

Delaware Aviation System Plan Update

Final Technical Report



Prepared for:

Prepared by:



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Delaware Aviation System Plan: 2008 Update

Final Technical Report

Prepared for:

Delaware Department of Transportation

Prepared by:



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Chapter 1: Issues, Goals, & Objectives

ISSUES, GOALS, AND OBJECTIVES

THE PREVIOUS DELAWARE STATE AVIATION SYSTEM PLAN Update was completed in 1998, with much of the activity data coming from 1994. Since that time the aviation industry in Delaware has undergone significant changes: September 11, 2001 and associated terrorism threats, soaring avgas and jet fuel prices, proliferation of general aviation jet aircraft (large and very small jet aircraft), the purchase of Delaware Airpark by the State, and the increasing development of land near airports and throughout the State for residential housing. The Delaware State Aviation System Plan Update (SASPU) affords all interested parties in the State an opportunity to discuss these and other aviation challenges and to constructively plan for the future of aviation.

The Delaware Department of Transportation, Office of Aeronautics has initiated a two phase aviation system planning program. Phase I of the program will quantify the existing and forecast aviation needs for the State, compare the future facility needs to the existing capacity and identify bottlenecks and potential problem areas. Phase II will translate those needs into potential solutions, facilities, services, and financial support for a twenty year planning timeframe. This planning effort will incorporate current planning studies being conducted at Sussex County Airport, Summit Airport, and New Castle Airport, along with the results of a new economic impact assessment for aviation in the State.

It is anticipated that all eight public-use airports, one public-use heliport, and the Civil Air Terminal will be included in the SASPU. The study is anticipated to take between eighteen and twenty-four months to complete. This document is the first chapter prepared for inclusion in the Phase I report. Organization of the remainder of this chapter is as follows:

- State Aviation Issues
- State Aviation Goals & Objectives
- Summary

The listing and discussion of these topics does not imply that a final listing of State aviation goals, objectives, and issues has been determined. Rather, these lists can be expanded or contracted throughout the study process as new information becomes available or as a result of Aviation Advisory Committee Review.

1. STATE AVIATION ISSUES

Before the inception of the Delaware State Aviation System Plan Update, a number of issues relating to aviation were known to exist in the State. Some of these issues can readily be resolved in the system planning process. Others are outside the scope of the system planning process. These issues may not be resolved in the context of this study, however, this study can be used to lessen the effects of those issues upon the State's aviation system. An initial list of issues identified for study (in no particular order) include the following:

- Airport Security Programs
- Mitigation or Removal of Airport Airspace Obstructions
- Air Transportation Access in Central Delaware
- Economic Impacts of Aviation in Delaware
- Airline Service Outlook for Delaware Citizens
- Preservation of Available Landing Sites
- Airport/Community Land Use Compatibility
- Helicopter Landing Sites in Coastal Areas
- Coordination of SASPU with Other Transportation Planning & the Public
- Geographic Information System for Delaware Airports
- Legislative Initiatives for Aviation
- Corporate Aviation and Proliferation of Very Light Jets
- Future of Military Aviation in Delaware
- Reliable Airport Operations Counts
- Safety at Privately Owned, Private-Use Airports
- Aviation Program and Development Funding

1.1 Airport Security Programs

In light of the role that aviation played in the attacks of 9/11/2001, there is significant interest in making general aviation airports more secure. Guidelines have been published by the Transportation Security Administration for enhancing security at general aviation airports.¹ At the State level, the constant upgrading of security programs should reduce the probability of attack or likelihood of success. The statewide program developed in the SASPU will likely focus on vulnerability assessments similar to those completed for other DelDOT assets. Each airport will receive a copy of its assessment, along with training and coordination with local, state, and federal agencies. The comprehensive security plan will be coordinated with State and Federal officials associated with Homeland Security and the FAA. This security plan will likely be developed during Phase 2 of the SASPU.

