation of real estate. Thus, the impact of airport operations on environmental and land use compatibility can be measured indirectly by determining average real estate values in the airport area as compared with other areas of a community that are not impacted by airport noise. If the conventional wisdom holds, the property in the near-airport areas should average significantly less in value from similar land uses that are not impacted by airports.

In Delaware, an analysis was completed that examined the data concerning the value of different types of real estate located near airports and similar properties located away from the influence of airport-related noise. The purpose was to learn which alternatives have the greatest impact on land use compatibility. This impact will be measured by the potential differences in airport area land values between alternatives.

5.1 Evaluation Concepts

The impacts of aviation on real estate values are active on a large scale. Airports that attract businesses to an area stimulate commercial real estate and create jobs. Increased employment in turn, causes growth in retail, industrial, office, and residential real estate. Thus, aviation is one industry that supplements economic growth and the demand for real estate. The question posed by this analysis involves whether or not airports help or hurt real estate values in their immediate vicinity. If noise really is the environmental influence that aviation opponents claim, then *residential* property values should suffer as the size and activity of an airport increases. On the other hand, *commercial* property may not be subject to this hypothesis.

Concepts that are evaluated in this analysis include the impact of airport operations on both commercial and residential real estate values. The results are presented in the following sections.

5.2 Commercial Property Values

Delaware's four NPIAS airports proved to be the most viable for this type of study, as other privately owned airports did not have enough commercial properties located adjacent to airport property to draw meaningful conclusions. Therefore, the in-depth examination of commercial real estate values focused on the following Airports:

- New Castle Airport
- Sussex County Airport

- Summit Airport
- Delaware Airpark

Commercial properties within a five mile radius of each airport were evaluated, based on their proximity to the airports' runway areas. This study area was then divided into sections from closest to farthest away from the airport. Figure 6-1 depicts these sections divided into rings.

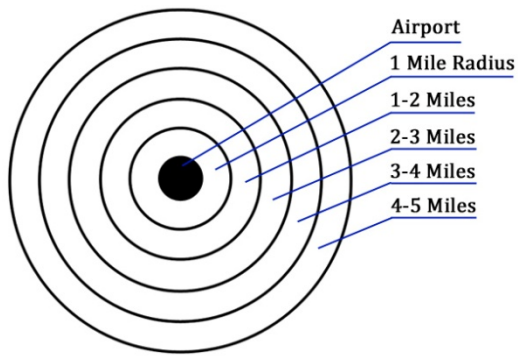


Figure 6-1 – Airport Real Estate Analysis Area

With sections divided in this manner, conclusions can be drawn about property values - specifically with relation to the distance from airports. The end goal is to identify a trend in the difference in property values within the divided sections. For example, if property values are consistently higher in the inner sections close to an airport, and lower in the outer sections away from the airport, one could make the determination that the airport is a positive influence on property values in that area. Of course, if property values were consistently lower in the inner rings and higher in the outer rings, the reverse would be true. One question for this analysis is whether or not there is any difference between commercial property values near an airport and residential property values.

For this report, commercial real estate values were collected from the CoStar.com real estate database. This resource allows for the collection of commercial real estate data by geographical location, and is able to separate findings by the categories of Industrial, Office, and Retail space. For this study, average sale price per square foot was the metric used to evaluate value.

To conduct the analysis, all commercial property data within a five-mile radius of an airport was collected and divided into sections based on proximity to the airport. The properties were analyzed by category to provide an understanding of an airport's influence on commercial property values. It is important to note that within this report, all commercial real estate values were current as of April 2012.

New Castle Airport

Figure 6-2 presents a geographical summary of average property values surrounding New Castle Airport. As shown in Figure 6-2 and Table 6-14, commercial real estate within a five mile radius of New Castle International Airport is priced at a higher value closer to the airport. The highest value commercial real estate is within the segment one mile around the airport, priced at an average of $150 per square foot. The segment with the lowest real estate value is

within the 4-5 mile segment, averaging $80 per square foot. This represents an 85.7 percent increase from the outermost segment to the innermost.

Figure 6-2 - Commercial Real Estate Surrounding New Castle Airport

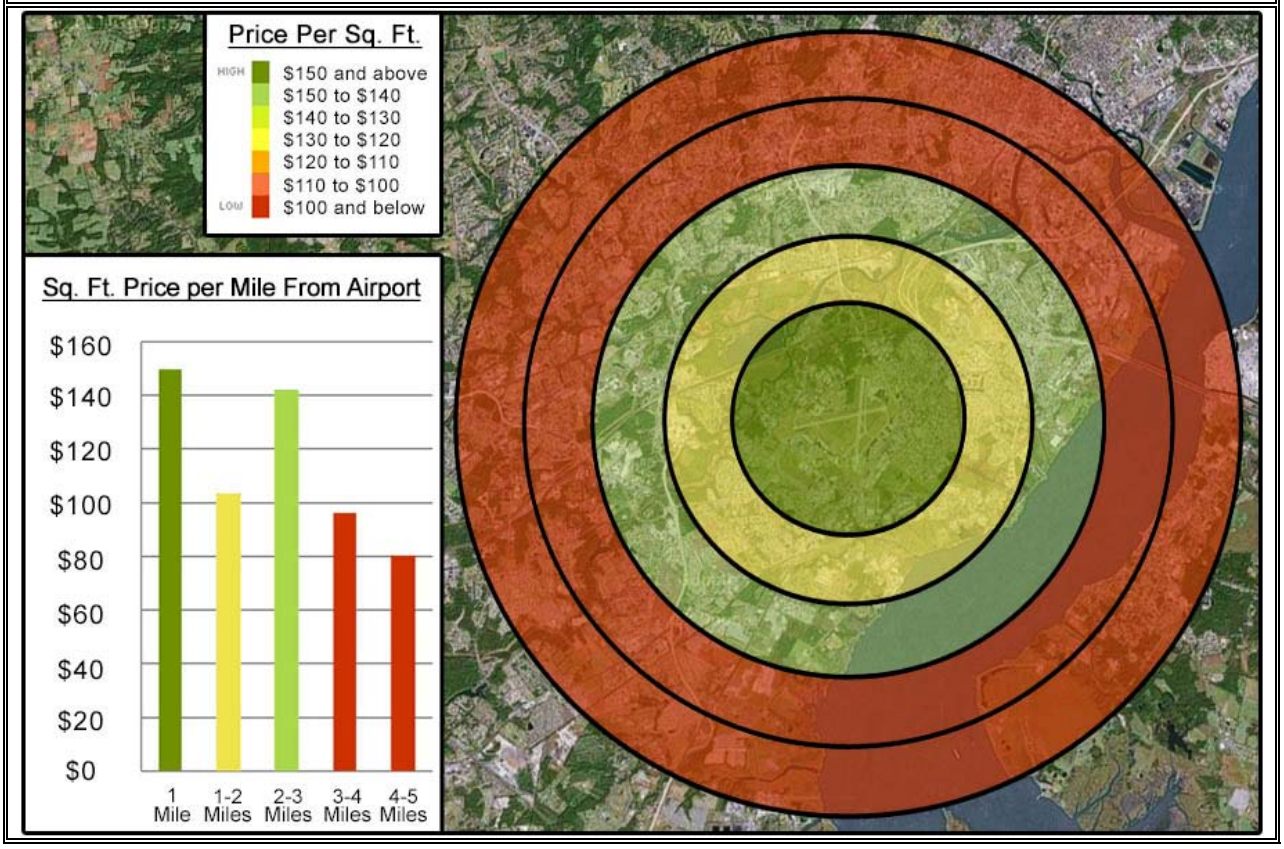


Table 6-14 - Commercial Real Estate Surrounding New Castle Airport					
	1 Mile	**1-2 Miles**	**2-3 Miles**	**3-4 Miles**	**4-5 Miles**
Properties by Segment					
Industrial (682)	141	149	97	193	102
Office (601)	54	46	80	148	273
Retail (1,052)	132	117	129	306	368
Total (2,335)	***327***	***312***	***306***	***647***	***743***
Average Price Per Sq. Ft.					
Industrial	$58	$49	$64	$57	$41
Office	$142	$166	$214	$106	$85
Retail	$251	$148	$156	$116	$88
Total Weighted Average	***$150***	***$103***	***$142***	***$96***	***$80***

The 3-4 and 4-5 mile segments contained the highest number of commercial properties, with 647 and 743 properties respectively. This outcome is to be expected as these segments cover a much greater surface area than the segments directly adjacent to the airport. Retail spaces occupy the majority of commercial real estate within a five mile radius of the airport with

1,052 properties. Office and Industrial spaces were fairly even in numbers with 601 and 682 properties respectively. With a total of 2,335 commercial properties, the New Castle Airport study area provides an excellent sample size that definitively portrays commercial real estate trends. Conclusively this represents that the airport and its noise do not negatively impact the values of commercial real estate. While residential real estate values may have a different result, it can be concluded that commercial real estate is compatible with airport operations, from an economic standpoint. In fact, the data shows that New Castle Airport provides a very healthy environment for businesses to thrive, particularly those closer to the airport.

Sussex County Airport

Figure 6-3 presents a geographical summary of average commercial property values surrounding Sussex County Airport. As shown, there is a lack of commercial real estate data for at least one geographic segment in the airport area. Though one industrial property was examined in the 3-4 mile segment, no pricing information was available for that property. Therefore, it was not taken into consideration in calculating the total weighed average price per square foot. This same issue was recognized for industrial properties in the 1-2 mile and 4-5 mile segments.

Table 6-15 shows the breakdown of properties and costs by geographic location. Commercial property values closest to the airport showed the least expensive pricing in the study area, averaging $121 per square foot. The highest commercial property pricing was in the 2-3 mile segment, averaging $318 per square foot. This represents commercial values that are over twice as expensive as properties adjacent to the airport. However, many of these properties are located in the downtown area of Georgetown and as such, are not entirely indicative of the airport's actual influence. Specifically, the 2-3 mile segment was only made up of 11 properties, four of which were valued at an average $499 per square foot. This number is extraordinarily high, and does not necessarily represent normal pricing within the 2-3 mile segment.

It is important to note that the area within one mile of the airport contained a greater number of commercial properties than any other segment with 57 properties. This represents only 10 fewer properties than all other segments in the study area combined. The low sample sizes from other segments does not allow for conclusively regarding price per square foot, as they may not accurately represent the actual norms in those areas. However, the relative high density of commercial properties near the airport indicates that relatively speaking, the land surrounding the airport is attracting more businesses than other segments in the study area.

Figure 6-3 - Commercial Real Estate Surrounding Sussex County Airport

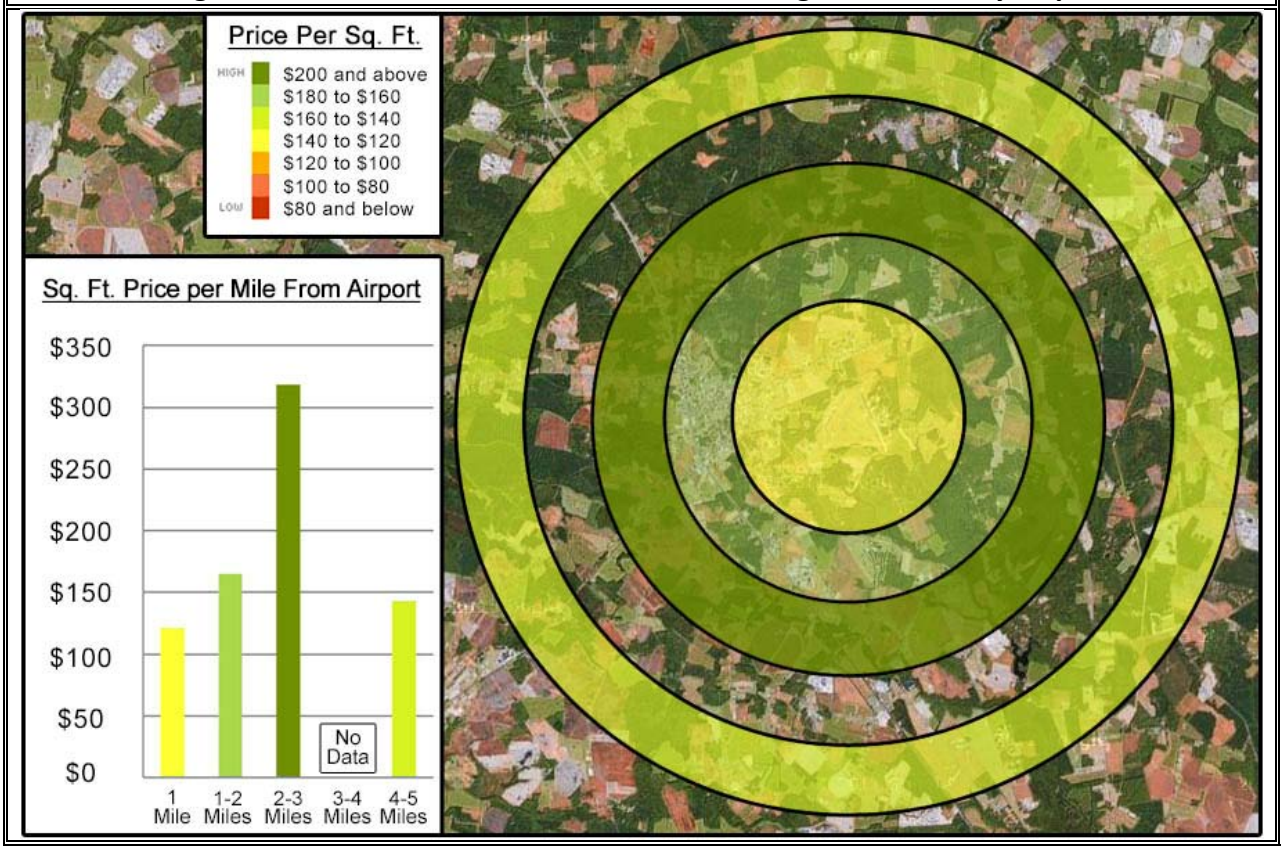


Table 6-15 - Commercial Real Estate Surrounding Sussex County Airport					
	1 Mile	**1-2 Miles**	**2-3 Miles**	**3-4 Miles**	**4-5 Miles**
Properties by Segment					
Industrial (31)	20	4	2	1	4
Office (57)	22	23	4	0	8
Retail (36)	15	13	5	0	3
Total (124)	***57***	***40***	***11***	***1***	***15***
Average Price Per Sq. Ft.					
Industrial	$100	NA	$130	NA	NA
Office	$122	$137	$499	NA	$125
Retail	$149	$215	$249	NA	$194
Total Weighted Average	***$121***	***$165***	***$318***	***NA***	***$143***

Summit Airport

Due to lack of information, little can be concluded about the commercial property surrounding Summit Airport. While research findings indicate that there are retail properties adjacent to the airport, there was no pricing information readily available. Most of the properties in the study area were located in the 4-5 mile segment, which passed directly through the business center of Middletown. Because of the airport's location and lack of sufficient data, no

conclusions could be made about the direct effect of Summit Airport on nearby commercial real estate. Figure 6-4 presents a geographical summary of average property values surrounding Summit Airport, while Table 6-16 shows the breakdown of properties and costs by geographic location.

Figure 6-4 - Commercial Real Estate Surrounding Summit Airport

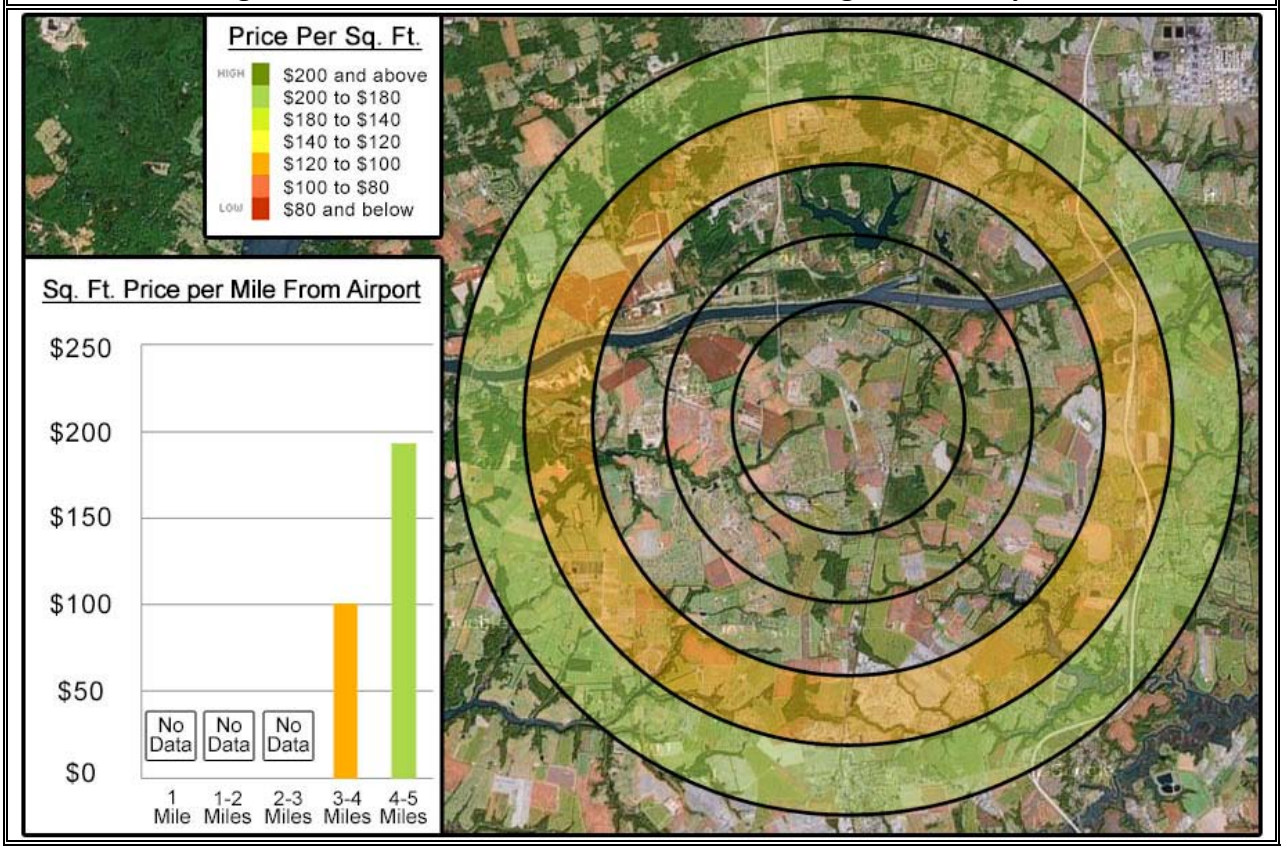


Table 6-16 - Commercial Real Estate Surrounding Summit Airport

	1 Mile	1-2 Miles	2-3 Miles	3-4 Miles	4-5 Miles
Properties by Segment					
Industrial (7)	0	0	0	2	5
Office (63)	0	0	16	13	34
Retail (89)	6	1	4	8	70
Total (159)	***6***	***1***	***20***	***21***	***104***
Average Price Per Sq. Ft.					
Industrial	NA	NA	NA	NA	NA
Office	NA	NA	NA	$111	$206
Retail	NA	NA	NA	$83	$160
Total Weighted Average	***NA***	***NA***	***NA***	***$100***	***$175***

Delaware Airpark

Figure 6-5 presents a geographical summary of average property values surrounding Delaware Airpark, while Table 6-17 shows the breakdown of properties and costs by geographic location.