1.2 Mitigation or Removal of Potential Airspace Obstructions

The Delaware Code has empowered the Department of Transportation to protect airports and their neighboring areas from potential hazardous operating conditions. This involves the removal or mitigation of existing and potential airspace obstructions to air navigation. In particular, objects that penetrate imaginary approach surfaces to airports can be hazardous to lives and property. Alternatively, obstructions can decrease the capability of the airport by increasing weather minimums. Existing regulations permit the removal of existing obstructions and empower the Office of Aeronautics with review and approval responsibilities for new building permit applications near Delaware airports. The first step toward removal of potential airspace obstructions is their identification. In this regard, the system planning database needs to identify and catalogue the

¹ Security Guidelines for General Aviation Airports, Transportation Security Administration, Information Publication A-001, May 2004.

various airspace obstructions at public-use airports in the State. For prevention, the building permit review process should preclude the erection of new airspace obstructions. The current weakness in the system is the lack of funding needed to remove existing obstructions at privately owned, public-use airports.

1.3 Air Transportation Access in Central Delaware

The original plan to provide reliable, long-term air transportation access to central Delaware was to supplement Dover Air Force Base with a publicly-owned general aviation airport. In 2000, Delaware Airpark was purchased by the State in fulfillment of that goal. As a part of the mini-system, the role of Dover AFB's Civil Air Terminal was to service large corporate jets while Delaware Airpark was to service smaller propeller general aviation aircraft. With the security concerns triggered by 9/11/2001, Dover AFB remained closed to general aviation for almost six months thereafter. As a military base, these types of security closures to general aviation can occur at any time for any perceived threat. Without civilian use of Dover AFB, uninterrupted air transportation access to central Delaware by larger corporate aircraft cannot be assured by Delaware Airpark at its present size and configuration. The aviation system plan should look at feasible solutions to this potential problem of the future.

1.4 Economic Impacts of Aviation

Accurate estimates of the economic impacts of aviation are significant to the assessment of resource allocation by local and state decision makers. When municipal projects must compete for shrinking amounts of funding, comparative estimates of the return on capital investment between projects can be important. Often the return is measured by the number of jobs, income, and total output created by the undertaking. The SASPU is a good forum for the assessment of economic impacts of aviation and the results can be quantified for easy cross-comparison to other public investment.

1.5 Airline Service Outlook for Delaware Citizens

The renewed interest in airline service in Delaware in the summer of 2006 was demonstrated by the initiation of scheduled service to New Castle Airport. The long-term success of that service is tied largely to the financial well being of the carrier itself - Delta Airlines. Assuming that Delta emerges from bankruptcy, the policy questions surrounding the service should be examined. Is airline service within Delaware acceptable when trading off any potential environmental effects against the convenience of local airline service? Prior to the Delta initiative, all Delaware citizens were required to drive to alternative airports outside the State to use scheduled airline service. Most airline passengers from Delaware use Philadelphia or Baltimore as their point of departure. If local airline service is deemed a good thing, then it should be supported by the State and its transportation policies. If local airline service is not viewed favorably, reasons for this position should be stated and no proactive support policies are needed from State government.

1.6 Preservation of Available Landing Sites

Airports are a vanishing resource, not just in Delaware, but across the nation. NASA's Small Aircraft Transportation System (SATS) research has pointed to the increased use of small airports by a greater portion of the general public. Over 98 percent of the nation's population lives within 30 minutes of a small airport. This statistic holds true in Delaware. The SATS system is anticipated to provide an alternative to road congestion and airport delays. The research being done in this program will allow new technology to be put in aircraft that will make it easier and safer to fly. Small airports will have the ability to handle more traffic than ever before. It is believed that new manufacturing techniques, engines, and technologies, will provide consumers with aircraft that have jet-like performance at very low prices.

To make such a system work, small airports and landing sites must be preserved until technology enables their efficient use. While publicly owned airports in Delaware are not under threat of closure, numerous privately owned airports face financial pressures that favor more profitable uses of the land. Faced with problems of taxation, the increasing costs of insurance, and the overall increases in the costs of flying, the privately owned airport sponsor must absorb losses each year that they occur. Once these airports are closed and converted to other uses, they cannot be reclaimed at a later time. Thus, the system plan should consider long-term planning for the future need of landing sites in Delaware.

1.7 Airport/Community Land Use Compatibility

An issue that goes hand-in-hand with airport or heliport preservation involves compatible land uses of adjacent properties. In this regard, the land use controls, zoning, and existing land uses of areas surrounding public-use airports and/or heliports will be noted in the inventory effort. Recommendations that could potentially impact surrounding land uses in a negative manner will be avoided if possible. Also, development plans for surrounding land which could adversely affect airports and/or heliports will be addressed. The upshot of this issue may be the recommendation of legislative actions that would protect both airports and their surrounding land uses from incompatible development or use.

1.8 Helicopter Landing Sites in Coastal Sussex County

Real estate values near the coastal areas in Delaware have reached an all time high. Owners of these homes have the means and desire to use helicopter services in their travel. In recent months, helicopter use of vacant property and temporary landing sites has been increasing, as quick drop-offs or pick-ups continue to occur. This trend will likely continue unless permanent "official" helicopter landing sites are identified in the area. The SASPU would examine the need for such sites and forecast that need into the 20-year future. The advantage of identifying these potential sites through the SASPU is that safety will be emphasized regarding clear approach and departure paths. In addition, land use compatibility and noise issues can be examined during this process in order to minimize the impacts on other surrounding land uses.

1.9 Coordination of SASPU with Other Transportation Planning & the Public

In order to have maximum effectiveness, the State Aviation System Plan Update should be coordinated with other transportation planning in the State and the general public. Recent emphasis upon intermodal transportation, the reduction in overall Vehicle Miles Traveled, and air/ground linkages for economic development point to the need for a well defined and coordinated plan. In this regard, the SASPU provides a forum for the aviation community and general public to be included in the overall transportation planning in the State. This process is needed in order to better define priorities in funding, project development, and policy consensus. To address this important issue, goals and objectives of the SASPU are directed toward the coordination of the plan with other ongoing transportation planning and the public. In particular, the work of the Delaware Valley Regional Planning Commission, other State agencies in Delaware, and any other relevant sources will be included in the SASPU.

1.10 Geographic Information System for Delaware Airports

Good information helps in making good decisions. DeIDOT has a significant investment in Geographic Information System (GIS) technology. Those resources have not focused on aviation infrastructure in any great detail. Because the need for GIS is increasing in every planning discipline, the aviation system in Delaware should be fully incorporated into the State's GIS. The SASPU will permit the State to develop detailed GIS data for their use. Information including facilities, leases, utilities, property lines, easements, and any other relevant data can be included in the GIS database. Administration of the aviation system can be facilitated by the use of current data that is assembled in one place. It is anticipated that DeIDOT would perform this portion of the study in-house with their own staff.

1.11 Legislative Initiatives for Aviation

It is anticipated that several legislative initiatives will be developed as a result of the SASPU. Currently, there is a need to update the language in the aviation law regarding the definition of imaginary surfaces near airports. In this regard, the State law should reflect the federal standards (Federal Aviation Regulations, Part 77). There is also a need to revise the method of funding the State aviation program. Any changes to the current method may require legislative actions - particularly if aviation fuel taxes are involved. Other legislative needs may emerge during the development of the plan which would generate other legislative proposals.