Figure 6-5 - Commercial Real Estate Surrounding Delaware Airpark

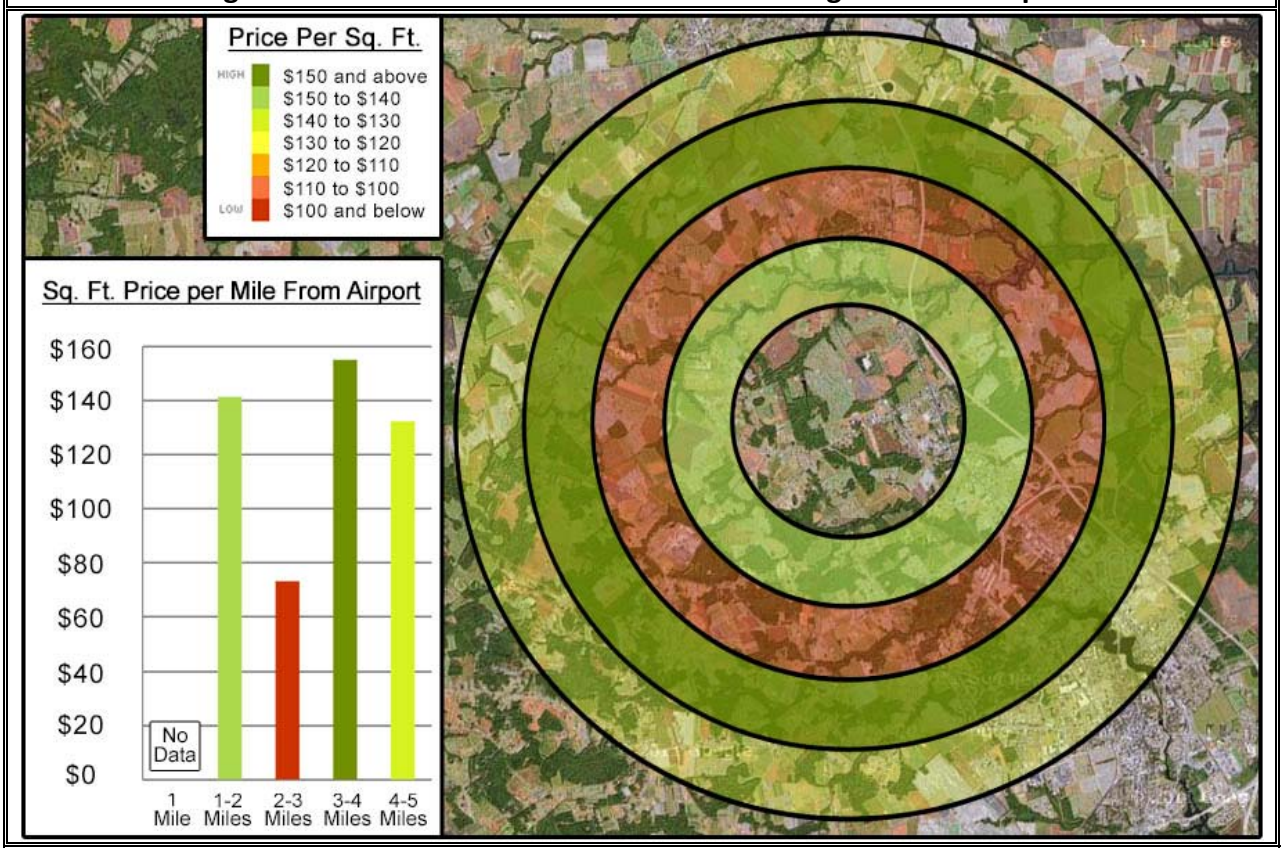


Table 6-17 - Commercial Real Estate Surrounding Delaware Airpark					
	1 Mile	**1-2 Miles**	**2-3 Miles**	**3-4 Miles**	**4-5 Miles**
Properties by Segment					
Industrial (46)	4	14	8	5	15
Office (106)	0	10	9	8	79
Retail (210)	4	38	25	30	113
Total (362)	***8***	***62***	***42***	***43***	***207***
Average Price Per Sq. Ft.					
Industrial	NA	$161	$45	$86	$122
Office	NA	NA	$171	NA	$89
Retail	NA	$134	$46	$167	$163
Total Weighted Average	***NA***	***$141***	***$73***	***$155***	***$132***

The one mile adjacent to the airport showed the lowest amount of commercial real estate with only eight properties. With this small sample size, no pricing information was available.

However, the 1-2 mile segment showed a significant number of industrial and retail establishments. The highest concentration of commercial real estate was within the 4-5 mile segment, with 207 properties. This result is primarily made up by properties in downtown Dover, and some within the town of Smyrna. It is difficult to compare these properties to commercial real estate nearby the airport, given its location in the town of Cheswold.

It is also important to note the proximity of Dover Air Force Base to the study area surrounding Delaware Airpark. Normally, commercial properties on the outermost segments of a study area represent properties not affected by airport noise. Unfortunately, the outermost segments in this case clearly overlap into geographical areas directly affected by Dover AFB. As a result, the study area encompassed properties from different towns near different airports. While 362 properties made up a useable sample size, the apples-to-oranges comparison was difficult to decipher with regard to airport-impacted land values.

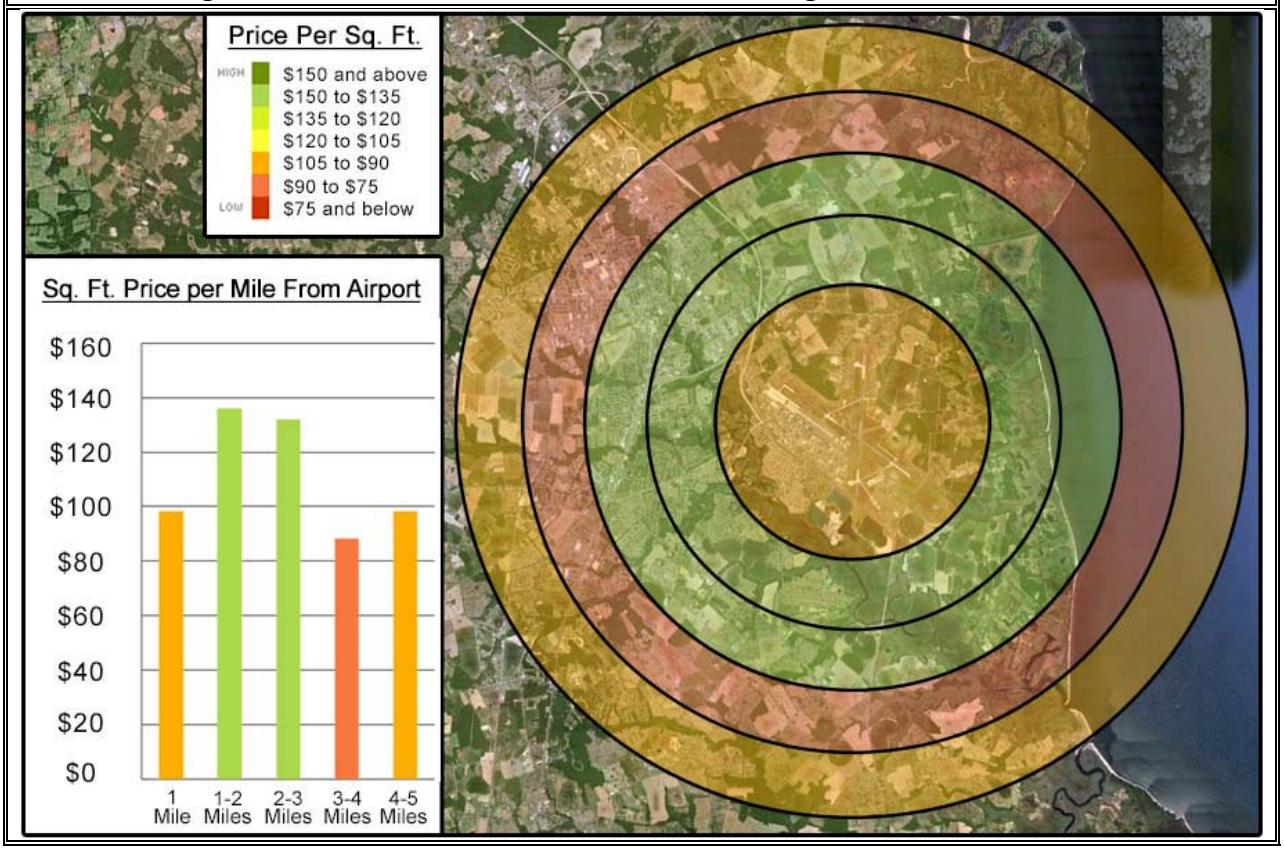
Civil Air Terminal at Dover Air Force Base

Figure 6-6 presents the graphic display of real estate values surrounding the Civil Air Terminal, while Table 6-18 lists the data used in developing the Figure. As previously mentioned, the study area for the Civil Air Terminal at Dover AFB overlaps with the study area surrounding Delaware Airpark. Not surprisingly, the commercial real estate data results varied across each study area segment. The highest values per square foot were found within the 1-2 mile and 2-3 mile segments, which covered the area through downtown Dover. In addition to this, these segments had the fewest amount of low value industrial properties, which considerably affected the averages of the other segments. The 2-3 mile segment showed the highest density of commercial properties, far outnumbering all other segments combined with 338 properties. These properties were primarily composed of office and retail spaces.

Table 6-18 - Commercial Real Estate Surrounding CAT

	1 Mile	1-2 Miles	2-3 Miles	3-4 Miles	4-5 Miles
Properties by Segment					
Industrial (65)	12	5	9	25	14
Office (309)	2	39	165	86	17
Retail (395)	20	69	164	110	32
Total (769)	***34***	***52***	***338***	***35***	***63***
Average Price Per Sq. Ft.					
Industrial	$45	NA	$63	$44	$64
Office	NA	$155	$129	$101	$121
Retail	$129	$126	$139	$88	$100
Total Weighted Average	***$98***	***$136***	***$132***	***$88***	***$98***

Figure 6-6 - Commercial Real Estate Surrounding the Civil Air Terminal



Summary and Findings for Commercial Real Estate

Though a lack of sufficient data was apparent at some airports, useful conclusions may be drawn from this analysis. The results from the New Castle Airport study area proved to have the clearest findings. From this data a great deal can be concluded about the airport's effect on commercial real estate. Significantly higher commercial property values closer to the airport indicate that in Wilmington, New Castle Airport has had a positive influence on commercial land prices.

Sussex County, with the lowest sample size of 124 properties, showed a much higher density of commercial real estate within one mile of the airport than all other segments in its study area. Delaware Airpark, with no pricing information within one mile of the airport had the second highest commercial real estate value in its study area within the 1-2 mile segment. While a lack of pricing information was available for commercial properties near Summit Airport, there is a thriving, high-end residential community surrounding the airport that warrants further study.

While there are many factors that contribute to commercial real estate prices, there does appear to be an overall positive trend with commercial real estate value and proximity to an

airport. Some factors not considered in the above analysis included the number of operations at each airport, the size of each airport, and the actual level of noise generated by aviation activity. It is possible that airports with higher operational counts could have a greater positive influence on commercial real estate values. While these results concerning commercial real estate can be considered positive, additional research is needed to assess the effect of airports on surrounding residential properties.

5.3 Residential Property Values

In addition to commercial property values, it was determined that an examination of residential property values was needed. Thus, the residential property values surrounding the following ten aviation facilities were examined:

- New Castle Airport
- Sussex County Airport
- Summit Airport
- Delaware Airpark
- Civil Air Terminal at Dover AFB
- Chorman Airport
- Laurel Airport
- Chandelle Estates
- Smyrna Airport
- Jenkins Airport

Like commercial real estate, data was collected on property values directly surrounding the airport. Because of limitations regarding the collection of this data, a sampling method had to be utilized. A control group of properties similar in size and surroundings were examined within the 4-5 mile segment surrounding the airport.

As an illustration, determining the effect of an airport on properties adjacent to an airport would involve studying those same houses in a similar neighborhood without the airport present. To best replicate this process, the study compared the difference in price per square foot between properties adjacent to the airport and similar properties farther away. It was assumed that the variable of airport activity would be removed from the sample group farther away, and the difference (if any) in price per square foot would represent the effect of airport activity on property value.

Because the control group of houses should simulate the conditions next to the airport, it is of vital importance that samples be chosen carefully. For an airport surrounded by dense housing, it would be unreasonable for the control group to be made up of agricultural dwellings and vice versa. Rather, the sampling of real estate properties was made to select residential homes that had very similar characteristics at both the airport and control group

locations. Land within a 4-5 mile radius from each airport was determined to be the boundary for the selection of control group properties. These properties are close enough to be within the same community without being directly affected by aircraft noise.

To research property values by geographical distance to Airports, the database at www.homes.com was used. The home valuation process for this resource combines tax assessment values with recent home sales data to produce market value estimates used for property evaluation. From this, an average price per square foot was determined for each set of selected properties. In total, 6,208 properties were examined for the residential analysis of Delaware public-use airports, with sample sizes varying by airport. New Castle had the largest sample size with 1,878 properties, and Chorman Airport had the smallest sample size with 110 properties. For each airport, two percent of the properties examined (representing the highest and lowest values) were removed when calculating final averages to exclude statistical outliers. It is also important to note that property values for apartments and condominiums were not taken into account for this study.

New Castle Airport

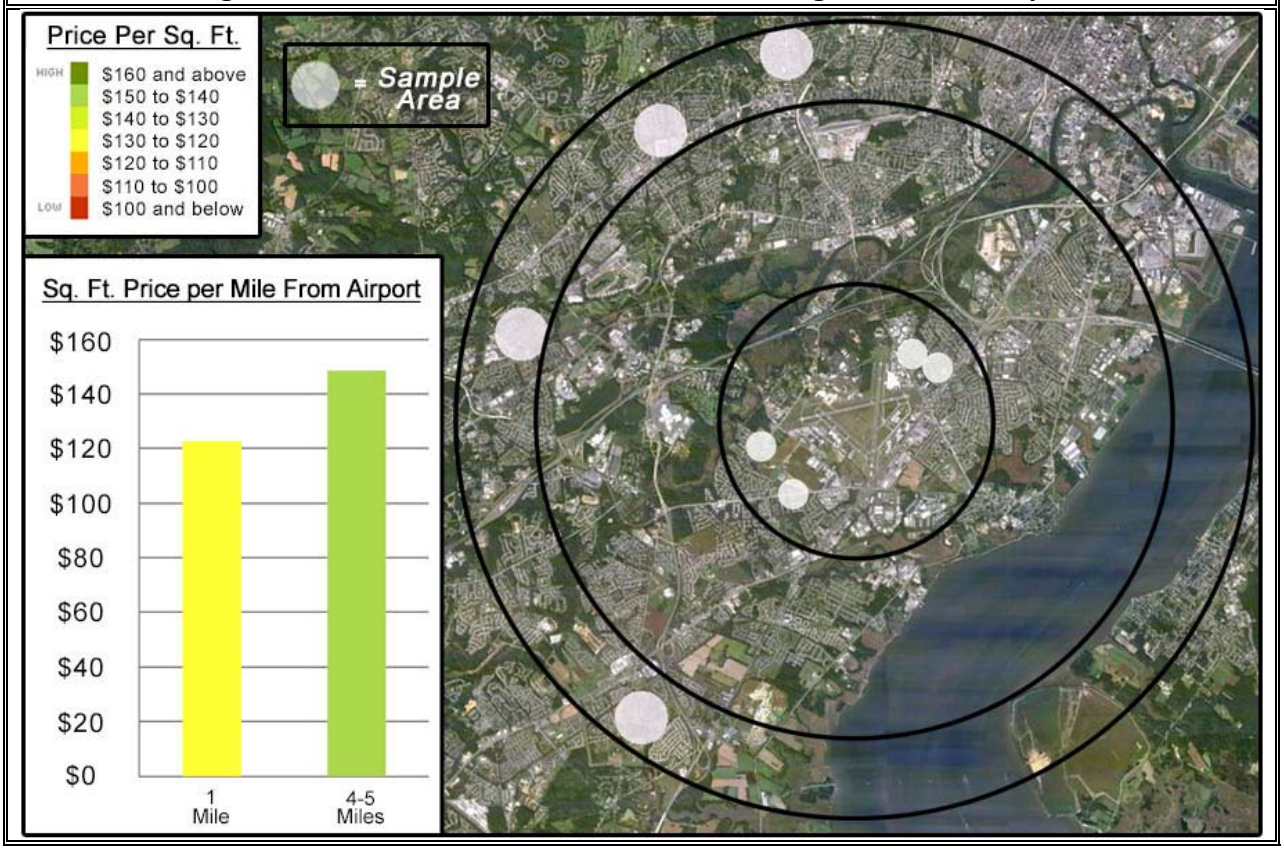
Figure 6-7 displays the sampling areas utilized for New Castle Airport. Because of the high density of residential properties within the study area, sample areas were selected to best represent average property values near the airport. In the 4-5 mile segment, properties were sampled that were similar in size and surroundings to those found within one mile of the airport to allow for property value comparison.

Table 6-19 shows the study results for New Castle Airport, with property values adjacent to the airport averaging 18 percent lower value per square foot than properties sampled within the 4-5 mile range. New Castle Airport contained the largest sample size of any other airport in this study, with 990 properties averaging $122 per square foot within one mile of the airport and 888 properties averaging $148 per square foot within 4-5 miles of the airport.

Table 6-19 - Residential Real Estate Surrounding New Castle Airport

	1 Mile Properties	4-5 Mile Properties	Price Difference (%)
Properties by Segment	990	888	
Average Price Per Sq. Ft.	**$122**	**$148**	**-18%**
Average Property Size	1,244 Sq. Ft.	1,396 Sq. Ft.	

Figure 6-7 - Residential Real Estate Surrounding New Castle Airport



Sussex County Airport

For Sussex County Airport, all residential properties within one mile were able to be examined due to the smaller amount of properties available. Figure 6-8 shows the sample areas utilized within the 4-5 mile segment that closely resemble residential properties adjacent to the airport.

As shown in Table 6-20, very little difference in property values were recorded between properties near the airport and those farther away. Within one mile of the airport, property values only averaged one percent lower than those within the 4-5 mile segment. This defies the conventional wisdom that all airports negatively affect residential real estate value. The sample size for Sussex County Airport analysis consisted of 278 properties. Within one mile of the airport the average price per square foot was $121, while similar properties not affected by the airport averaged $122 per square foot.

Figure 6-8 - Residential Real Estate Surrounding Sussex County Airport

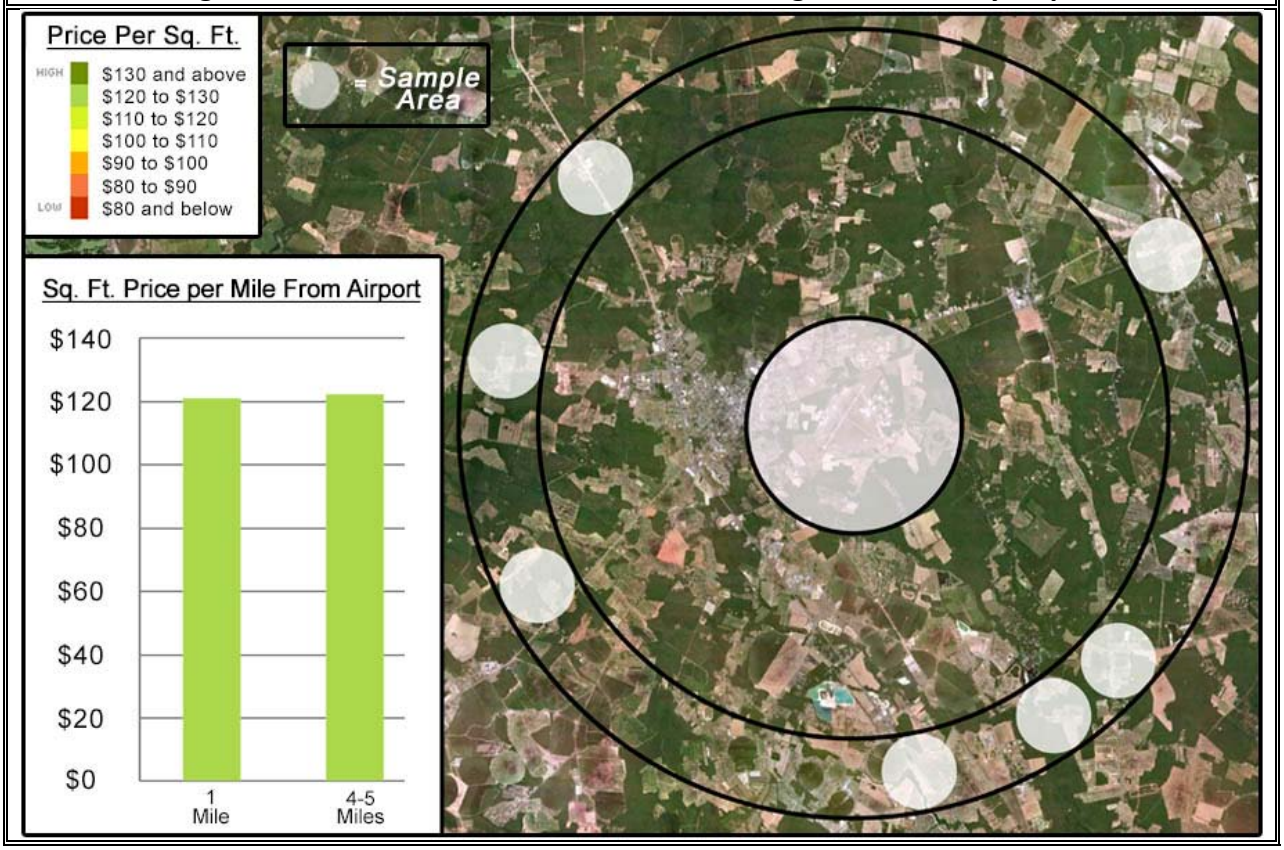
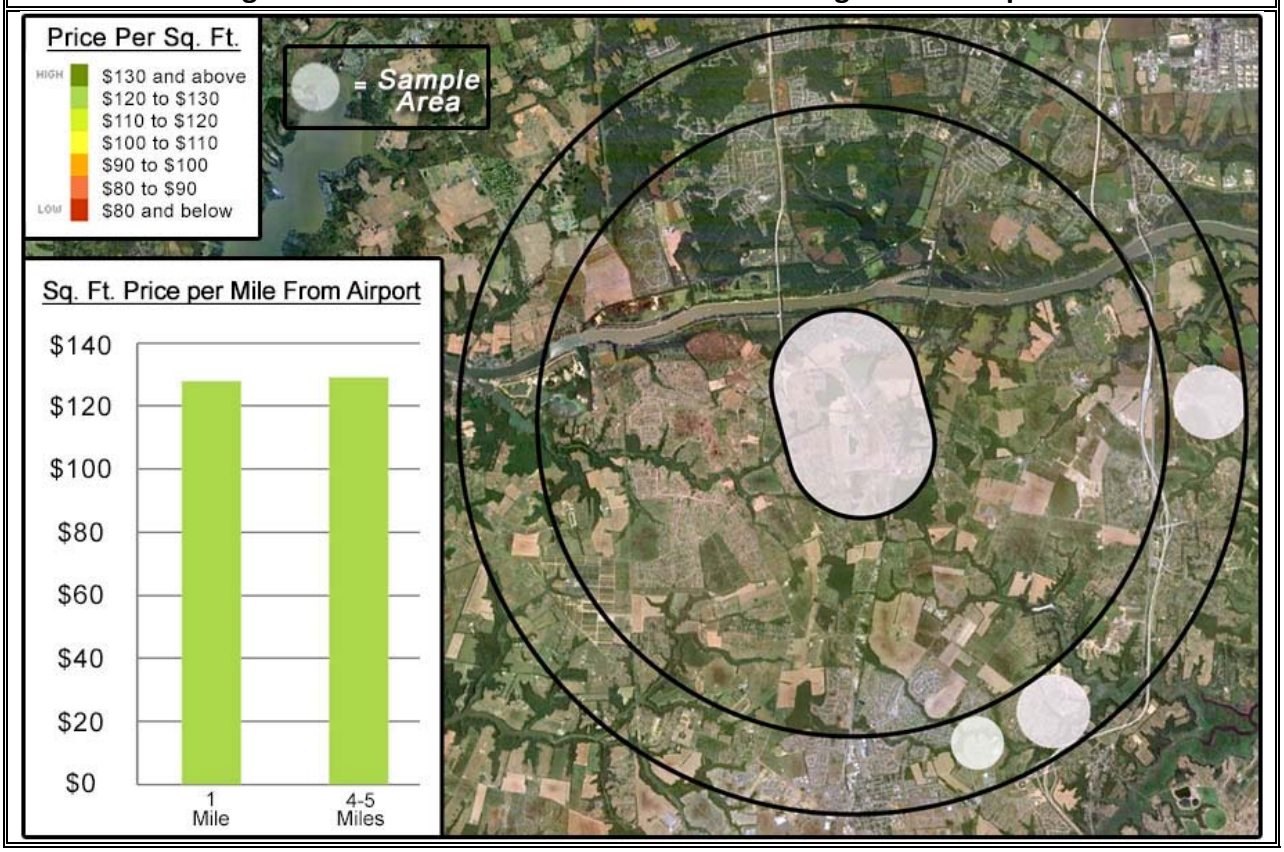


Table 6-20 - Residential Real Estate Surrounding Sussex County			
	1 Mile Properties	**4-5 Mile Properties**	**Price Difference (%)**
Properties by Segment	174	104	
Average Price Per Sq. Ft.	**$121**	**$122**	**-1%**
Average Property Size	1,841 Sq. Ft.	1,872 Sq. Ft.	

Summit Airport

Because the study area is defined as properties within one mile of airport runways and Summit Airport consists of only one main runway, the shape of the study area adjacent to the airport differs from other airports examined. While not perfectly circular, the study area accurately covers all properties within one mile of Summit's main runway. Figure 6-9 shows this study area, as well as the sample areas within the 4-5 mile segment that replicate the housing environment adjacent to the airport.

Figure 6-9 - Residential Real Estate Surrounding Summit Airport



The residences immediately surrounding Summit Airport were the largest of any airport in the study, averaging 2,547 square feet within one mile of the airport. These high end residential properties were compared to other large residences outside of direct airport influence. As shown, the overall price difference of one dollar per square foot does not indicate that Summit Airport is negatively affecting properties near the airport.

Table 6-21 - Residential Real Estate Surrounding Summit Airport

	1 Mile Properties	4-5 Mile Properties	Price Difference (%)
Properties by Segment	372	421	
Average Price Per Sq. Ft.	**$128**	**$129**	**-1%**
Average Property Size	2,547 Sq. Ft.	2,490 Sq. Ft.	

Delaware Airpark

Figure 6-10 shows the sample areas used to represent the average residential property values surrounding Delaware Airpark. The data collected show little difference between properties within a one mile radius of the airport and similar samples outside away from any airport influence; averaging $109 per square foot within one mile of the airport, and $110 per square foot within 4-5 miles of the airport.

Figure 6-10 - Residential Real Estate Surrounding Delaware Airpark

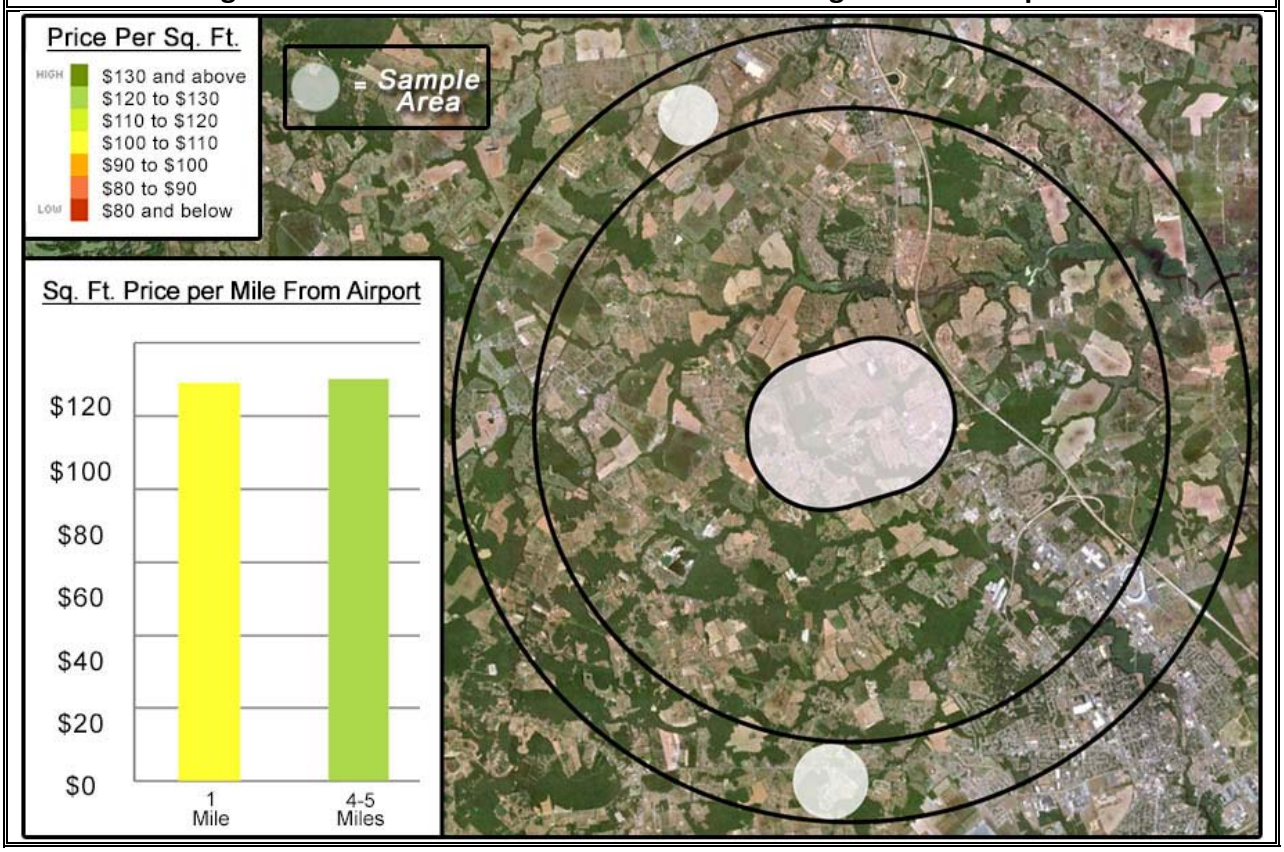
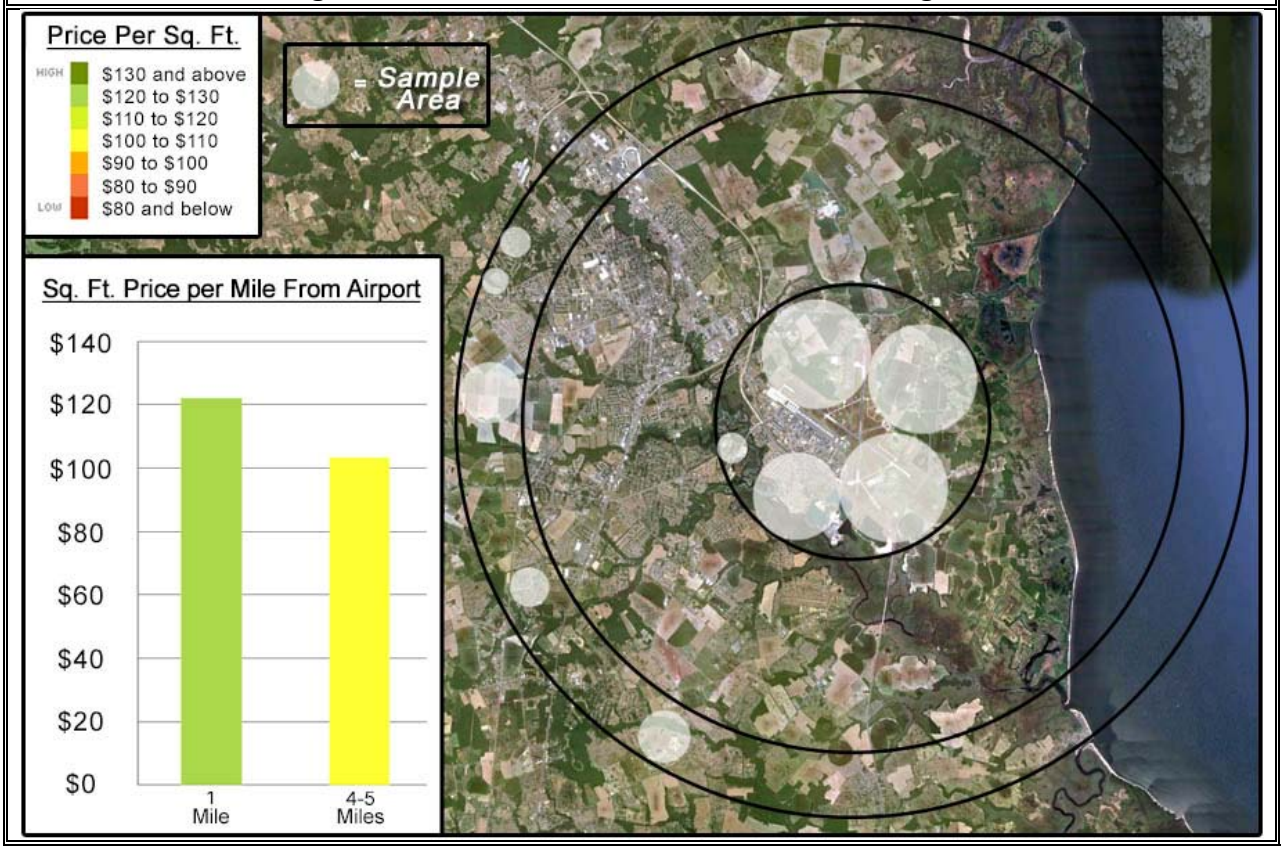


Table 6-22 - Residential Real Estate Surrounding Delaware Airpark			
	1 Mile Properties	**4-5 Mile Properties**	**Price Difference (%)**
Properties by Segment	297	320	
Average Price Per Sq. Ft.	**$109**	**$110**	**-1%**
Average Property Size	1,983 Sq. Ft.	1,954 Sq. Ft.	

Civil Air Terminal at Dover Air Force Base

Data collected surrounding the Civil Air Terminal at Dover Air Force Base was the most surprising of any airport in this study, with residential property values averaging 19 percent higher within one mile of the airport compared to samples taken within a 4-5 mile radius of the airport.

Figure 6-11 - Residential Real Estate Surrounding CAT



As shown in Table 6-23, the average price per square foot within one mile of the Civil Air Terminal was $122. This was $19 more per square foot than similar properties within a 4-5 mile radius of the airport which had an average value of $103 per square foot. With a total of 810 properties examined, CAT had the second largest sample size of any airport in the study.

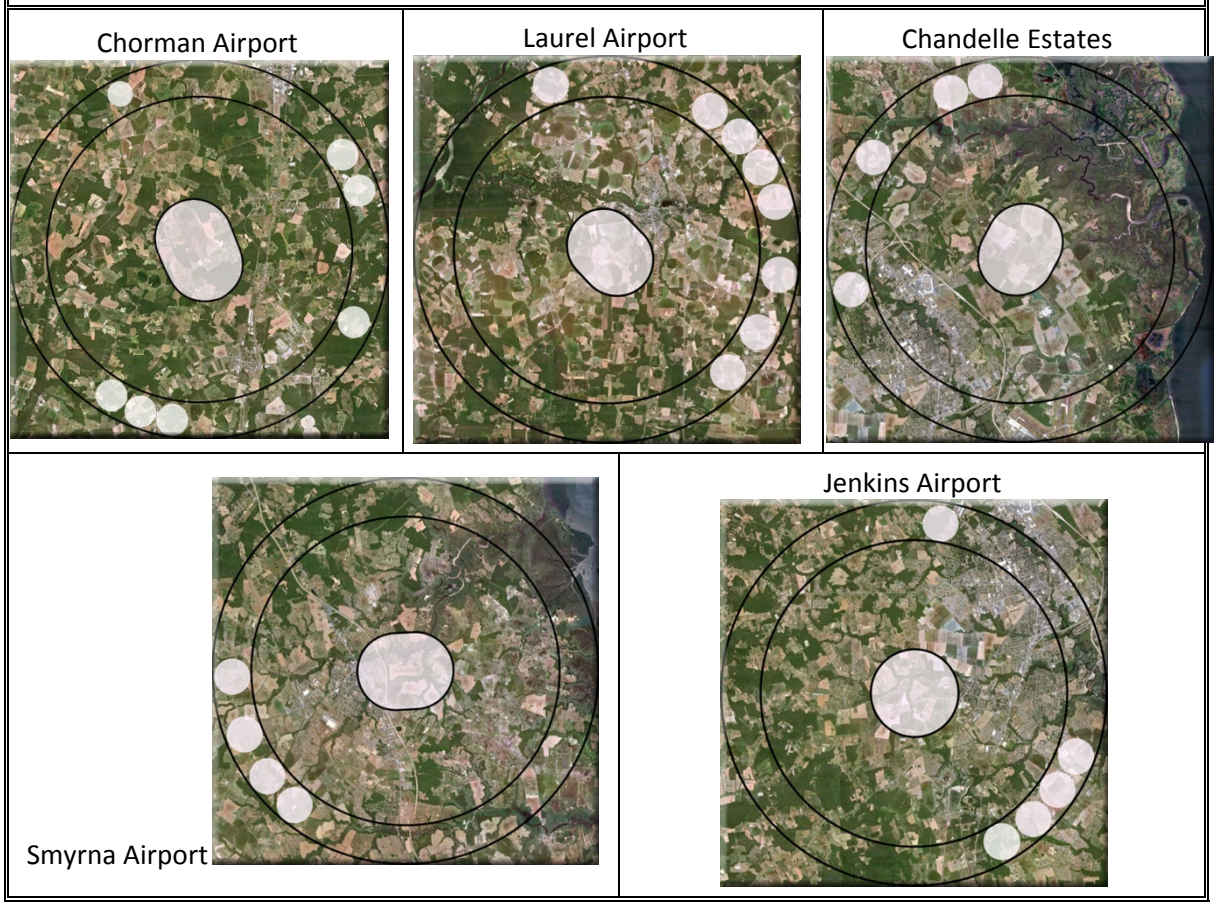
Table 6-23 - Residential Real Estate Surrounding CAT

	1 Mile Properties	4-5 Mile Properties	Price Difference (%)
Properties by Segment	211	599	
Average Price Per Sq. Ft.	**$122**	**$103**	**19%**
Average Property Size	1,999 Sq. Ft.	2,056 Sq. Ft.	

Other Public Use Airports

For this study, other public use airports included in the residential analysis included Chorman, Laurel, Chandelle Estates, Smyrna, and Jenkins Airport. These airports were not included in the commercial real estate portion of this report based upon the absence of commercial real estate near the airports due to location outside major commercial centers. Figure 6-12 displays the sample areas utilized in the data collection for these airports, and Table 6-24 lists the numbered results.

Figure 6-12 - Other Public Use Airport Residential Property Sample Areas



Of the airports examined, Chorman Airport displayed the highest positive effect on residential real estate, with properties within one mile of the airport displaying 10 percent higher value per square foot than similar properties examined 4-5 miles from the airport. The other airport's displayed little to no effect on property values, with Chandelle Estates recording the second highest positive influence at six percent higher value, and Jenkins Airport recording the only negative effect of -1 percent value. These findings are not unexpected, as low operation counts on these airports provide low noise impacts on surrounding properties compared to the NPIAS airports in this study.

Table 6-24 - Residential Real Estate Surrounding Other Public Use Airports

	1 Mile Properties	4-5 Mile Properties	Price Difference (%)
Chorman Airport			
Sample Size	47	63	
Average Price Per Sq. Ft.	**$122**	**$111**	**10%**
Average Property Size	1,913 Sq. Ft.	1,954 Sq. Ft.	
Laurel Airport			

Table 6-24 - Residential Real Estate Surrounding Other Public Use Airports			
	1 Mile Properties	**4-5 Mile Properties**	**Price Difference (%)**
Sample Size	45	155	
Average Price Per Sq. Ft.	**$108**	**$106**	**1%**
Average Property Size	2,061 Sq. Ft.	1,903 Sq. Ft.	
Chandelle Estates			
Sample Size	120	192	
Average Price Per Sq. Ft.	**$103**	**$97**	**6%**
Average Property Size	1,632 Sq. Ft.	1,841 Sq. Ft.	
Smyrna Airport			
Sample Size	244	318	
Average Price Per Sq. Ft.	**$116**	**$115**	**1%**
Average Property Size	1,331 Sq. Ft.	2,101 Sq. Ft.	
Jenkins Airport			
Sample Size	198	450	
Average Price Per Sq. Ft.	**$105**	**$107**	**-1%**
Average Property Size	1,765 Sq. Ft.	1,908 Sq. Ft.	