1.12 Corporate Aviation and Proliferation of Very Light Jets

Corporate aviation is an important segment of general aviation, generating disproportionately higher revenues for airport operators than smaller general aviation aircraft types. New technology used for light jets is making it possible to own and fly small jets with the safety and speed of corporate jets but at the fraction of price. These jets weigh about as much as an SUV and can land and take off on runways less than 3,000 feet in length. With the advent of very light jet aircraft, airports in Delaware with shorter runways can be used by corporate aviation. Although quieter jet

engines will be used by these small jets, there may be some concern from neighbors of smaller airports where these aircraft are used for the first time. Currently, there are seven primary manufacturers of very light jets (VLJs), including Cessna and Embraer, which are planning to roll out VLJs between this year and 2008. The FAA predicts that at least 4,500 will be in service within 10 years. Eclipse Aviation, for example, already has 2,200 orders for the new Eclipse 500. The system plan should consider the impact of these jets on airports in Delaware.

1.13 Future of Military Aviation in Delaware

Military aviation, both at New Castle Airport and Dover Air Force Base, is the single greatest economic impact of aviation in Delaware. Military aviation contributes over \$500 million to the State's economy each year and supports thousands of military and civilian jobs. The most recent Base Realignment and Closure (BRAC) committee recommendation threatened the Air National Guard Unit at New Castle Airport. Fortunately, the final plan did not include recommendations for cutbacks. However, preservation of the military mission in Delaware should be a top priority to State governmental leaders and should be addressed in the SASPU. Coordination of military aviation planning with civilian aviation planning could be enhanced through this process.

1.14 Reliable Airport Operations Counts

Reliable airport operations counts have been difficult to obtain at non-towered airports in Delaware without some type of aircraft counting devices that could be used to sample operational activity. In the past, FAA 5010 forms have been used in estimating annual aircraft operations. These numbers are actually estimates of airport managers and owners and have shown wide variations in the aircraft utilization rates at individual airports. Accurate operations counts are needed in developing forecasts, noise studies, compatible land use plans, and financial plans. Without accurate operations counts, the impacts of an airport may be misrepresented to the local community. It is believed that a program of sampling airport activity is needed. That program and methods for accurately estimating operational activity can be designed as a part of the SASPU.

1.15 Safety at Privately Owned, Private-Use Airports

In the summer of 2005, there was a tragic accident involving an aircraft and an automobile at Joseph's Airport in southern Sussex County. The airport is one of many privately owned, private-use airports in the State. It is possible that displaced threshold markings may have avoided the accident. Currently there are no State regulations covering these airports. National Transportation Safety Board representatives were interested in the possibility of State intervention at such airports that pose similar hazards. Without taking official responsibility, the State could assist these privately owned airports by examining any facilities that had runways abutting highways. If such facilities exist without displaced thresholds, the DelDOT could assist in the development of displaced runway threshold markings.

1.16 Aviation Program and Development Funding

Capital funding for airports in Delaware is provided through a variety of sources. For State funding, eligible airports have generally petitioned DelDOT for one half of the local matching grants for their federal grants. For an FAA grant of 95 percent, this translates into a 2.5 percent State match. Much of this money has come through line-item legislative requests. In addition, DelDOT has historically set aside up to \$50,000 annually to fund aviation projects at privately owned airports. Each year, there are more financial needs than budgeted resources. Compounding this problem is the potential federal change to the Airport Improvement Program formulae in FY 2008 that would double the local match from 5 to 10 percent. To keep up with these increasing funding needs, the State must develop new sources of funds that can be dedicated to the aviation system. The SASPU will examine several alternative funding streams and methods for their capture and use in the aviation system.

2. STATE AVIATION GOALS & OBJECTIVES

Once the study's issues have been identified, the goals and objectives for the state aviation system must be delineated. While the general approach and format of aviation system planning studies are well established, the ultimate success of the resulting plan depends largely on the initial planning goals and objectives. If the plan is responsive to local and regional aviation goals and objectives, its effectiveness is greatly increased. The goals selected for aviation express desired ends which relate in a technical and operational, environmental, social, or economic context to how the aviation system should develop and how it should be operated. For the purposes of this study, goals are defined as conditions to be achieved. They are derived from values and can be stated, but the degree of their achievement may not be definable. Objectives refer to specific, attainable, and measurable actions which lead to the attainment of goals. Study objectives were classified into categories that help define each of the goals.