Summary and Findings for Residential Real Estate

While some airports demonstrated negative effecting residential real estate, it can be concluded that this is not a blanket rule that can be applied to any airport. In fact, only one airport demonstrated negatively affecting adjacent residential property values while seven airports displayed no tangible effect, and two airports demonstrated positively affecting property values. However, to understand the full story, both residential and commercial property values must be examined. For example, New Castle Airport showed a negative impact on residential property values, but a very high positive impact on commercial property values. The alternative ranking process attempts to combine the scores of these various land uses to determine which option is best.

5.4 Alternative Ranking Process

In order to rank alternatives with respect to the environmental and land use compatibility factors described in this analysis, a method was developed that gave higher rankings to the alternative that resulted in the highest overall land values. Because both commercial and residential land values near airports were examined, there were some mixed results at specific airports. For example, New Castle Airport showed average commercial property values that were almost 88 percent higher near the airport than similar properties between four and five miles away. Conversely, residential property values were 18 percent higher away from the airport relative to those nearby.

Key factors in ranking the alternatives involved the number of airports in each alternative and the cumulative effect of aircraft activity on land values. In this regard, Alternative 2 –

Contracted System of Airports, has the fewest airports, but the greatest concentration of aircraft activity at each of those airports. Alternative 1 – Baseline Alternative has the greatest number of airports, but the widest dispersion of aircraft operations. Thus, the ranking of alternatives had to consider these factors, along with the actual impact of each airport on its immediate area land values. Table 6-25 presents a summary of the ranking process.

Table 6-25 – Ranking of Alternatives

Airport	**Alt 1**		**Alt. 2**		**Alt. 3**	
	Commercial	Residential	Commercial	Residential	Commercial	Residential
Chandelle Estates	N/A	0.06	--	--	--	--
Chorman	N/A	0.1	--	--	N/A	0.1
Delaware Airpark	0.06	-0.01	0.06	-0.01	0.06	-0.01
Dover CAT	0	0.19	--	--	0	0.19
Jenkins	N/A	-0.01	--	--	--	--
Laurel	N/A	0.01	--	--	N/A	0.01
New Castle Airport	0.87	-0.18	0.87	-0.18	0.87	-0.18
Smyrna	N/A	0.01	--	--	--	--
Summit	N/A	-0.01	N/A	-0.01	N/A	-0.01
Sussex County	-0.18	-0.01	-0.18	-0.01	-0.18	-0.01
Totals	0.75	0.15	0.75	-0.21	0.75	0.09
Average	**0.90**		**0.54**		**0.84**	

As shown, the percentage difference between airport-impacted and non-airport-impacted property values was included for both types of land use. From this table, it can be shown that the existing system averages slightly better than Alternative 3, primarily because of the good influence of the smaller privately owned airports on property values. Alternative 2 is a distant third. Ranking from highest to lowest with regard to environmental and land use considerations would include the following:

- Alternative 1 – First
- Alternative 3 – Second
- Alternative 2 – Third (distant)

This scoring will be taken into account in selecting the preferred alternative in Chapter 7 of this report.

6. DEVELOPMENT COSTS FOR ALTERNATIVES

THE EVALUATION OF ALTERNATIVES INCLUDES AN EXAMINATION of system wide costs in order to compare the resources needed to fund each concept. Once these differences are estimated, a comparison or ranking of alternatives with respect to cost can be made. All public-use airports (both publicly owned and privately owned) were included in the cost totals, since the costs are representative of the deficiencies as they currently exist and the funding required to correct those deficiencies.

The process used to estimate system costs involved two steps. First, a determination of applicable unit costs was made; then these costs were applied to the development proposed in each alternative system. Comparative cost estimates were prepared using the requirements for each airport in each alternative. A detailed description of unit costs is presented in Table 6-8. All unit cost estimates are in constant 2012 dollars. It should be noted that these costs estimates are averages and that specific costs will differ by airport. However, since each alternative uses that same unit cost estimates, total costs for each alternative will be comparative.

Table 6-8 - Unit Cost Estimates

ITEM	Unit	Price/Unit
Runway Paving – Asphalt (includes site prep)	Square Yard	$40-$117
Runway Paving – Concrete (includes site prep)	Square Yard	$135
Taxiway Paving – Asphalt	Square Yard	$40-$117
Runway & Taxiway Paving Overlay	Square Yard	$30-$35
Apron Paving – Asphalt	Square Yard	$135
Automotive Parking Space	Square Yard	$50
Terminal Building	Square Foot	$230
Conventional Hangar	Square Foot	$150
T-Hangars	Unit	$75,000
High-Intensity Runway Lighting	Linear Foot	$40
Medium-Intensity Runway Lighting	Linear Foot	$40
Low-Intensity Runway Lighting	Linear Foot	$40
Medium-Intensity Taxiway Lighting	Linear Foot	$40
PAPI	Each	$75,000
VASI	Each	$75,000
REILS	Each	$75,000
MALSR	Each	$1,000,000
Localizer	Each	$500,000
Glide Slope	Each	$1,500,000

Table 6-8 - Unit Cost Estimates		
ITEM	**Unit**	**Price/Unit**
Airport Rotating Beacon	Each	$15,000
Segmented Circle & Wind Sock	Each	$40,000
Wind Indicator	Each	$12,000
Weather Station	Each	$125,000

To estimate total costs, these unit costs were applied to the required number of units for each planning period. Table 6-9 presents a summary of costs by airport and alternative. Not included in these costs are the obstruction removal costs that were estimated as a part of Section 3 of this evaluation. Those costs are included in Table 6-10 in the totals comparison.

The comparison of airport development costs in each alternative shows that Alternative 2 is the least expensive and Alternative 3 is most expensive. However, this ranking accounts for spending at both public and privately owned airports. When the costs are broken down in a later chapter, the private sector funding will be separated from the total funding requirements. At that time, it will be shown that Alternative 2 is actually the most expensive option, relative to public funding.

Table 6-10 presents a summary of the total costs for each alternative, broken down by cost component. This table includes the airfield overlay costs and obstruction removal costs for each alternative. As such, this Table presents a full picture of the impacts of various development decisions at Delaware airports. The overall cost for these alternatives includes the following, by rank:

- Alternative 2 $89,389,600
- Alternative 1 $90,085,900
- Alternative 3 $96,556,400

From a cost perspective, the alternative rankings show that the addition of the obstruction costs to the other development costs brought Alternatives 1 and 3 closer together in total costs.

Table 6-9 - Development Costs by Alterinative

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	$856,500	$425,800	$1,282,300	-	-	-	-	-	-
Chorman Airport	$649,500	$776,700	$1,426,200	-	-	-	$649,500	$3,729,000	$4,378,500
Delaware Airpark	$6,562,500	$19,782,000	$26,344,500	$10,509,000	$25,643,800	$36,152,800	$4,987,500	$19,782,000	$24,769,500
DelDOT Helistop	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dover AFB CAT	$9,694,000	$0	$9,694,000	-	-	-	$13,459,500	$0	$13,459,500
Jenkins Airport	$115,000	$150,000	$265,000	-	-	-	-	-	-
Laurel Airport	$0	$75,000	$75,000	-	-	-	$0	$75,000	$75,000
New Castle Airport	$1,336,500	$23,360,900	$24,697,400	$1,336,500	$23,360,900	$24,697,400	$1,336,500	23,360,900	$24,697,400
Smyrna Airport	$300,000	$0	$300,000	-	-	-	-	-	-
Summit Airport	$1,025,000	$1,625,200	$2,650,200	$1,025,000	$1,625,200	$2,650,200	$1,025,000	$2,798,300	$3,823,300
Sussex County Airport	$750,000	$11,388,800	$12,138,800	$2,625,000	$16,898,200	$19,673,200	$750,000	$16,898,200	$17,648,200
Total	$21,289,000	$57,272,400	**$78,873,400**	$15,495,500	$67,528,100	**$83,023,600**	$22,208,000	$66,643,400	**$88,851,400**

Table 6-10 - Total Costs By Alternative

Development Item	Alternative 1	Alternative 2	Alternative 3
Landside	$21,289,500	$15,495,500	$22,208,000
Airside	$57,272,400	$67,528,100	$66,643,400
Obstructions	$11,524,000	$6,366,000	$7,705,000
Total Costs	**$90,085,900**	**$89,389,600**	**$96,556,400**

7. IMPACT OF CONTINGENCIES

ALTERNATIVE 3 PRESENTS A NUMBER OF CONTINGENCIES that will have significant impacts on the Delaware Aviation System if they come to pass. Two of the contingencies mentioned will likely happen in each/all of the Alternatives. These involve the runway expansion at Sussex County and the loss of NPIAS funding at Summit. Other contingencies that are not likely to have a significant impact on the system involve the loss of some public-use airports to private use only. These airports are likely to be in Kent County and would include Chandelle Estates, Jenkins, and Smyrna. The other privately-owned, public-use airports are considered active enough and financially strong enough to continue as public-use facilities. Two of those airports are anticipated to develop runway improvements at some point within the planning horizon – Chorman Airport and Summit Airport.

Perhaps the greatest impact on the system is the possible Base Realignment And Closure (BRAC) process for Dover AFB. If the heavy lift mission of the Base is transferred to McGuire AFB in New Jersey, it will mean a significant loss of personnel, aircraft activity, and local economic impact. This loss would mean that only the mortuary and perhaps the hospital would remain active on the Base. Such a loss might mean a reduction of as much as 7,000 direct jobs, leaving about 800 base personnel and contractor jobs. Such a move would reduce the economic impact on the community from $528.2 million to roughly $60 million. In addition, the loss of indirect jobs (jobs created in Dover, Kent County, and Delaware because of the spending of Base employees) totaling almost 3,500.

In addition to the negative impact, there are several potential positive impacts associated with the BRAC of Dover AFB. The first would be the availability of the Base for full joint use by civilian aircraft. This possibility provides a number of cost offsets for future plans at Delaware Airpark, as well as the accommodation of airline service, air cargo service, and private aircraft storage at the Base. For this analysis, the following benefits of full joint use/civilian ownership of the Base were examined:

- Decreased need for expansion of Delaware Airpark (remains at 4,200 feet)
- Possible use of Base passenger terminal for potential airline service
- Use of the Base for civilian air cargo
  - Decreased need to restructure roadway access system to reach CAT with heavy trucks (can use main roads through Base)
- Use of the Base for Maintenance/Repair/Overhaul (MRO) of large aircraft
  - Decreased need to develop large hangar on CAT property for aircraft maintenance
- Redevelopment of some Base facilities
- Potential relocation of small GA aircraft from private-use airports to the Base

Each of these potential benefits is discussed below.

7.1 Decreased Need to Expand Delaware Airpark

If Dover AFB is opened to full, unrestricted joint use by general aviation aircraft, there is an impact on the need to further expand Delaware Airpark in the future. Assumptions in this scenario include the following:

- Any BRAC process or other means of taking Dover AFB to full, unrestricted joint use would not occur until 2015.
- Current expansion plans to take Delaware Airpark to 4,200 feet of runway length will remain intact and be implemented prior to 2015.
- Costs to be incurred for the expansion of Delaware Airpark that include the new 4,200-foot runway and associated property acquisition will not likely be avoided due to the timing of potential actions at Dover AFB. Because it is not likely that the joint-use status of Dover AFB will change before 2015, current plans in place for Delaware Airpark will, in all probability, move forward. Planned expenditures for the improvement at Delaware Airpark include approximately $17 million for the following:
  - Site Preparation
  - New Runway and Taxiway Development
  - New Access Road
  - Other Items: Obstruction Removal, Mitigation Construction, Perimeter Road

- While these costs can be considered "sunk" costs for purposes of this analysis, the potential full joint use of Dover AFB would eliminate the need to further expand Delaware Airpark. For example, in Alternative 2, the assumption of lack of joint use of Dover AFB would result in the need to provide business aviation access to Kent County, DE. Such access would involve the expansion of Delaware Airpark's future 4,200-foot runway to 5,500 feet. Additional land acquisition, runway extension construction costs, and other costs are estimated to total $7.5 million. This capital investment could be saved or even reinvested into general aviation facilities at Dover AFB if that facility were to gain full, unrestricted joint use.

7.2 Possible Airline Service

Dover AFB serves as an embarkation point for military service men and women traveling to and from theaters of U.S. operations. The current terminal building (436th Aerial Port Squadron Passenger Terminal) is capable of processing more than 100,000 passengers per year. Should the Base mission change through a BRAC process, the terminal building should be available for local airline service.

For several years, potential airline service has been courted in Dover. The most recent interest has been shown from Allegiant Airlines, which selected Dover as one of eight future expansion

points in its route structure. By using the military terminal rather than developing a new terminal building at the Civil Air Terminal, additional capital investment dollars could be saved. As an initial temporary provision, the existing terminal building at the CAT was to be expanded via manufactured modules. Rental rates for these modular units were expected to cost $30,000 annually. Assuming successful airline service, a replacement terminal building would be constructed at some point in the future. Costs for such a building could run $2 million or more. Thus, long-term savings by using the 436th APS Passenger Terminal for civilian airline service could exceed $2 million.

Figure 6-23 - 436th APS Passenger Terminal at Dover AFB

7.3 Civilian Air Cargo

A third potential use for the full and unrestricted joint use of Dover AFB would be the development of a civilian air cargo hub. Discussions with current civilian cargo airlines that provide supplemental cargo air lift for the military indicated that some would be interested in using the CAT. Currently, more than 10 percent of all domestic air freight travels through JFK International. For companies such as Evergreen Airlines International, much of their civilian freight travels through New York or Miami. An air cargo hub or freight forwarding location in the mid-Atlantic region would aid in faster distribution to the geographic center of the East Coast via trucking versus trucking from JFK or Miami International.

If the existing Dover AFB air cargo infrastructure was available for civilian use, no new facilities would be needed at the CAT to support freight forwarding activities. This could save millions of dollars in the development of ramp space and freight transloading facilities. In addition, the main roadways into and out of the Base could be used for truck traffic rather than Horsepond Road. Together, savings on the upgrading of Horsepond Road access and development of a civilian air cargo facility could total over $25 million, depending upon when a potential BRAC was announced. That is, if the BRAC is announced before development of reinforced ramp space at the CAT, a total of up to $17 million could be saved on pavement reconstruction costs. If the announcement comes after the potential improvement of the CAT, that capital investment would be considered sunk costs.

If there was not a BRAC of the Base mission, then the civilian air cargo operation could still occur, but it would be limited to the expanded CAT property. Under these circumstances, the

improvement in roadway access (Horsepond Road), the strengthening of the CAT ramp, and the development of an air cargo facility on non-Base property would be necessary. Thus, without a BRAC there would be no civilian savings for the potential air cargo activity.

7.4 MRO Facilities

A fourth potential benefit resulting from a BRAC of the Dover AFB heavy lift mission would be the potential development of Maintenance/Repair/Overhaul facilities for large aircraft. One or more of the large military hangars would be ideal for maintenance and refurbishment activities. In fact, PATS in Georgetown, DE once considered the development of MRO facilities at the CAT. While there were numerous reasons why that never occurred, the fact that a significant operator considered the location gives rise to a belief that other operators may desire such a location – particularly if facilities were already in place. Of significance is the fact that the Base has 12,900 feet of runway – enough for the largest aircraft in the world's fleet. All apron areas are capable of the load bearing requirements for B-747 and larger aircraft. Thus, operationally and logistically the Base can accommodate very large aircraft for MRO activities. While there are no current plans to develop civilian MRO facilities at the CAT, the air cargo airlines have indicated that they would like a large hangar to perform maintenance work on their aircraft while at the CAT. Such a facility was previously estimated to cost about $8 million. If available for use at the Base, this facility would provide an opportunity for the air cargo airlines or any private MRO operator to perform heavy maintenance.

7.5 Redevelopment of Base Facilities

In every BRAC, there are redevelopment activities where the local community strives to integrate the former military facilities into civilian use. Sometimes this results in the expansion of the inventory of community housing facilities, new industrial locations, additional warehousing space, and aviation-related development. For Dover AFB, all of these options are available if there is a significant BRAC. With any BRAC, there is funding available for redevelopment from the military, which would include the establishment of a temporary redevelopment organization. This entity would work with local economic development organizations to infill Base infrastructure with tenants.

In Kent County, the Kent Economic Partnership is a not-for-profit economic development organization that oversees the Kent County Aero Park. In addition, the Partnership is involved in economic development activities within the County such as recruitment of industrial and commercial companies to the area. This organization, along with the Delaware Economic Development Office (DEDO), DelDOT, DRBA, the City of Dover, and other key stakeholders would be involved in any redevelopment efforts.

7.6 Attraction of GA Based Aircraft

Under full and unrestricted joint use, general aviation based aircraft would be permitted at the Base. This condition would not require a BRAC, but would require a revised joint-use agreement. Based aircraft could locate at the CAT, or in the case of a BRAC, they could locate on the Base. It is a little known fact that general aviation aircraft are currently based at Dover AFB. These belong to a flying club of military pilots. At one point there were more than 20 of these aircraft located on the Base. Currently, there are only about 10 such based aircraft. Without the military mission and its pilots, it is likely that these aircraft would not remain at the Base after a BRAC.

The aviation system planning analysis estimated that the Base would attract 21 general aviation based aircraft from surrounding airports. This estimate was coupled with the assumptions that Chandelle Estates would revert to private use and that five previously forecast business jets at Delaware Airpark would actually locate at Dover AFB if it were available for unrestricted joint use. It should be remembered that Delaware Airpark will not expand to accommodate larger business jet aircraft if Dover AFB is available for full joint use.

7.7 Summary

In summary, it can be concluded that there are significant economic implications to either full joint use of Dover AFB or a BRAC of the facility. These implications are slightly different for each option. Under unrestricted joint use, it is assumed that the Air Force continues to operate the Base and that civilian aircraft cannot be housed on AFB property. In this regard, it is assumed that all general aviation based aircraft, airline operations, air cargo operations, etc., must occur on the CAT if there is no BRAC. If a BRAC creates the unrestricted joint use condition, then many of the former military facilities would be available for redevelopment and reuse.

The economic differences associated with unrestricted joint use of Dover AFB are summarized as follows:

Joint Use – No BRAC	**Savings**
▶ No Expansion of Delaware Airpark Beyond 4,200 Feet:	$7,500,000
▶ Airline Terminal at CAT:	($2,140,000)
▶ Civilian Air Cargo at CAT:	($25,000,000)
▶ MRO Facilities at CAT:	($8,000,000)
▶ Redevelopment of Base Facilities:	N/A
▶ Attraction of GA Based Aircraft:	N/A
▶ TOTAL	($27,640,000)

Joint Use – BRAC	**Savings**
▶ No Expansion of Delaware Airpark Beyond 4,200 Feet:	$7,500,000
▶ Airline Terminal at CAT:	$2,140,000
▶ Civilian Air Cargo at CAT:	$25,000,000
▶ MRO Facilities at CAT:	$8,000,000
▶ Redevelopment of Base Facilities:	N/A
▶ Attraction of GA Based Aircraft:	N/A
▶ TOTAL	$42,640,000

The above comparison indicates that if there is full joint use of Dover AFB without a BRAC, then only minor savings can occur – this involves an estimated $7.5 million in future expansion costs for Delaware Airpark. "Non-savings" of $35.14 million would be incurred through the development of the CAT to meet potential airline, air cargo, and MRO functions.

On the other hand, if a BRAC occurs at Dover AFB which provides civilian use of Base facilities a total of $42.64 million in savings could occur by using these facilities rather than constructing them either at Delaware Airpark or the CAT. It should be noted, that only $9.64 million in savings would be available to the public sector, since the civilian air cargo and MRO facilities ($33 million in costs) would be developed using private funding. Thus, from a public funding standpoint, there is only $2.14 million in potential savings between the full joint use without a BRAC and full joint use with a BRAC.

Not included in this analysis is the potential revenue and economic activity that may occur through the redevelopment of Base facilities. In many communities where a military base has undergone a BRAC, this redevelopment activity and associated economic returns are significant. Also not included in the comparison was the potential loss of economic impact from the Base that can amount to hundreds of millions of dollars. Thus, the above comparison is simply a simple analysis of how to make the best of a bad situation. Under all scenarios, the BRAC of the Base would result in negative economic consequences for an extended period of time.

Chapter 7:
Recommended Aviation System Plan

Recommended Aviation System Plan

THE RECOMMENDED AVIATION SYSTEM WAS FORMALIZED BY describing each airport's location, physical facilities, role, timing of development, and cost. This chapter is organized to include the following sections:

- Selection of Preferred Alternative
- Description of Recommended Aviation System
- Summary

The process of selecting the recommended system along with the system's attributes are described below.

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 Objectives

From the Phase 1 portion of the analysis, the overall goal of the Delaware Department of Transportation, Office of Aeronautics with regard to aviation can be stated as follows:

- *To enhance Delaware's economic development by fostering and promoting a safe and efficient aviation system for the movement of goods, services, and people and to encourage and promote aviation and aviation safety. Objectives that support this goal include, but are not limited to the following:*
  - *To facilitate the timely development of airports that will meet the air transportation needs and economic goals of the State.*
  - *To ensure that a system of airports is developed that provides a high degree of safety to the users, while at the same time provides adequate levels of service and facilities throughout the State.*
  - *To maximize the economic benefits and sustainability of the aviation system.*
  - *To minimize the airport system's environmental impact.*
  - *Participate in the process of determining the appropriate role for each Delaware airport and in the provision of a portion of the financial assistance for this development.*

- *Make available to the flying public current and accurate information regarding Delaware's aviation system.*

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 completed 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	Completed?	Decision Factor
Aviation System		
1. To collect all relevant data necessary to develop a system of airports and facilities that maximizes their use.	Yes	No
2. To forecast aviation demand for the State's airports through the year 2030, adequately assessing airline, general aviation, cargo, military aviation operations, and surface access needs.	Yes	Yes
3. To monitor airport operations at non-towered airports.	Yes	No
4. To quantify existing capacity of airport airside and landside facilities for use in Phase II alternative development scenarios.	Yes	Yes
5. To evaluate the role of privately owned or non-NPIAS airports and make recommendations regarding possible preservation or development of these facilities for the long term to satisfy operational demands and service area voids.	Yes	Yes
6. To evaluate the application of multi-modal linkages to system airports.	Yes	Yes
7. To develop a plan with enough flexibility to be implemented even when certain recommendations cannot be executed.	Yes	Yes
8. To adequately assess and plan for airport security for the State's aviation system.	Yes	No
Economic Sustainability and Development		
1. Consider the economic and financial viability of the State's aviation system and plan for potential future shortfalls in capital funding sources.	No*	No
2. Assist in the funding of revenue-producing infrastructure and other infrastructure related to retention of existing clients and economic development.	No*	No
3. Seek a developmental balance of publicly and privately-owned airports in the State, while maintaining the public's access to safe, adequate facilities.	Yes	Yes
4. Disseminate information to airports on green technology improvement recommendations.	No*	Yes
5. Maximize Federal financial participation in the development of the aviation system.	No*	Yes
6. Encourage financial self-sufficiency for airports within the aviation system by enacting policies favorable to aviation businesses and aircraft ownership.	No*	No
7. Incorporate Airport Community Value metrics into the priority ranking of recommendations resulting from the SASPU.	No*	No
8. Assist airport sponsors in developing strategic airport business plans as a part of the statewide aviation system planning efforts.	No**	No

Table 7-1 – Role of System Plan Objectives in Selection Process		
System Plan Goals/Individual Objectives	**Completed?**	**Decision Factor**
Environmental		
1. Minimize potential environmental impacts identified in FAA Order 5050.4B with special attention to minimizing residential dislocation, mitigating noise impacts, minimizing air and water pollution, protecting wildlife, and preserving cultural resources.	Yes/Partial	Yes
2. Develop future recommendations that are compatible with existing land use plans and desired land uses and that reduce objectionable effects of aviation facilities on non-compatible areas, to the extent possible.	Yes	Yes
3. Plan for an energy-efficient system of airports that provides ease of air and ground access.	No*	Yes
4. Promulgate information concerning environmentally "green" methods of undertaking infrastructure development projects.	No*	No
Social		
1. Plan for the orderly and timely development of the aviation system, maximizing services provided to the system users while minimizing community disruption.	Yes	Yes
2. Integrate airport and airport-related developments with other local community, county, and State development plans and policies along with those proposed by individual airport sponsors and other agencies such as the Wilmington Area Planning Council (WILMAPCO) and the Delaware Valley Regional Planning Commission (DVRPC).	Yes	Yes
3. Ensure the safety of each airport as well as the safety of the entire integrated aviation system.	No**	No
4. Work toward the development of an aviation system that benefits the maximum number of air travelers and job holders, while conserving economic and natural resources to the greatest extent practical.	Yes	Yes

* To be completed in Financial & Implementation Plan
** Not included in work scope

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 objective to forecast aviation demand through the year 2030. The forecast was used in allocating demand to each alternative and was important in assessing future impacts. However, that was an indirect input to the decision process.

From Chapter 6, there were six evaluation criteria, including:

- Ability to Serve Forecast Demand
- Impact of Airspace Obstructions
- Impact on Surface Transportation System
- Environmental & Land Use Compatibility

- Development Costs
- Impact of Contingencies

In this section, a summary of the scoring is presented in matrix format. It should be noted that for some of the Contingencies, the matrix format could not display the entire decision process. For those items, the evaluation process and its resulting conclusions are described. Table 7-2 presents a summary of the scoring process.

Table 7-2 – Alternative Scoring Process

Criteria	Alternative 1	Alternative 2	Alternative 3	Preferred Alternative
Serve Forecast Demand				
Airside Facilities	1	3	2	Alt. 1
Landside Facilities	2	3	1	Alt. 3
Airspace Obstructions				
Removal Needs	3	1	2	Alt. 2
Surface Transportation				
Infrastructure Improvements	2	3	1	Alt. 3
Environmental & Land Use				
Least Impact to Land Values	1	3	2	Alt. 1
Development Costs				
Least Cost	2	1	3	Alt. 2
Impact of Contingencies				
High/Medium/Low	3	2	1	Alt. 3
Sum of Scores	**14**	**16**	**12**	**Alt. 3**
Average Score	**2.00**	**2.29**	**1.71**	**Alt. 3**

As shown, rankings were made on the basis of first, second, and third. The higher the ranking is the lower the score is. Thus, Alternative 3 scored the lowest on average (1.71), which meant that it had the highest overall ranking. Alternative 1 scored second, with Alternative 2 ranked third. A description of the rationale behind the scoring process is presented below.

Ability to Serve Forecast Demand

In ranking the alternatives with respect to their ability to serve demand, two items were considered (airside and landside facilities), along with a notion of geographic coverage for users. For the airside facilities, Alternative 1 was ranked first, since it provided the most number of runways available to the flying public. At the same time, it required the least amount of new runway paving. Alternative 3 was ranked second since it had the second-most number of runways. Although it showed the greatest amount of new runway paving, one of the included projects involved a new runway for Chorman Airport.

Landside facility rankings were based on the alternative with the least required facilities. That alternative had, by default, the greatest amount of facilities on hand to serve future forecast demand. In this regard, Alternative 3 ranked first, followed by Alternative 2 and then Alternative 1. One significant factor in this ranking is the assumption that Alternative 3 will have some type of full civilian joint use at Dover AFB.

A judgmental consideration in the ability of an alternative to serve demand was the geographic coverage offered by each option. This was in keeping with the economic objective: "Seek a developmental balance of publicly and privately-owned airports in the State, while maintaining the public's access to safe, adequate facilities." In this regard, Alternative 1 has the greatest geographic coverage in Delaware regarding public-use airport locations. However, Alternative 3 assumes the same number of airports, but several of them are assumed to no longer be public-use facilities (Chandelle Estates, Smyrna, and Jenkins). Alternative 2 has the least number of facilities and service area coverage.

Impact of Airspace Obstructions

The requirement to remove airspace obstructions is governed to some extent by the number and type of airport facilities included in the recommended plan. Airspace obstruction removal was included in the evaluation of alternatives to comply with the social objective: "Ensure the safety of each airport as well as the safety of the entire integrated aviation system." For alternatives with more airports, there are more costs for obstruction removal – particularly if many of those airports are privately owned and have no jurisdiction for removing obstructions on adjacent property that they do not own. This ranking process is borne out by the costs associated with obstruction removal for each alternative. As expected, Alternative 1 had the highest cost, followed by Alternative 3. Alternative 2 had the lowest cost because it had the fewest airport obstructions and runways. Because the State has enabling legislation for obstruction removal, the plan with the lowest required cost ranked highest. It should be noted that in no instance is safety compromised in this ranking process. That is, all airports within each alternative are assumed to have their required airspace obstructions removed.

Impact on Surface Transportation System

Many surface transportation infrastructure improvements will have to be made regardless of the alternative aviation system involved. However, of all the options, Alternative 3 has the greatest surface access improvement needs. Evaluation criteria were guided by a combination of objectives which were described earlier. The first was an environmental objective: "Plan for an energy-efficient system of airports that provides ease of air and ground access." At the same time, the Aviation System objective: "To evaluate the application of multi-modal linkages to system airports" had to be considered in the development of surface access infrastructure for any air cargo hub that may be developed at the Civil Air Terminal. Finally, in the

preservation and creation of jobs, an Economic objective had to be considered: "Assist in the funding of revenue-producing infrastructure and other infrastructure related to retention of existing clients and economic development." The additional highway infrastructure improvements at Sussex County Airport will help retain the jobs at PATS for the County. Thus, this improvement along with the improvements to Horsepond Road under Alternative 3 will serve to either retain or create jobs.

Because of the high secondary impacts (jobs) of creating additional highway infrastructure over and above the other Alternatives, the scoring system used for this criterion favors the additional development. This method is consistent with the study objectives, which weigh the development of infrastructure against the retention or creation of new jobs. Simply stated, new jobs are worth the development of roadway improvements.

Given these parameters, Alternative 3 was ranked highest, followed by Alternative 1. With the least number of facilities and job creation capabilities, Alternative 2 ranked third.

Environmental and Land Use Compatibility

The ranking process used for the Environmental and Land Use Compatibility evaluation criteria focused on the value of property near airports in Delaware. These property values were used as surrogates to measure the impact of airport noise on surrounding land uses. Noise impact, in particular is blamed by many to cause a devaluation of real estate. If the conventional wisdom holds, the property in the near-airport areas should average significantly less in value from similar land uses that are not impacted by airports.

The analysis for Delaware airports yielded mixed results. That is, the conventional wisdom that airport operations impact land values immediately adjacent to airports was not borne out uniformly among all airports. For example, New Castle Airport showed average commercial property values that were almost 88 percent higher near the airport than similar properties between four and five miles away. Conversely, residential property values were 18 percent higher away from the airport relative to those nearby.

Key factors in ranking the alternatives involved the number of airports in each alternative and the cumulative effect of aircraft activity on land values. In this regard, Alternative 2 – Contracted System of Airports, had the fewest airports, but the greatest concentration of aircraft activity at each of those airports. Alternative 1 – Baseline Alternative had the greatest number of airports, but the widest dispersion of aircraft operations. Thus, the ranking of alternatives had to consider these factors, along with the actual impact of each airport on its immediate area land values.

Development Costs

The comparison of airport development costs in each alternative shows that Alternative 2 is the least expensive and Alternative 3 is most expensive. The reason that Alternative 1 costs are less than the other alternatives can be attributed to the fact that fewer airports are included and thus, the costs of obstruction removal are lower. In addition, the assumption that Sussex County Airport would only expand its primary runway to 5,500 feet versus 6,000 feet (as shown in Alternatives 2 and 3) and that Delaware Airpark would only expand its runway to 4,200 feet versus 5,500 feet (as shown in Alternative 2) impact the costs. The overall cost for these alternatives includes the following, by rank:

- Alternative 2 $89,389,600
- Alternative 1 $90,085,900
- Alternative 3 $96,556,400

From a cost perspective, the alternative rankings show that the addition of the obstruction costs to the other development costs brought Alternatives 1 and 3 closer together in total costs. Because of the numeric nature of the evaluation, the ranking is very straightforward with Alternative 2 ranked first, Alternative 1 ranked second, and Alternative 3 ranked third.

Impact of Contingencies

An analysis of the potential impacts of various contingencies was undertaken as a part of the Evaluation of Alternatives. Contingency actions identified in the analysis included the following major possible occurrences:

- Expansion of Sussex County Airport Primary Runway
- Loss of Three Privately Owned, Public-Use Airports to Private Use Only
- Runway Expansion/Improvements at Two Privately Owned Airports
- Potential Full Joint Use of Dover AFB Either Through Negotiation or BRAC

For purposes of this analysis, all of the Alternatives are likely to experience the first two contingency bullet points in some form. That is, the Sussex County Airport primary runway will be expanded, either to 5,500 feet or to 6,000 feet within the planning period. It is also likely that the public-use aspect of some privately owned airports in Kent County will be lost during the period, even if those airports remain open. The difference between Alternatives 1 and Alternatives 3 and 2, however, is the expansion of Sussex County to the full 6,000 foot runway length rather than 5,500 feet. This expansion will preserve a number of jobs at the Airport and therefore is ranked higher in Alternatives 3 and 2 than in Alternative 1 with respect to this criterion.

For the Alternatives Analysis, runway improvements at Chorman (3,600-foot replacement runway) and Summit (832-foot runway extension) were reserved for Alternative 3. These are contingencies that may or may not occur. In addition, any improvements at Summit would be privately funded, which will not constrain the public funding of other eligible Delaware airports. The replacement runway at Chorman would likely require some State funding assistance.

However, the most significant contingency of the three involves the future of Dover AFB and the associated development at the Civil Air Terminal. This contingency involves the full civilian joint use of Dover AFB, either through agreement or through the BRAC realignment of one or more military functions at facility. It is already likely that the Civil Air Terminal will be developed so that supplemental air cargo carriers can use it for overnight parking and light maintenance, at a minimum. So the main impact of this contingency would be the ability to have unrestricted civilian use of the airfield at the Base. If the facility is realigned via a BRAC process, it is possible that following benefits of full joint use/civilian ownership of the Base could occur:

- Decreased need for expansion of Delaware Airpark (remains at 4,200 feet)
- Possible use of Base passenger terminal for potential airline service
- Use of the Base for civilian air cargo
  - Decreased need to restructure roadway access system to reach CAT with heavy trucks (can use main roads through Base)
- Use of the Base for Maintenance/Repair/Overhaul (MRO) of large aircraft
  - Decreased need to develop large hangar on CAT property for aircraft maintenance
- Redevelopment of some Base facilities
- Potential relocation of small GA aircraft from private-use airports to the Base

Of significance, the immediate savings to the future Delaware aviation system of having Dover AFB available for civilian use via the BRAC process was more than $42 million, not including the potential redevelopment of Base facilities to other civilian uses. However, because such an occurrence is considered extremely remote, it was not used in the evaluation scoring. Rather, a more realistic option – full civilian joint use simultaneous with ongoing military operations – was used as the most likely future occurrence for Dover AFB. For purposes of this analysis, full joint use without BRAC was assumed and ranked accordingly.

Impacts of the various contingencies described in Alternative 3 are considerable and will likely have a significant impact on the system. Each alternative was ranked in a simple scoring system equating to high, medium, and low positive impact. The alternative with the highest positive impact was ranked first, followed by the lower positive impacts. As such, the rankings showed Alternative 3 first, Alternative 2 second, and Alternative 1 third with respect to the impact of contingencies.

2. DESCRIPTION OF RECOMMENDED AVIATION SYSTEM

THE RECOMMENDED AVIATION SYSTEM WAS SELECTED in the previous section from the preferred alternative scoring. From that analysis, Alternative 3 emerged as the preferred alternative. As the recommended plan, it can be described in terms of the following:

- Recommended Aviation System
- Airport Roles
- Airport Facilities
- Capital Cost Estimates

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

2.1 Recommended Aviation System

To say that Alternative 3 is the Recommended Aviation System leaves a number of specific questions unanswered. In particular, which set of contingencies are most likely to occur and which are proverbial "long shots?" In this section, an outline of the most likely or reasonable future aviation system is projected. Much of the projections are based upon current developments throughout the State and an historical knowledge of aviation in Delaware.

Recommendations for the shape and character of the future aviation system can be briefly identified as follows:

- Seven public-use airports (including Dover AFB) and three private-use airports (see Figure 7-1) are included in the Recommended Aviation System. This is the same number of facilities and classifications as Alternative 3.
  - The three private-use airports include Chandelle Estates, Jenkins, and Smyrna.
- 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 is assumed to remain at 4,200 feet of runway length (not expanded further because of the full joint use of Dover AFB).
  - It is possible and likely that the Civil Air Terminal will have some type of scheduled airline service.
- Sussex County Airport is assumed to develop 6,000 feet of useable runway length.
- Summit Airport will extend their primary runway to 5,320' but is expected to lose NPIAS funding eligibility prior to developing the extension.
- Chorman Airport will likely construct a replacement 3,600' X 60' runway with full parallel taxiway.

- While it is possible that New Castle Airport gain some type of airline service, it may not be likely during the planning period.

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

An airport system is a group of interdependent airports, which work together toward the shared purpose of providing aviation services to operators and access to users of the system. Often, this system is not defined until a state or regional planning effort analyzes the inter-workings of airports and identifies the system functionality. Throughout the State of Delaware each airport plays a role which contributes toward that central purpose. The Recommended Aviation System, therefore, 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. For example, airports with only turf runways cater to a particular clientele that includes training and recreational flyers. Similarly, full service paved runway airports can service corporate and business interests that require all-weather airport operations and use.

Airport Reference Codes (ARC) are used by the FAA to classify airports to denote both the Aircraft Approach Category and the Airplane Design Group capable of using the airport. This classification system fits well in describing the role of the airport as it relates to the rest of the aviation system. In the Phase I study, definitions of the ARC categories were given. Each category has two components: the aircraft approach category, and the airplane design group. The first component is depicted by a letter (A, B, C, D, or E) and is related to the aircraft approach speed. The second component is depicted by a Roman numeral and is related to the airplane wingspan. The categories of each component are described as follows:

- Aircraft Approach Category is based upon 1.3 times an aircraft's stall speed in their landing configuration at their maximum certificated landing weight:
  - A: Speed less than 91 knots.
  - B: Speed 91 knots or more but less than 121 knots.
  - C: Speed 121 knots or more but less than 141 knots.
  - D: Speed 141 knots or more but less than 166 knots.
  - E: Speed 166 knots or more

- Airplane Design Group is based upon wingspan:
  - I: Up to but not including 49 feet.
  - II: 49 feet up to but not including 79 feet.
  - III: 79 feet up to but not including 118 feet.

- IV: 118 feet up to but not including 171 feet.
- V: 171 feet up to but not including 214 feet.
- VI: 214 feet up to but not including 262 feet.

Listed below are the roles for Delaware airports included in the Recommended Aviation System.

A-I and Less-than-A-I Category Airports

For airports in Delaware, an A-I ARC implies an airport with a paved runway that is at least 2,400 feet in length by 60 feet in width. Airports with shorter recommended runway lengths or widths or turf airports are classified as Less-than-A-I category airports. There is only one airport with these characteristics included in the Recommended Plan: Laurel Airport. While Chandelle Estates, Jenkins Airport, and Smyrna Airport meet this classification, their collective transition to private use status removes them from the public system.

The role of Laurel Airport includes recreational flying, aerial application/spray business flying, parachute training, and pilot training. Laurel serves this demand and also fills a geographic "hole" in the State's aviation service area in eastern Sussex County.