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 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.

With these overall goals and objectives as a background, the system plan study goals and objectives can be created. The following goals and objectives represent an initial set of desired conditions to be achieved in the Delaware aviation system. They will be used throughout the study to shape policy, influence technical criteria and standards, and guide the day-to-day work efforts. In addition, these goals and objectives will provide the impetus and means to examine all of the issues identified previously.

2.1 Technical & Operational Goals & Objectives

The technical and operational goals for the aviation system would provide for the development of facilities and services in a manner consistent with and complementary to local economic and social development. As such, an initial goal for the system plan update includes the following:

Goal:

- Develop a system of airports that meets acceptable physical development standards issued by Federal, State, and local agencies, as well as aviation industry development standards.

Objectives:

- To collect all relevant data necessary to develop a system of airports and facilities that maximizes their use.
- To forecast aviation demand for the State's airports through the year 2025, adequately assessing airline, general aviation, cargo, military aviation operations, and surface access needs.
- To monitor airport operations at non-towered airports.
- To quantify existing capacity of airport airside and landside facilities for use in Phase II alternative development scenarios.
- To evaluate the role of privately owned airports and make recommendations regarding possible preservation of these landing sites for the long term to satisfy operational demands and service area voids.

- To identify any areas in the State that may need a new heliport or other aviation facility.
- To evaluate the application of multi-modal linkages to system airports.
- To develop a plan with enough flexibility to be implemented even when certain recommendations can not be executed.
- To adequately assess and plan for airport security for the State's aviation system.
- To develop a GIS database for system airports.

2.2 Environmental Goals and Objectives

Closely related to technical and operational goals are environmental goals. Ideally, airport development would occur in harmony with both the natural environment and human-affected environment. As such, goals and objectives pertaining to the environment are as follows:

Goal:

- Develop a system of airports that conforms to environmental precepts contained in the National Environmental Protection Act legislation and the revised Airport Environmental Handbook (FAA Order 5050.4B).

Objectives:

- 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.
- 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.
- Plan for an energy-efficient system of airports that provides ease of air and ground access.

2.3 Social Goals and Objectives

Appropriate social goals and objectives would provide facilities and services for all citizens in a manner that maximizes safety, efficiency, and opportunity for use. The primary goal then, is as follows:

Goal:

- Respond to the needs and desires of aviation system users and those affected by the aviation system.

Objectives:

- Plan for the orderly and timely development of the aviation system, maximizing services provided to the system users while minimizing community disruption.
- 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 the Delaware Valley Regional Planning Commission (DVRPC).
- Ensure the safety of each airport as well as the safety of the entire integrated aviation system.

2.4 Economic Goals and Objectives

Ideally, the aviation system would support local and State economic goals and plans while providing flexibility to accommodate new opportunities and shifts in development patterns. As such, economic goals and objectives include the following:

Goal:

- Enhance the opportunities for local economic development and improved employment opportunities consistent with local and State growth plans and policies.

Objectives:

- Consider the economic and financial viability of the State's aviation system and plan for potential future shortfalls in capital funding sources.
- Establish an efficient aviation system that incorporates favorable trade-offs between costs and benefits.
- Seek a developmental balance of publicly and privately-owned airports in the State, while maintaining the public's access to safe, adequate facilities.
- Provide an opportunity for a fair system of charges that distributes the burden of capital development, operation, and maintenance, equitably among the direct users and indirect beneficiaries of the system.
- Maximize Federal financial participation in the development of the aviation system.

- Encourage financial self-sufficiency for airports within the aviation system by enacting policies favorable to aviation businesses and aircraft ownership.

2.5 Internal Study Process Goals and Objectives

From the FAA's standpoint, the overall goal or purpose of the system planning study can be stated as follows:

Goal:

- To determine the type, extent, location, timing, and cost of the airport development needed in a state to establish a viable system of airports, both now and in the future. The system planning processes should result in products that can be used by the airport sponsors, State, and FAA in determining these future airport development needs.