From an aviation demand standpoint, Laurel is anticipated to accommodate 18 based aircraft and 11,600 operations by the year 2030. While this is not a large number, the airport does fill important aviation and economic roles such as parachute training and crop spraying. It should be noted that the three private-use airports in this category are anticipated to accommodate a combined total of 35 based aircraft and 4,500 aircraft operations.

There is one heliport in the Recommended Aviation System – the DelDOT helistop. This facility is rarely used and serves as a convenience to the Department of Transportation. As a public-use facility, pilots desiring to use it typically check with DelDOT first. No improvements to this facility are planned over the period.

B-I and B-II Category Airports

B-I and B-II category airports included in the Recommended Aviation System have minimum runway dimensions of 3,000 feet by 60 feet. Delaware airports in this group are:

- Chorman Airport
- Delaware Airpark
- Summit Airport

The role of B-I and B-II airports is to accommodate a greater mix of business and transient aircraft than A-I or smaller facilities, in addition to recreational and flight training operations.

The Recommended System Plan includes recommended airfield improvements, such as primary runway lengthening and/or widening projects, to provide for added safety. For Chorman, it is anticipated that a new 3,600-foot runway will be developed. Delaware Airpark will receive a new 4,200-foot runway, while Summit is likely to develop an 832-foot runway extension to their existing 4,488-foot primary runway. The Recommended System Plan also estimates a combined need for 53 T-hangar storage units, and roughly 11,000 square feet of conventional hangar storage space at these three airports. All of these recommended airside and landside improvements are responsive to forecast levels of demand, including the need to accommodate over 39 percent of total annual operations in the State.

B-III and Larger Category Airports

B-III and larger category airports included in the Recommended Aviation System feature the following three facilities:

- Civil Air Terminal/Dover AFB
- New Castle Airport
- Sussex County Airport

The role of this group of airports is to provide full-service, all-weather air transportation facilities for all types of aircraft from small, single engine aircraft to large corporate and business jet aircraft. These facilities also offer opportunities for aviation-related businesses to be located on and/or adjacent to the airport. Such facilities are an integral part of local and regional economies, providing access to the national air transportation system for a wide range of business needs.

Civil Air Terminal/Dover AFB

While the Civil Air Terminal is not technically an airport, it is adjacent to Dover AFB - the largest airport in Delaware. The Civil Air Terminal shares the runway system with Dover AFB for currently qualified civil aircraft operations. For the future, there are a number of possible scenarios that are likely to change the use and character of the CAT. The Recommended Aviation System projects the following roles for the CAT:

- ***Potential Full Civilian/Military Joint Use:*** If this joint use involves a Base Realignment, it will impact the actual development at the CAT. For example, if the Base is available for civilian aviation via Air Force mission realignment, many of the expansion plans for the CAT would not be required. However, the Recommended Plan assumes full joint use without military mission realignment. Thus, the CAT would be subject to capital improvement plans for its expansion.
- ***Potential Airline Service:*** Ongoing air service improvement efforts have identified an airline that desires to initiate service to Dover. Should this occur, the CAT terminal

building and parking area would be improved to accommodate this new passenger demand.

- ***Wide-body Jet Air Cargo Overnight Parking:*** There are plans underway to expand the CAT ramp to permit overnight parking by B-747 or similar aircraft used by supplemental carriers in the Civil Reserve Aircraft Fleet military airlift program.
- ***NASCAR Race Aircraft Parking:*** The CAT will continue to serve as the location for NASCAR aircraft drop off and pick up during race weekends.

Total civilian operations at the CAT, not including the air cargo carrier overnight parking, is anticipated to be 5,500 by the year 2030.

New Castle Airport

New Castle Airport is poised to become a corporate airport of choice within the south Philadelphia/northern Delaware Metroplex. However, there have been repeated suggestions that airline service be incorporated into the airport's mission. In the past New Castle Airport has had scheduled airline service and has produced a number of passengers. However, its proximity to Philadelphia International Airport (PHL) and the decision of some low cost carriers to enter the PHL market have made it very difficult to sustain conventional airline service at New Castle Airport.

For the Recommended Aviation System, New Castle Airport stands as the busiest general aviation airport in Delaware. It is anticipated to accommodate 249 based aircraft and more than 92,000 aircraft operations. Should airline service eventually be located at the airport, it will likely increase the operational totals and will require terminal area improvements. However, if these changes occur, they will not significantly impact any other airports within the Recommended Aviation System.

Sussex County Airport

Current plans for Sussex County Airport are to extend their current runway to 6,000 feet of useable length. This will require the relocation of US-9T in order to achieve the needed runway length. It is anticipated that this runway extension will permit the aircraft modification and refurbishment company (PATS) to accommodate larger aircraft. Ultimately, it is believed that this action will save the PATS jobs at Sussex County Airport. In addition, the runway extension will serve to make Sussex County Airport more competitive in the future with other jet-capable airports in the region. The Recommended Aviation System projects that Sussex County Airport will accommodate 82 based aircraft and 44,800 aircraft operations by the year 2030.

2.3 Airport Facilities

Tables 7-3 through 7-9 present summaries of individual airport facility recommendations. The descriptions and recommendations for many of these facilities reflect input from coordination meetings, master plans, and other fine-tuning adjustments not previously shown. It should be noted that the facility recommendations in this plan are considered "minimum" requirements in order to support an airport system to meet future needs. Development above these levels should be undertaken if aviation activity forecasts are exceeded, or local airport activity indicates a specific need. Such activity includes local economic growth such as corporate expansions or relocations, which could increase operations, need for additional aircraft storage, or air charter activity.

Table 7-3 - Chorman Airport

ITEM	Existing	2015	2020	2030	Incremental
Facility Characteristics					
Ownership	Private	Private	Private	Private	
ARC Classification	Less than B-I	Less than B-I	Less than B-I	B-I	
Instrumentation	None	None	None	Non-Precision	
Runway Configuration	Single	Single	Single	Single	
Primary Runway Dimensions	3,588' x 37'	3,588' x 37'	3,588' x 37'	3,600' x 60'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Turn-around	Turn-around	Turn-around	Parallel	
Demand/Capacity					
Based Aircraft	19	21	22	25	
Annual Operations	13,200	14,600	15,300	17,300	
Annual Service Volume	53,100	53,100	53,100	53,100	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	14,750	-	-	24,000	24,000
Runway Overlay	-	-	-	-	-
Taxiway Paving	-	-	-	6,000	6,000
Taxiway Overlay	-	-	-	-	-
Apron Paving	2,900	-	-	3,700	3,700
Auto Parking	350	-	-	700	700
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	-	-	-	500	500
Conventional Hangars	48,760	-	-	-	-
T-Hangars	8	-	-	-	-
LIGHTING/NAVAIDS	(linear ft./	(linear ft./	(linear ft./	(linear ft./	(linear ft./

Table 7-3 - Chorman Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
	Units)	Units)	Units)	Units)	Units)
Runway Lighting	3,588' LIRL	3,588' LIRL	3,588' LIRL	3,600' MIRL	3,600' MIRL
VAGL	2	-	-	-	-
REIL	-	-	-	2	2

Legend: LIRL=Low Intensity Runway Lights; MIRL=Medium Intensity Runway Lights; VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-4 - Delaware Airpark					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Public	Public	Public	Public	
Classification	B-I	B-II	B-II	B-II	
Instrumentation	Non-Precision	Non-Precision	Non-Precision	Non-Precision	
Runway Configuration	Single	Single	Single	Single	
Primary Runway Dimensions	3,582' x 60'	4,200' x 75'	4,200' x 75'	4,200' x 75'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Parallel	Parallel	Parallel	Parallel	
Demand/Capacity					
Based Aircraft	56	61	65	74	
Annual Operations	22,650	24,600	26,300	29,900	
Annual Service Volume	171,300	171,300	171,300	171,300	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	23,880	35,000	-	-	35,000
Runway Overlay	-	-	-	-	-
Taxiway Paving	10,728	8,626	-	-	8,626
Taxiway Overlay	-	-	-	23,880	23,880
Apron Paving	11,222	-	-	-	-
Auto Parking	1,470	350	350	350	1,050
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	3,400	-	-	-	-
Conventional Hangars	6,800	-	10,900	-	10,900
T-Hangars	18	12	14	18	44
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	3,582	4,200	-	-	4,200
VAGL	-	2	-	-	2

Table 7-4 - Delaware Airpark					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
REIL	-	2	-	-	2

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-5 - Civil Air Terminal/Dover AFB (Full Joint Use)					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Public/Military	Public/Military	Public/Military	Public/Military	
Classification	E-VI	E-VI	E-VI	E-VI	
Instrumentation	Precision	Precision	Precision	Precision	
Runway Configuration	Intersecting	Intersecting	Intersecting	Intersecting	
Primary Runway Dimensions	9,602' x 200'	9,602' x 200'	9,602' x 200'	9,602' x 200'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Parallel	Parallel	Parallel	Parallel	
Demand/Capacity					
Based Aircraft	-	-	-	21	
Annual Operations	600	800	1,000	5,500	
Annual Service Volume	13,700	13,700	13,700	230,000	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	428,430	-	-	-	-
Runway Overlay	-	-	-	-	-
Taxiway Paving	327,800	-	-	-	-
Taxiway Overlay	-	-	-	-	-
Apron Paving (CAT)	31,415	63,700	-	-	63,700
Auto Parking	2,100	3,500	-	-	3,500
BUILDINGS (CAT)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	1,980	-	-	4,000	4,000
Conventional Hangars	-	-	-	19,600	19,600
T-Hangars	-	-	-	11	11
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	22,505	-	-	-	-
VAGL	4	-	-	-	-
REIL	4	-	-	-	-

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-6 - Laurel Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Private	Private	Private	Private	
Classification	Less than A-I	Less than A-I	Less than A-I	Less than A-I	
Instrumentation	Non-Precision	Non-Precision	Non-Precision	Non-Precision	
Runway Configuration	Single	Single	Single	Single	
Primary Runway Dimensions	3,175' x 230'	3,175' x 230'	3,175' x 230'	3,175' x 230'	
Runway Surface	Turf	Turf	Turf	Turf	
Taxiway Type	Turf	Turf	Turf	Turf	
Demand/Capacity					
Based Aircraft	14	15	16	18	
Annual Operations	8,950	9,600	10,200	11,600	
Annual Service Volume	32,200	32,200	32,200	32,200	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	None	-	-	-	-
Runway Overlay	None	-	-	-	-
Taxiway Paving	None	-	-	-	-
Taxiway Overlay	None	-	-	-	-
Apron Paving	None	-	-	-	-
Auto Parking	None	-	-	-	-
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	290	-	-	-	-
Conventional Hangars	6,900	-	-	-	-
T-Hangars	20	-	-	-	-
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	None	-	-	-	-
VAGL	None	-	-	-	-
REIL	1	1	-	-	1

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-7 - New Castle Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Public	Public	Public	Public	
Classification	D-III	D-III	D-III	D-III	
Instrumentation	Precision	Precision	Precision	Precision	

Table 7-7 - New Castle Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Runway Configuration	Intersecting	Intersecting	Intersecting	Intersecting	
Primary Runway Dimensions	7,012' x 150'	7,012' x 150'	7,012' x 150'	7,012' x 150'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Parallel	Parallel	Parallel	Parallel	
Demand/Capacity					
Based Aircraft	189	205	219	249	
Annual Operations	78,840	84,800	90,000	101,000	
Annual Service Volume	194,000	194,000	194,000	194,000	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	314,817	-	-	-	-
Runway Overlay	-	-	-	314,817	314,817
Taxiway Paving	352,636	-	-	-	-
Taxiway Overlay	-	-	-	352,636	352,636
Apron Paving	74,102	-	-	9,900	9,900
Auto Parking	16,590	-	-	-	-
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	27,200	-	-	-	-
Conventional Hangars	570,000	-	-	-	-
T-Hangars	72	-	-	-	-
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	18,889	-	-	-	-
VAGL	4	-	-	-	-
REIL	3	-	-	-	-

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-8 - Summit Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Private	Private	Private	Private	
Classification	B-II	B-II	B-II	B-II	
Instrumentation	Non-Precision	Non-Precision	Non-Precision	Non-Precision	
Runway Configuration	Intersecting	Intersecting	Intersecting	Intersecting	
Primary Runway Dimensions	4,488' x 65'	4,488' x 65'	5320' x 65'	5320' x 65'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Parallel	Parallel	Parallel	Parallel	

Table 7-8 - Summit Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Demand/Capacity					
Based Aircraft	43	47	50	57	
Annual Operations	41,400	45,400	48,200	55,000	
Annual Service Volume	170,800	170,800	170,800	170,800	
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	32,413	-	6,010	-	6,010
Runway Overlay	-	-	-	32,413	32,413
Taxiway Paving	14,020		3,333	-	3,333
Taxiway Overlay	-	-	-	14,020	14,020
Apron Paving	48,720	-	-	-	-
Auto Parking	4,375	3,500	-	3,500	7,000
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	10,200	-	-	-	-
Conventional Hangars	33,000	-	-	-	-
T-Hangars	31	-	9	-	9
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	4,488	-	832	-	832
VAGL	2	-	-	-	-
REIL	2	-	-	-	-

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

Table 7-9 - Sussex County Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Characteristics					
Ownership	Public	Public	Public	Public	
Classification	B-III	B-III	C-III	C-III	
Instrumentation	Non-Precision	Non-Precision	Precision	Precision	
Runway Configuration	Intersecting	Intersecting	Intersecting	Intersecting	
Primary Runway Dimensions	5,000' x 150'	5,000' x 150'	6,000' x 150'	6,000' x 150'	
Runway Surface	Asphalt	Asphalt	Asphalt	Asphalt	
Taxiway Type	Parallel	Parallel	Parallel	Parallel	
Demand/Capacity					
Based Aircraft	62	67	72	82	
Annual Operations	33,900	36,600	39,400	44,800	
Annual Service Volume	174,500	174,500	174,500	174,500	

Table 7-9 - Sussex County Airport					
ITEM	**Existing**	**2015**	**2020**	**2030**	**Incremental**
Facility Needs	**Existing**	**Additional Phase 1**	**Additional Phase 2**	**Additional Phase 3**	**Incremental Totals**
PAVING	(s.y.)	(s.y.)	(s.y.)	(s.y.)	(s.y.)
Runway Paving	109,242	-	16,667	-	16,667
Runway Overlay	-	-	-	109,242	109,242
Taxiway Paving	49,444	-	8,889	-	8,889
Taxiway Overlay	-	-	-	49,444	49,444
Apron Paving	45,628	-	-	-	-
Auto Parking	8,400	-	-	-	-
BUILDINGS	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)	(s.f./Units)
Terminal	6,150	-	-	-	-
Conventional Hangars	213,850	-	-	-	-
T-Hangars	18	-	-	10	10
LIGHTING/NAVAIDS	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)	(linear ft./ Units)
Runway Lighting	8,109	-	1,000	-	1,000
VAGL	4	-	-	-	-
REIL	4	-	-	-	-

Legend: VAGL=Visual Approach Guidance Lights; REIL=Runway End Identifier Lights

2.4 Capital Cost Estimates

Capital development costs for the Recommended Aviation System were estimated to total $96,556,400. These cost estimates correspond to the recommended facility development schedules shown previously in this System Plan, but do not include engineering and/or contingency fees. In this analysis, both publicly and privately owned airports were shown as requiring facility development or capital maintenance. Several sources were used in developing cost estimates to assure that relatively accurate costs were derived. These sources included:

- RSMeans construction cost data.[1]
- Cost data from other statewide aviation planning documents.
- Examination of Airport Capital Improvement Plans (ACIPs) filed with the FAA.

Obstruction removal costs, estimated in Chapter 6, were included in each future planning phase to show an approximate need for those funding resources. In this regard, the removal costs were divided equally among the planning periods, reflecting a consistent annual funding effort to improve aviation system safety.

[1] Source: http://rsmeans.reedconstructiondata.com/

Total capital costs have been assigned to short, intermediate, and long term phases, in recognition that some portion of total capital development costs will be expended in sooner than others, depending on demand placed on the airport. Table 7-10 presents these costs which show $29,658,700 for Phase 1, $17,435,800 for Phase 2, and $49,461,900 for the long range period.

Table 7-10 - Airport Costs

Airport	Phase 1	Phase 2	Phase 3	Total
Chorman Airport	$0	$0	$4,378,500	$4,378,500
Delaware Airpark	$19,863,700	$2,702,500	$2,203,300	$24,769,500
DelDOT Helistop	$0	$0	$0	$0
Dover AFB CAT	$8,774,500	$0	$4,685,000	$13,459,500
Laurel Airport	$75,000	$0	$0	$75,000
New Castle Airport	$0	$0	$24,697,400	$24,697,400
Summit Airport	$175,000	$1,848,100	$1,800,200	$3,823,300
Sussex County Airport	$0	$11,344,200	$6,304,000	$17,648,200
Obstruction Removal Costs	**$770,500**	**$1,541,000**	**$5,393,500**	**$7,705,000**
Total	**$29,658,700**	**$17,435,800**	**$49,461,900**	**$96, 556,400**

It should be noted that these costs estimates are just that - estimates. More detailed studies (master planning) must be undertaken to calculate precise cost figures, which can be used to procure bids for design, engineering, and construction.

3. SUMMARY

IN SUMMARY, IT CAN BE STATED THAT there are a number of changes that are anticipated for Delaware's aviation system over the next 20 years. These changes are related to the future impacts of technology, fuel prices, aircraft costs, declining pilot population, and the growing need for business aviation. The Recommended Aviation System Plan for Delaware incorporates the following predictions:

- It is likely that Dover AFB will become a full joint-use facility for civilian and military aircraft operations.
- The Civil Air Terminal is projected to become an air cargo overnight parking facility, with significant infrastructure improvements including more than 60,000 square yards of reinforced pavement capable of accommodating multiple wide-body jet aircraft.
- It is likely that three privately owned, public-use airports will become private-use airports within the planning period:
  - Chandelle Estates
  - Jenkins
  - Smyrna
- Chorman Airport is anticipated to develop a new runway at some point during the planning period.
- Because of the anticipated joint use at Dover AFB, Delaware Airpark is projected to expand to only 4,200 feet of runway length throughout the planning period.
- Laurel Airport is projected to remain within the public-use system because of its important training role for skydivers and its aerial spray operations.
- New Castle Airport is anticipated to continue its focus on corporate aviation. However, there may be some movement toward airline activity accommodation toward the end of the planning period.
- Summit Airport is anticipated to expand its runway by 832 feet for a total of 5,320 feet.
- Sussex County Airport is projected to expand its runway to 6,000 feet of useable length.

The cost of the Recommended Aviation System is estimated at $96.6 million for all three periods. In the next Chapter of this report, a detailed discussion of the funding requirements, by eligible agency will be undertaken. In addition, recommendations for policy issues, implementation process, and contingency planning will be presented.

Chapter 8:
Financial and Implementation Plan

Financial and 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
- Implementation Plan
  - Implementation Strategy – ACV Input
  - Continuing Planning Process

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. Discussed below are each of the components of the financial plan for the Recommended Aviation System.

1.1 Capital Improvement Program

The capital improvement program for the Recommended Aviation System has been identified by short (2010-2015), intermediate (2016-2020), and long range (2021-2030) 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 2012 dollars for the 20 year (2010-2030) program is estimated at $96,556,400. 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: $65,497,900
- State Funding: $14,767,400
- Local Funding: $5,659,100
- Private Funding: $10,632,000
- TOTAL $96,556,400

The calculation of these costs estimates relied upon a number of assumptions regarding Federally-eligible projects, and those funded through State, Local/Sponsor, and Private resources.