Study process goals and objectives provide for an open forum on all aspects of aviation planning within Delaware. These goals and objectives include:

Goal:

- Coordinate the aviation planning process with other State transportation initiatives and economic development actions, and develop an awareness of the aviation planning and development process.

Objectives:

- Coordinate the SASPU process with other transportation planning initiatives and applicable economic development actions.
- Incorporate applicable findings of other study efforts in the development of the SASPU where possible.
- Provide information to all groups, agencies, and organizations concerned with aviation and the Delaware State Aviation System Plan Update.
- Ensure that Federal, State, and local officials have an opportunity to participate in the decision-making process during the development and implementation of the system plan.
- Encourage and use input and comments from the Aviation Advisory Committee via four sets of coordination meetings in order to develop a plan that can be adopted, endorsed, and implemented.

It should be noted that the goals and objectives presented here represent an initial listing and are subject to additions and revisions as other input is obtained. The study process, therefore, will remain flexible and adaptable to the specific needs of the State of Delaware.

4. SUMMARY

The issues identified earlier serve as focus points for the aviation system planning process in Delaware. The issues mainly refer to specific problem areas which were identified early in the study process. These issues must be dealt with in order to establish an effective State Aviation System for Delaware.

Goals and objectives are the essential bridge between study issues (representing the needs and desires of the local aviation interests) and the technical standards and policies set for the SASPU. In addition, goals and objectives serve to describe the aviation needs and requirements of the entire State. Without goals and objectives, the formulation of consistent policy and direction is difficult, if not impossible.

In general, the system plan is programmed to answer the following primary set of questions:

- How many public-use airports and heliports are needed in Delaware?
- Where should they be located?
- What should be each airport's function and how will its service level best respond to local aviation demand?
- How much will it cost to develop the system of airports and heliports?
- How should the development of the system be scheduled over time?

Once these basic questions are answered, a corollary set of questions must then be addressed. These include:

- Where will the funding required for development of the system be obtained and who should sponsor the development?
- What choices should be made in Kent County to serve aviation demand and public need for air transportation?
- How will the recommendations of the system plan affect the environment?
- Is it necessary to preserve landing sites in Delaware and if so, how will that be accomplished over the long term?
- What are the impacts of the aviation system on the other transportation systems within Delaware?
- How does the airport system affect the economy of Delaware?
- How should airport security be addressed by aviation stakeholders including State and local units of government as well as airport tenants and businesses.
- Are there any legislative initiatives needed as a result of the findings of the plan?
- What is the future of military aviation in Delaware and how is it integrated into long range aviation system planning?

Other decision making information will be made available to policy makers as a result of the study. It is anticipated that answers to all of the questions will come from a combination of quantitative analyses and public input and participation in the development of the study.

It cannot be overemphasized that the success of the plan hinges upon aviation community participation and acceptance of the entire process. The most highly sophisticated methodologies and quantitative techniques are of little value if the resulting recommendations are never implemented. The opportunity to participate in this process is a major part of the State Aviation System Plan Update and should be used by interested parties in Delaware to their advantage.



Chapter 2: Inventory

INVENTORY OF SYSTEM CONDITION AND PERFORMANCE

THE STATE AVIATION SYSTEM PLAN UPDATE (SASPU) process for Delaware conforms to the FAA's planning guide (Advisory Circular 150/5070-7, *The Airport System Planning Process*). As such, this chapter presents a comprehensive collection of data needed to perform the aviation system planning functions later in the analysis. This system planning effort updates the State's 1998 State Aviation System Plan.