Table 8-1 - Airport Funding Eligibility

SASP Facility	2015	2025	2030	Total Costs
Chorman Airport	$0	$0	$4,378,500	$4,378,500
Federal	$0	$0	$0	$0
State	$0	$0	$3,356,100	$3,356,100
Local	$0	$0	$522,900	$522,900
Private	$0	$0	$499,500	$499,500
Total	**$0**	**$0**	**$4,378,500**	**$4,378,500**
Civil Air Terminal/Dover AFB	$8,774,500	$0	$4,685,000	$13,459,500
Federal	$7,739,600	$0	$0	$7,739,600
State	$430,000	$0	$0	$430,000
Local	$605,000	$0	$920,000	$1,525,000
Private	$0	$0	$3,765,000	$3,765,000
Total	**$8,774,500**	**$0**	**$4,685,000**	**$13,459,500**
Delaware Airpark	$19,863,700	$2,702,500	$2,203,300	$24,769,500
Federal	$17,051,600	$0	$752,200	$17,803,800
State	$947,300	$0	$41,800	$989,100
Local	$964,800	$17,500	$59,300	$1,041,600
Private	$900,000	$2,685,000	$1,350,000	$4,935,000
Total	**$19,863,700**	**$2,702,500**	**$2,203,300**	**$24,769,500**
Laurel Airport	$0	$0	$0	$0
Federal	$0	$0	$0	$0
State	$67,500	$0	$0	$67,500
Local	$0	$0	$0	$0
Private	$7,500	$0	$0	$7,500
Total	**$75,000**	**$0**	**$0**	**$75,000**

Table 8-1 - Airport Funding Eligibility				
SASP Facility	**2015**	**2025**	**2030**	**Total Costs**
New Castle Airport	$0	$0	$24,697,400	$24,697,400
Federal	$0	$0	$22,227,600	$22,227,600
State	$0	$0	$1,234,900	$1,234,900
Local	$0	$0	$1,234,900	$1,234,900
Private	$0	$0	$0	$0
Total	**$0**	**$0**	**$24,697,400**	**$24,697,400**
Summit Airport	$175,000	$1,848,100	$1,800,200	$3,823,300
Federal	$0	$1,055,800	$1,462,600	$2,518,500
State	$0	$58,700	$81,300	$139,900
Local	$175,000	$58,700	$256,300	$489,900
Private	$0	$675,000	$0	$675,000
Total	**$175,000**	**$1,848,100**	**$1,800,200**	**$3,823,300**
Sussex County Airport	$0	$11,344,200	$6,304,000	$17,648,200
Federal	$0	$10,209,800	$4,998,600	$15,208,400
State	$0	$567,200	$277,700	$844,900
Local	$0	$567,200	$277,700	$844,900
Private	$0	$0	$750,000	$750,000
Total	**$0**	**$11,344,200**	**$6,304,000**	**$17,648,200**
Obstruction Removal				
State	**$770,500**	**$1,541,000**	**$5,393,500**	**$7,705,000**
Total SASP Funding Sources				
Federal	**$24,791,200**	**$11,265,600**	**$29,441,000**	**$65,497,900**
State	**$2,215,300**	**$2,166,900**	**$10,385,300**	**$14,767,400**
Local	**$1,744,800**	**$643,400**	**$3,271,100**	**$5,659,200**
Private	**$907,500**	**$3,360,000**	**$6,364,500**	**$10,632,000**
Total	**$29,658,800**	**$17,435,900**	**$49,461,900**	**$96,556,500**

1.2 Capital Funding Eligibility

Capital funding eligibility is based upon a number of factors including the type of project, the type of sponsorship at the airport in question, and its eligibility and priority for FAA Airport Improvement Program (AIP) funding. Funding descriptions for each of the categories described above are presented in the following paragraphs.

Federal Funding

The largest single source for airport development funds is the Federal government. Most airport development items such as land, runways, taxiways, and apron areas are eligible for 90 percent Federal participation at publicly owned airports and some grandfathered reliever airports (regardless of ownership). At New Castle, Delaware Airpark, and Sussex County airports, eligible projects include the planning, design, and construction of projects associated with public use non-revenue generating facilities and equipment of the Airport. Typical AIP-eligible projects include: airport master plans and airport layout plans; land acquisition and site preparation, airfield pavements, e.g. runways, taxiways, and transient aprons; lighting and navigational aids; safety, security, and snow removal equipment; selected passenger terminal facilities; and obstruction identification and removal. Highest funding priority according to FAA's rating procedure is generally given those projects that are safety related such as obstruction removal, runway safety area improvements and facility improvements to meet current FAA Airport Design Standards.

The most recent legislation enacted to authorize funding for FAA projects is the FAA Modernization and Reform Act of 2012. The law is designed to provide the FAA with $63.6 billion between 2012 and 2015. It is important to note, that this Reauthorization Act includes funding eligibility for some revenue producing facilities such as fuel farms and hangars at nonprimary airports. These items can be supported by the eligible airport's nonprimary entitlement funding if the airport sponsor has made adequate provision for financing airside needs of the airport.

Of the capital improvements needed for the Recommended Aviation System Plan by the year 2030, nearly $65.5 million are eligible for Federal funding. Over the 20-year planning period, the total requirement averages almost $3.3 million annually. Based on the historical record of AIP apportionment funding for Delaware airports, it is clear that this total is significantly larger than historical contributions of FAA to the State's airports. For example, FY 2012 Apportionment funding for Delaware is roughly $402,000 – significantly below the average $3.3 million needed. Therefore, Delaware will need a considerable amount of FAA discretionary funding to achieve capital development funding for the Recommended Aviation System.

State Funding

An amendment to the Aeronautics Code in 1996 changed the scope of State funding to include privately owned public-use airports. In this regard, the State is empowered to fund any public-use airport - whether privately owned or publicly owned - in the acquisition, development, operation, or maintenance of the facility. Sources of funds for these projects can be generated through fees, taxes, and other sources applicable to aeronautics and administered by DelDOT and its Office of Aeronautics. This considerably broader scope of funding capability has

positively impacted the continuing viability of the privately owned airports in Delaware. However, it has increased the need for State aviation funding.

The estimate of State funding needed for airport improvements listed in the Recommended Aviation System Plan is approximately $7 million through the year 2030. However, additional funding of $7.7 million is necessary for airport obstruction removal. Together, these system improvements increase the level of State funding required to $14.77 million through 2030.

Legislative proposals have been made that will broaden the revenue collection base for the State by imposing registration fees for aircraft registered in Delaware and the imposition of a new tax on Jet A fuel amounting to $0.05 per gallon. For both of these new fees, a dedicated fund for aviation would be created, assuring aviation users that their funds are being recycled into the aviation system.

Local Share Funding

Local airport sponsors such as counties, municipalities, other political subdivisions, or private owners are responsible for costs associated with airport development projects that remain after Federal and State shares have been applied. The cost of projects not eligible for Federal or State funds is paid through local or private funds and is wholly the responsibility of the local sponsor. For publicly owned airports, this sponsor share of the eligible project cost is as follows:

- 5 percent for Federally eligible projects
- Variable percentage for non-FAA eligible projects where State funds are used.[1]
- 100 percent for non-Federal and non-State eligible projects.

For privately owned airports, the private owner share is 100 percent for the non-State eligible projects (no private airports in Delaware are now eligible for Federal funding).

Local sponsors of publicly owned Delaware SASP airports have been identified as the source for almost $5.7 million in capital development projects enumerated in this plan. Just as with the State estimate, this does not include numerous discretionary projects, maintenance programs, or equipment purchases that public use airports may require during the planning period. Local airport sponsors must rely upon funding from four primary sources:

- Airport-Generated Revenues
- Loans Based on Anticipated Revenues
- General Fund Revenues (for publicly owned airports)
- Bond Issues

[1] State funding procedures in this area are not precise.

Airport-generated revenues are available to both public and private airport sponsors. General fund revenues and bond issues are typically only available to public airport sponsors that have taxing authority.

Airport-Generated Revenues

Owners and operators of profitable airports use operating revenues to fund the sponsor share of development funds. In Delaware, the privately owned airports must be profitable or at least break even over the long term in order to survive. Whether there is money available for capital development after operating expenses have been paid will differ by airport. In the past, New Castle Airport has been the only publicly owned airport in the State to have been financially self-sufficient except for certain large capital improvement projects. Sussex County Airport and Delaware Airpark have required operating subsidies. However, with the decrease in projected capital funding by FAA there is an increasing emphasis on airport self-funding for both operating costs and capital projects. With this in mind, typical revenue sources at general aviation airports include:

- Fuel Flowage Fees
- Aircraft Storage Fees and Tie Down Fees
- Rents and Leases
- Sales and Service
- Other Miscellaneous Fees

Experience has shown that only large general aviation airports in busy metropolitan areas can successfully charge landing fees. Landing fees at other less congested general aviation airports tends to drive users away to the non-landing fee facilities.

General Fund Revenues

General fund revenues refer to tax-supported financing of airport operations and capital development programs. General funds are derived from tax revenues that have not been directed toward a specific area or project as a prerequisite to their collection. The amount of general fund support for airport improvement projects is based upon the local tax base, priority of the development project, historical funding trends and, of course, local attitudes concerning the importance of aviation.

Bond Issues

Bond issues that fund the local share of airport development projects must compete with bond issues for other types of community improvements, schools, highways, and sewer systems. In addition, limitations on municipal debt are imposed for all counties in Delaware.

Most general aviation airports do not qualify for revenue bond issues because they do not earn surplus revenues capable of paying off such bonds. Rather, general obligation bonds would be used if debt financing was required for an airport project. General obligation bonds are based on the full faith and credit of the issuer and do not depend upon revenue from the specific project. Like the general fund apportionment, bond issues supporting airport development depend greatly on the priority assigned to such projects by the local community.

Private Funding

Privately-owned, public-use facilities are not eligible for Federal funding for capital improvement projects. Therefore, improvements must be funded by the airport owner, and/or other sources that can be identified. In the Recommended Aviation System Plan, improvements at Chorman Airport were assumed to be funded by State grants. Laurel Airport has only one significant capital cost identified during the planning period – a visual approach slope indicator. The other privately owned airports, Chandelle Estates, Jenkins, and Smyrna Airport were assumed to become private-use facilities and thus, not be counted as a part of the public-use system in the long term.

Private enterprise funding of capital development is defined as the funding needed to support all non-governmentally eligible projects. The system plan calls for some State funding at two private airports (Chorman and Laurel) for which, private enterprise funding will be needed for the local share match. Private funding for the Recommended Aviation System Plan is needed for the development of conventional hangars and T-hangars, and for matching funds for runway/taxiway development at Chorman and for visual approach slope aids at Laurel. A total of over $10.6 million of investment is needed from private sources through the year 2030.

Due to the nature of private enterprise and free market economics, there is no way to forecast levels of private capital that may be available. Market forces of supply and demand will determine prices and decisions to invest will likely be based on risk, general economic health, and the outlook of the aviation industry. Therefore, it can only be assumed that private investment will occur if sufficient profit is available for the project. If private investment is slow to materialize, it is assumed that non-operational, revenue producing projects will be postponed into the future.

2. IMPLEMENTATION PLAN

THE IMPLEMENTATION PLAN DESCRIBES SPECIFIC METHODS FOR accomplishing the recommendations in the Delaware State Aviation System Plan Update. These methods were developed to ensure the practicality and flexibility of the plan. To adequately address the implementation strategies, this section is organized to include the following:

- Implementation Strategy – ACV Input
- Continuing Planning Process

2.1 Implementation Strategy – ACV Input

For this system plan update, one strategy that was developed for Plan implementation involved the use of the Airport/Community Value (ACV) scores from recent work that could be updated and modified to provide benchmarks for capital spending, similar to other modes of transportation. These benchmarks or "report cards" on DelDOT spending will help the Department spend its resources in accordance with the system plan. In addition, it is important to show when the Office of Aeronautics invests in the system, they are actually moving the system forward/improving its performance.

ACV Description

ACV metrics employed in this plan are both the estimate of economic impact (total output) combined with estimates of the existing value of an airport. This method is analogous to examining both an income statement and a balance sheet when looking at the financial health of a business. These baseline values can then be subjected to a number of sustainability assessment factors called Economic Sustainability Factors (ESF) in reaching a future estimate of an overall Airport Community Value.

Both traditional and new methods of economic impact analysis are used in this process. The "Airport Community Value" method incorporates familiar measures of job, income, and total output figures along with new metrics for estimating the value of an airport to a community. The process adds the existing value components and establishes a base year ESF score for each airport. For the future, the operational economic activity plus any capital investment is multiplied by the change in future ESF to yield the actual value of the future airport investments. This total is then added to the future (depreciated or appreciated) value of the airport to arrive at a future ACV. Thus, there are "before" and "after" ACV sets showing existing and future projected values. It is the future projected values that will have the greatest impact on system planning funding recommendations and priorities in this analysis. The measures include the following factors:

Existing Value Components

- Economic Impacts From Activity
- Airport Property and Facility Value
  - Replacement Value
  - Current Costs of Facilities Based on Useful Life Estimates

Economic Sustainability Factors (Sustainability Assessment)

- Regional Airport Resource Factor
  - Geographic Coverage
- Airport Protection Factor
  - Land Use and Zoning Controls around Airport
- Location/Access
- Business Use Index
  - Multi-engine Propeller
  - Business Jet
- Expandability Factor
  - Airside, Landside
- Community Commitment Factor
  - Plans on File
  - Community Use of Airport

Future Value Additions

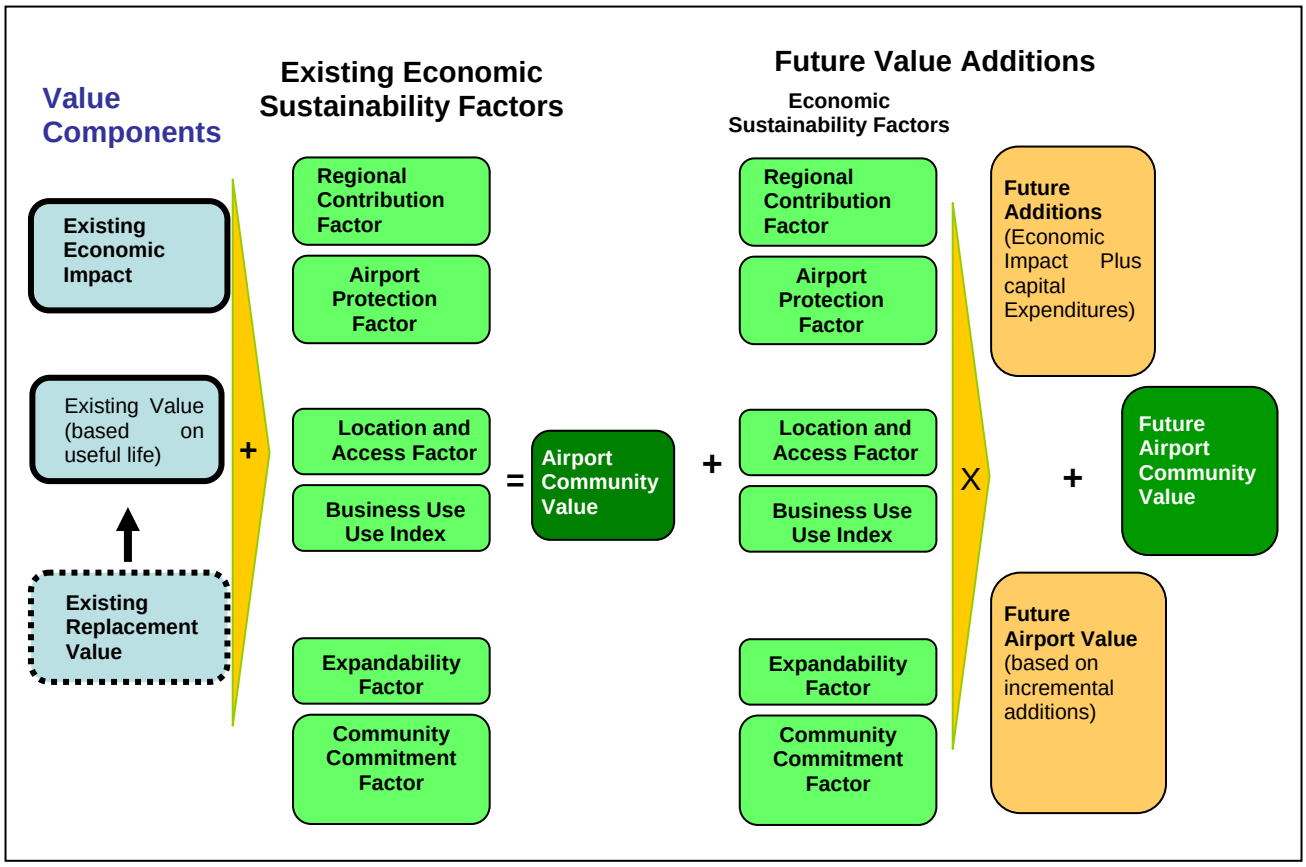
- Economic Impacts From Future Activity
  - Recommended Plan Impacts Included
- Airport Replacement Value
  - Recommended Plan Capital Spending Included
- Economic Sustainability Factors
  - Proactive Measures That Can Increase or Decrease Airport Investment Value

A community can, at any time change its future ACV by undertaking actions impacting the Economic Sustainability Factors (ESF). For example, by lengthening a runway, an airport may increase its accommodation of business aviation, raising its Business Use Index (BUI). If the community is willing to commit dollars to capital improvements, this can increase the Community Commitment Factor (CCF) and so on. Taken together, these proactive measures can increase the value of an airport to a community. Local and regional planners as well as decision-makers can use this tool to measure their airports' ACV and to estimate return on investment from their future capital contributions. Figure 8-1 presents a graphic illustration of the ACV estimation process. Methods for collecting or developing these measures are described in the following subsections.

Existing Value Components

Existing value components were estimated through the system planning process using existing economic impact assessment numbers. This includes the number of existing jobs, the amount of income produced, and the total output for each system airport. In addition to the economic impact, an estimate of the current value of the system airport were developed, using a replacement cost basis or replacement value minus useful life estimates of existing facilities. These numbers will be updated in 2013, but they are not the specific components that determine future airport investment value. Rather, the ESF changes are used in that determination.

Figure 8-1 – Airport Community Value Modeling Process



Source: R.A. Wiedemann & Associates, Inc.

Economic Sustainability Factors (Sustainability Assessment)

The existing values for economic impact and airport replacement costs offer a baseline estimate of overall economic value. However, this value is a static snapshot of a constantly moving economic flow. The six primary factors that modify these values are discussed below.

Regional Airport Resource Factors

Airports are regional resources that serve areas beyond their immediate sponsors' political boundaries. As entry points to the nation's airspace system, airports can be considered "on-ramps" to the national air transportation system. A loss of such a facility reduces the overall service level of the national and regional system to some degree. The regional system plan should place a value on the on-going operations or expansion of each airport as a resource worthy of protection. Although it can be argued that all airports contribute to their local communities, this value differs on a case-by-case basis. This value can be estimated on a systems level using geographic coverage as one parameter. Using normal system planning guidelines of geographic coverage, a rating system should include:

- The classification of airport type (jet-capable, single-engine, etc.), which indicates the service level available at that location.
- The population served by the airport as measured within 30 minutes of driving.

Loss of an airport in any category would be scored negatively using a point system defined later in this section.

Airport Protection Factor

Communities that take measures to protect their airports are increasing the value of their investment. Protection of airport facilities includes any action that increases land use and zoning controls to ensure compatible land uses near the site. This also includes appropriate height hazard zoning. Scoring this factor involves the following primary components:

- Control of Runway Protection Zone
- Runway Safety Areas in Place
- Land Use Compatibility
- Height Hazard Zoning for Airport
- Other Protective Zoning for the Airport

Location/Access Factor

When speaking of location or access, the factor being measured is convenience. The primary reason for using air transportation is to save travel time. In this regard, access to an airport by

ground is critical. The relative ease by which an airport can be accessed increases its value to the local community and to the regional system of airports. Similarly, the location of the airport relative to the community it serves is a factor that increases convenience for users. Scoring for this factor includes the following two primary criteria:

- Surface access within three miles of the airport on interstate, regional arterial, local arterial, freight or passenger rail
- Location of the airport in relation to economic activity centers, major employers, central business districts, et cetera

Business Use Index

Similar to geographic coverage, airports should be scored relative to their accommodation of business aviation. As described in this system plan, business aviation has a much brighter future than most other general aviation use. 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:

- The ability to accommodate business aviation as measured by airport classification
- The number of business type aircraft (jet, multi-engine propeller) already based at the airport as well as the number of itinerant operations

Expandability Factor

The ability of an airport to expand is a significant factor in its future value to the community it serves. If an airport cannot expand, there is limited return on additional capital investment in the facility, since the population of aircraft it serves will not be significantly altered. For this factor, two primary criteria are used as a gauge. The first involves the ability to expand within existing airport property. Both airside and landside are included in this scoring. The second gauge is the potential ability of the airport to expand outside of its existing property boundaries. This measure should be qualitatively assessed, though non-park or wetland open space can exist outside airport boundaries, primarily off existing runway ends. Scoring items include the following:

- On-airport expandability, airside and landside
- Off-airport expandability, primarily off existing runway ends

Community Commitment Factor

The level of community commitment to a local airport is an important factor in assessing its existing and future value. Communities that have developed current master plans and that have airport capital improvement programs on file with funding agencies can be considered proactive in this area. In addition, examining the operations of the airport compared its service area population is a good measure of community support. Airports that show a low utilization ratio when weighed against their service air population are not considered supported by their aviation user groups. Criteria used in ranking community commitment include the following:

- Current plans on file with funding agencies such as airport master plans, airport capital improvement programs, airport zoning plans, FAR Part 150 studies, and airport business plans
- Total aircraft operations at the airport divided by service area population

Method for Evaluation of ACV Scoring

This section presents the method for evaluation of ACV scoring for airports included in the system plan modeling process. All of the ESF are assigned evaluation values, based upon the criteria described above. All of the factors except the Business Use Index (BUI) have the potential of scoring between zero and four points in the matrix. Because of its overall importance in aviation's future, the BUI scoring ranges from one to eight, essentially giving it double the weight of other evaluation factors.

No airport is confined to its current ACV score. By implementing any of the actions listed as factors in the process, the ACV can be altered. With changing economic conditions, the ACV is a fluid number, moving with supply and demand, investment capital, and policy changes designed to protect local airports. Because of this ability to alter an ACV, a methodology to estimate future ACV is included in this section. This future add-on value is estimated from the increases in projected aviation activity and capital investment at each airport. The ACV methodology permits decision-makers to estimate a return on investment, which can be incrementally impacted by proactive measures described in the ESF section.

Matrix Scoring System

The matrix scoring system used to estimate existing Airport Community Values for each system airport was developed in a previous working paper. The scores include measures of the various inputs described in the preceding sections of this report. The subtotal of the existing ACV is simply the existing total economic output combined with the existing airport value with useful life reductions. This dollar amount is accompanied by an ESF.

ESFs are useful for all future actions and investments in the airport. Each ESF with the exception of the BUI has a maximum point total of four. The BUI has a maximum point total of eight. The maximum point total for an airport under the ESF rating system is 28. The ranking of airports with regard to their existing ESF score does not imply a best-to-worst rank order. Instead, the ranking shows the leeway for each airport to adjust its future ACV. Those with lower ESF scores have more potential to improve their future ACV than those at the very top. This improvement potential implies that future investments in the airport can have a high rate of return if the future ESF is increased.

Airport Replacement Value and Existing Value Estimation

Key indicators of value involve the physical assets associated with airports and their infrastructure. By including the airport replacement value and the existing value estimation, a larger picture concerning the actual worth of the airport to the community is presented. Also, by introducing asset valuation, a mechanism for better measuring return on investment can be developed. Inputs needed for Airport Replacement Value estimates include the following:

- Total airport acreage and the most recent estimate of price per acre.
- Runway and taxiway area in square feet (length times width) and cost per square foot.
- Apron Area (in square feet) requires estimates either from airport management or from aerial photography, along with cost per square foot.
- Conventional hangar square footage.
- Number of T-hangar units.
- The fuel system replacement value is based on the size of the facility.
- The instrument approach capability places a value on those facilities or services, with non-precision valued at $500,000 and precision valued at $1,500,000.
- An air traffic control tower is valued at $2 million.
- Non-hangar buildings on the airport are valued at $230 per square foot.

Existing Airport Value with Useful Life Reductions are estimated for each airport using the replacement value estimates combined with knowledge of the age of the various facilities.

- Pavements are assumed to have a 20-year life.
- For hangars and non-hangar buildings, a 40-year life is assumed
- Other facilities were not reduced in value, since their replacement costs are assumed to increase at the same rate as their depreciation.

Future Value Additions

One of the purposes of the ACV modeling system is to provide good information concerning investment decisions in public infrastructure such as the local airport. Key to estimating return on investment is information about the assets involved, their potential for increasing the

return, or the risks associated with negative community actions that may threaten the viability of the airport. The ESF provides analysts with this information and capability. The inputs for the future ESFs follow the same method as for the existing ESF scoring with the exception that any known changes in these values should be recorded. This may include proactive measures by a community to protect their airport through zoning or planned runway expansions and greater business use. Changes to the future ESF are compared to the existing ESF and the percentage change is multiplied by the future funding/output additions and added to the future facility value. Essentially, the increase or decrease in value from the actual future funding or output additions is due to the change in ESF. Proactive measures that impact the ESF are the leverage that can be used by a community to increase its airport's value and the return on investment. Conversely, if negative actions occur such as residential encroachment, funding lapses, or loss of business aviation activity, the airport can show a value that is less than future amounts invested in its infrastructure.

Future ACV is based on the future capital investments multiplied by the ESF percentage change plus the future facility value. If the value of the future additions is desired, then the future facility value can be subtracted from the future ACV total. Depending upon the change in ESF, the value of future additions can be more or less than the actual amount invested in the airport.

ACV Scoring

The ACV metric described in the preceding sections was calculated for seven airports included in the Recommended Plan. The product of the exercise is an estimate of the following three values for each airport and for the system as a whole: the economic impact value; the existing (depreciated) airport asset value; and, the airport facility replacement value. To complete the ACV metric and to estimate the value of each airport to its community and the airport system in total, more than 20 discrete data values for each airport were researched and assembled into a database. This data correspond to those described in preceding sections.

Existing Value Components

Existing value components include the existing economic impact assessment data, the current value of the airport, and the replacement value of the airport. Existing value components were compiled or estimated for use in calculating each system airport as follows.

- ***Economic Impacts:*** Economic impacts include the number of existing jobs, the amount of income produced, the total output for each system airport, and the contributions in tax revenues to local and state jurisdictions. The data was taken from the most recent state wide Economic Impact Assessment[2] and was available through DelDOT.

[2] Source: Delaware Airports & Aviation Economic Impact Assessment, 2006

- ***Airport Property and Facility Value:*** Two estimates of existing airport values were used:
  - ***Replacement Value:*** The estimate of replacement values was calculated by multiplying unit costs of construction by the existing quantities of facilities to derive an approximate infrastructure investment need. Not included are the potential unknown costs or time delays related to environmental and land use constraints.
  - ***Existing/Depreciated Value:*** Estimates of an existing/depreciated facility value employed "useful life" estimates of facilities at system airports on a systematic basis across the State of Delaware. For instance, pavement life was reasonably assumed to be 20 years, and the useful life of buildings was assumed to be 40 years. Some estimates were made of the age of facilities if that data was not available for this study. These useful life estimates were then multiplied by the replacement value costs.

Economic Sustainability Factors

The existing values for economic impact and airport replacement costs discussed above offer a baseline estimate of facility values. However, these values are a snapshot of a constantly moving economic target. The ESFs discussed in this report address the market impacts of these values and offer insight into certain strategies that individual airport sponsors might consider to improve their airport values and economic impacts.

ACV Metric Results

Table 8-2 presents the results of the ACV input and scoring for all seven airports included in this study. Existing and replacement values were calculated by the ACV matrix.

Table 8-2 – Existing and Replacement Values

Airport Name	Total ACV	ESF Score	Total Output	Existing Value	Replacement Value
New Castle	$563,849,410	**23.92**	$272,111,000	$291,738,410	$337,207,584
Sussex County	$237,695,669	**15.44**	$151,048,700	$86,646,969	$120,823,600
Summit	$53,612,060	**15.14**	$27,997,100	$25,614,960	$49,462,904
Delaware Airpark	$21,807,838	**17.03**	$3,610,600	$18,197,238	$24,277,660
Civil Air Terminal*	N/A	**16.27**	N/A	$12,415,250	$14,479,400
Chorman	$13,485,246	**10.61**	$2,515,000	$10,970,246	$15,667,744
Laurel	$8,822,777	**7.58**	$3,121,900	$5,700,877	$7,326,900

* Civilian operations only

Total ACV represents the added value of the economic activity at an airport plus the existing asset value of that facility. As mentioned earlier, this snapshot of the overall value of an airport includes both the "income statement" and the "balance sheet" components of economic value. In one sense, the loss of the airport would eliminate both the economic activity and the asset value for the airport function. In addition to the Total ACV, the existing ESF scores are shown in Table 8-2.

Interpreting the results in the Table, New Castle Airport has the highest ACV of any airport in the region. Given the size and economic importance of ILG to the region, this result was expected. In terms of total airport community value, the four NPIAS airports (New Castle, Sussex County, Summit, and Delaware Airpark) round out the top four of the airports included in this analysis.

Economic Sustainability Factors scores range from 7.58 at Laurel Airport to 23.92 at New Castle Airport. These scores can be interpreted to mean that the sponsors of Laurel Airport have a significant opportunity to improve their facility and increase the future value of their investments by protecting the airport from incompatible development and attracting more business aviation. New Castle, on the other hand, is somewhat land-locked and would have difficulty expanding. New Castle's high ESF indicates that it is already highly economically sustainable. Because it is near the top of the scoring, there are fewer investment leveraging options available to the airport's sponsors because of the dense development around the airport.

ESF and Priority Ranking of Future Recommended Plan Projects

When future Economic Sustainability Factors are estimated for the Recommended Aviation System Plan airports, the numbers can be compared with existing ESF ratings to determine whether or not a net gain or loss occurs. For airports with a higher future ESF, the value of the recommendations can be said to increase above and beyond the actual dollar investments. In short, those airports with future ESF ratios that are greater than 1.0 have a net gain in Airport Community Value over airports with lower future ESF ratios.

Table 8-3 presents a comparison of existing and future ESF scores, along with the resulting ratios.

Table 8-3 – Existing and Future ESF Scores

Airport Name	Existing ESF Score	Future ESF Score	Future ESF Ratio
New Castle	23.92	23.92	1.000
Sussex County	15.44	17.62	1.141
Summit	15.14	16.05	1.060
Delaware Airpark	17.03	18.32	1.076

Table 8-3 – Existing and Future ESF Scores			
Airport Name	**Existing ESF Score**	**Future ESF Score**	**Future ESF Ratio**
Civil Air Terminal*	16.27	17.95	1.103
Chorman	10.61	11.28	1.063
Laurel	7.58	7.68	1.013

* Civilian operations only

When the future ESF ratio is applied to the capital spending at each system airport, it shows the additional value gained by the investments. For example, Sussex County Airport with a 1.141 future ESF ration is shown to receive the highest value from its capital investment program, followed by the Civil Air Terminal with a 1.103 ratio, and so on. It should be noted that many capital investments such as pavement overlays and other capital maintenance must be undertaken to keep the airport open. As such, investments at airports with low future ESF ratios cannot only be judged using this overall ratio. Also, the higher ESF scores can be used to set priorities for individual projects because the evaluation criteria consider the importance of each airport to the system.

When applying the ESF gains to the capital investment totals for each airport, there is some idea of the impact of the improvements on the overall value of each airport. The values added by the types of investments themselves, over and above the amount of actual spending, are shown in Table 8-4. The Table simply converts the percentage gains into dollars so that a comparison can be made. As shown, Sussex County has the highest percentage gain and highest absolute gain on future capital spending values of any of the system airports. Conversely, Laurel has the lowest percentage gain and the lowest absolute gain on future capital spending values. Because New Castle Airport's ESF ratio is 1.0, there is no additional future value gained beyond the Airport's capital investments themselves.

Table 8-4 – Impact of ESF on Future Capital Spending Values			
Airport Name	**Future ESF Ratio**	**Future Capital Spending**	**Added Future Value**
New Castle	1.000	$24,697,400	$0
Sussex County	1.141	$17,648,200	$2,488,400
Summit	1.060	$3,823,300	$229,400
Delaware Airpark	1.076	$24,769,500	$1,882,500
Civil Air Terminal*	1.103	$13,459,500	$1,386,300
Chorman	1.063	$4,378,500	$275,800
Laurel	1.013	$75,000	$1,000

* Civilian operations only

The following section examines individual project priorities and how they are ranked.

Individual Project Priorities

In addition to learning how to measure the greatest "bang for the buck" for future capital investment, there is a need to how individual project priorities rank among themselves. In this regard, a process was developed that helps to measure the relative value of various projects in protecting the airport investment to the community. From an economic standpoint, projects that will bring additional revenue or permit additional revenue to take place will strengthen the self-sufficiency of an airport. With a stronger revenue base, the airport has a greater chance for long-term economic survival. Thus, these projects have the potential to improve the airport's economic future and as such, the overall value of the airport to the community.

Table 8-5 presents a listing of airport projects and their rank order with regard to economic sustainability. The weighting factors for each project type are meant to show relative importance rather than absolute mathematical ranking. Thus, there is room for some debate over the scores. However, when examined on the basis of each project contributing to the business use of the airport, these fractional multipliers serve as rating factors for the project's contributing value.

Table 8-5 – Economic Sustainability Ranking of Capital Projects

Rating Factor	Capital Project
1.00	Primary Runway Length
0.95	Landside
0.92	Instrument Approach
0.90	Runway Pavement Overlay
0.88	Conventional Hangar Space
0.85	Itinerant Apron
0.85	Visual Approach Aids
0.80	Load Bearing Capacity
0.75	Jet Fuel
0.72	Taxiway Paving
0.70	Primary Runway Width
0.70	Taxiway Overlay
0.68	T-Hangar Space
0.65	Avgas
0.55	Based Aircraft Apron
0.50	Terminal Building
0.45	Apron Pavement Overlay
0.35	Auto Parking

In the overall ranking process, all of the proposed future projects are included. These projects are ranked by multiplying the rating factor for each project times the future ESF of the airport

at which the project is undertaken. Appendix 8-A presents a listing of the results of this process. As shown, there are priorities for certain groups of projects that occur in a highest-to-lowest order ranking. It should be noted that these rankings are only suggestions, but they do reflect the economic sustainability priorities for the State system.

2.2 Legislation and Regulations

In 2007, the SASPU proposed a number of recommendations for legislative changes for State laws. These included changes to the Aeronautics Code to bring various regulations in line with current practices and federal standards. In addition, proposed legislation for increasing revenue to the State to be used for the aviation system was discussed. Those recommendations have not yet been implemented. Thus, they are repeated here so as to be included in the latest State Aviation System Plan Update.

Recommendations for Changes to Existing Legislation

Many of these recommendations were made to update the law to reflect the current administrative structure and response to various responsibilities. The relevant sections include:

- § 133. Reports to federal agencies; preservation of aircraft involved in accidents.
- § 170. Operation of airport, landing area, etc. without license; approval of site required before acquisition.
- § 173. Exceptions from approval and licensing requirements.
- § 602. Erection or maintenance of obstructions; prohibitions.

Changes to Section 602 will bring Delaware into conformance with federal standards for airspace obstruction definitions contained in Federal Aviation Regulations Part 77.

Recommendations for New Legislation

Recommendations for new legislation were brought forward by the Delaware Aviation Advisory Council in accordance with their constituents' desires. In summary, these recommended changes involve the imposition of fees for aircraft registrations in Delaware and the institution of a Jet-A fuel tax of $0.05 per gallon. These new fees would generate almost $1.5 million in new revenues each year that could be applied to Delaware aviation capital needs.

2.3 Continuing Planning Process

The continuing planning process provides a means for timely updating of the Delaware Aviation System Plan. In the continuing airport system planning process, activities that the

Delaware DOT Office of Aeronautics would undertake can be grouped into five general categories:

- ***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 the level of forecast operations are tracking with actual operations.

- ***Delaware Aviation Advisory Council:*** 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 8-6. 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 8-6 - 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 2030.)
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.

Appendix 8-A:
ACV Project Priorities

Appendix 8-A

Table 8-A-1 – Economic Sustainability Ranking of Capital Projects	
Rating Factor	**Capital Project**
1.00	Primary Runway Length
0.95	Landside
0.92	Instrument Approach
0.90	Runway Pavement Overlay
0.88	Conventional Hangar Space
0.85	Itinerant Apron
0.85	Visual Approach Aids
0.80	Load Bearing Capacity
0.75	Jet Fuel
0.72	Taxiway Paving
0.70	Taxiway Overlay
0.70	Primary Runway Width
0.68	T-Hangar Space
0.65	Avgas
0.55	Based Aircraft Apron
0.50	Terminal Building
0.45	Apron Pavement Overlay
0.35	Auto Parking

Table 8-A-2 - Phase I Project Ranking			
Ranking	**Project (Airport)**	**Airport Future ESF**	**Project Rating Factor**
17.030	Runway Paving (DE Airpark)	17.03	1.00
14.476	Runway Lighting (DE Airpark)	17.03	0.85
14.476	VAGL (DE Airpark)	17.03	0.85
14.476	REIL (DE Airpark)	17.03	0.85
13.830	Apron Paving (CAT)	16.27	0.85
12.262	Taxiway Paving (DE Airpark)	17.03	0.72
11.580	T-Hangars (DE Airpark)	17.03	0.68
6.443	Approach Light Aid (Laurel)	7.58	0.85
5.961	Auto Parking (DE Airpark)	17.03	0.35
5.695	Auto Parking (CAT)	16.27	0.35
5.299	Auto Parking (Summit)	15.14	0.35

Table 8-A-3 - Phase II Project Ranking			
Ranking	**Project (Airport)**	**Airport Future ESF**	**Project Rating Factor**
15.440	Runway Paving (Sussex)	15.44	1.00
15.140	Runway Paving (Summit)	15.14	1.00
14.986	Conventional Hangars (DE Airpark)	17.03	0.88
13.124	Runway Lighting (Sussex)	15.44	0.85
12.869	Runway Lighting (Summit)	15.14	0.85
11.580	T-Hangars (DE Airpark)	17.03	0.68
11.117	Taxiway Paving (Sussex)	15.44	0.72
10.901	Taxiway Paving (Summit)	15.14	0.72
10.295	T-Hangars (Summit)	15.14	0.68
5.961	Auto Parking (DE Airpark)	17.03	0.35

Table 8-A-4 - Phase III Project Ranking			
Ranking	**Project (Airport)**	**Airport Future ESF**	**Project Rating Factor**
21.528	Runway Overlay (New Castle)	23.92	0.90
20.332	Apron Paving (New Castle)	23.92	0.85
16.744	Taxiway Overlay (New Castle)	23.92	0.70
14.318	Conventional Hangars (CAT)	16.27	0.88
13.896	Runway Overlay (Sussex)	15.44	0.90
13.626	Runway Overlay (Summit)	15.14	0.90
11.921	Taxiway Overlay (DE Airpark)	17.03	0.70
11.580	T-Hangars (DE Airpark)	17.03	0.68
11.064	T-Hangars (CAT)	16.27	0.68
10.808	Taxiway Overlay (Sussex)	15.44	0.70
10.610	Runway Paving (Chorman)	10.61	1.00
10.598	Taxiway Overlay (Summit)	15.14	0.70
10.499	T-Hangars (Sussex)	15.44	0.68
9.019	Apron Paving (Chorman)	10.61	0.85
9.019	REIL (Chorman)	10.61	0.85
9.019	Runway Lighting (Chorman)	10.61	0.85
8.135	Terminal (CAT)	16.27	0.50
7.639	Taxiway Paving (Chorman)	10.61	0.72

Table 8-A-4 - Phase III Project Ranking			
Ranking	**Project (Airport)**	**Airport Future ESF**	**Project Rating Factor**
5.961	Auto Parking (DE Airpark)	17.03	0.35
5.305	Terminal (Chorman)	10.61	0.50
5.299	Auto Parking (Summit)	15.14	0.35
3.714	Auto Parking (Chorman)	10.61	0.35