By way of background, the 1998 SASP contained a number of recommendations that will be examined by this Update. The overall recommendation of the plan was the Expansion of Existing System alternative, where all existing airports were recommended for inclusion in the system. Recommendations from that plan indicated that every reasonable effort should be made to preserve the existing system of privately owned, public-use airports and expand them where possible. In addition, it was recommended that a new publicly owned, public-use airport be developed in Kent County. The purchase of Delaware Airpark by the State in 2000 fulfilled that recommendation. Also an optional facility to serve the coastal areas of Sussex County was included, but predicated on local support. In all, the previous system plan recommended a system of 13 facilities:

- Chandelle Estates
- Delaware Airpark
- Dover AFB/Civil Air Terminal
- Jenkins Airport
- New Castle Airport
- Summit Airport
- Optional Coastal Airport
- Chorman Airport
- DelDOT Heliport
- Henderson Airport
- Laurel Airport
- Smyrna Airport
- Sussex County Airport

Since this plan was developed, a number of changes impacting the plan have occurred. In this regard, Henderson Airport is no longer a public-use facility and thus not a part of the system plan. Delaware Airpark has been purchased by the State and is being operated by the Delaware River & Bay Authority. And finally, no local interest was generated in coastal Sussex County for the development of a new airport. Thus, the current system consists of nine public-use airports, one public-use heliport, and the Civil Air Terminal at Dover AFB.

Issues discussed in Chapter 1 apply to the current system of airports in Delaware and must be addressed in this Update. Changes from the last system plan can be noted. In particular, airport security has become a much greater issue of importance because of the ongoing terrorism threat. Funding of aviation and operations in Delaware will require more creative methods of finding and tapping sources. Airline service became a reality in Delaware in mid-summer, 2006, increasing its visibility and the issues surrounding scheduled service. Corporate aviation is on the verge of expanding into very light jets, dramatically increasing the number of jet operations and the number of airports capable of accommodating them. The tools for managing aviation in Delaware have become more computerized and DelDOT needs to use outputs from the system plan to enhance their

GIS capability for airports. While the need for an airport in coastal Delaware has not been locally expressed, there is an increased need for helicopter landing sites in that area. Many other issues from the previous system plan that have not changed significantly over time remain and will be addressed by this planning effort.

1. **PURPOSE AND NEED**

To understand the purpose and need for a State Aviation System Plan, it is helpful to consult the Federal Aviation Administration's (FAA's) Advisory Circular 150/5050-7, **The Airport System Planning Process**. That document summarizes the reasons for conducting a SASP. As stated in the Advisory Circular (AC), the main purpose of the airport system planning process is to determine the type, extent, location, timing, and cost of the airport development needed in a state or metropolitan area to establish a viable system of airports. Other purposes of the airport system planning process vary by state or metropolitan area and depend on a multitude of factors and the planning agency's commitment of resources to aeronautical activities and airport development. One key factor in the process is the nature of existing state or local laws related to aviation, because these define the planning agencies' responsibilities, authority, functions, and funding for airport activities. Other important factors include the state and regional goals and objectives regarding transportation, land use, and environmental matters.

The airport system planning process itself is an examination of system dynamics that leads to the effective use of federal, state, metropolitan, and local aviation resources in developing an efficient network of airports for current and projected needs. Airport system planning permits the study of performance and interaction of an entire aviation system to understand the interrelationship of the member airports. The process also results in the establishment of perspectives on aviation priorities, such as airport roles, funding, policy strategies, and system trends in activity level. More detailed design, and capital and environmental planning are accomplished under an individual airport's master plan.

State system planning in Delaware is accomplished within a comprehensive planning framework, consistent with state goals and objectives for economic development, transportation, land use, and the environment. It incorporates metropolitan/regional airport system planning from DVRPC and can provide direction for airport master planning. It may also serve as an important component of the FAA's National Plan of Integrated Airport Systems (NPIAS). In the context of minimal State activity, a system plan serves the purpose of defining airport development and funding requirements. This helps decision makers to plan for both State and Federal funding participation. For more active State participation, the system planning process would:

- Inform the state budgetary process with assessments of resource requirements, including timing and priorities;
- Provide the state with information to facilitate elected officials in making aviation planning and development decisions consistent with state goals and objectives, and with an airport's current Airport Layout Plan (ALP);

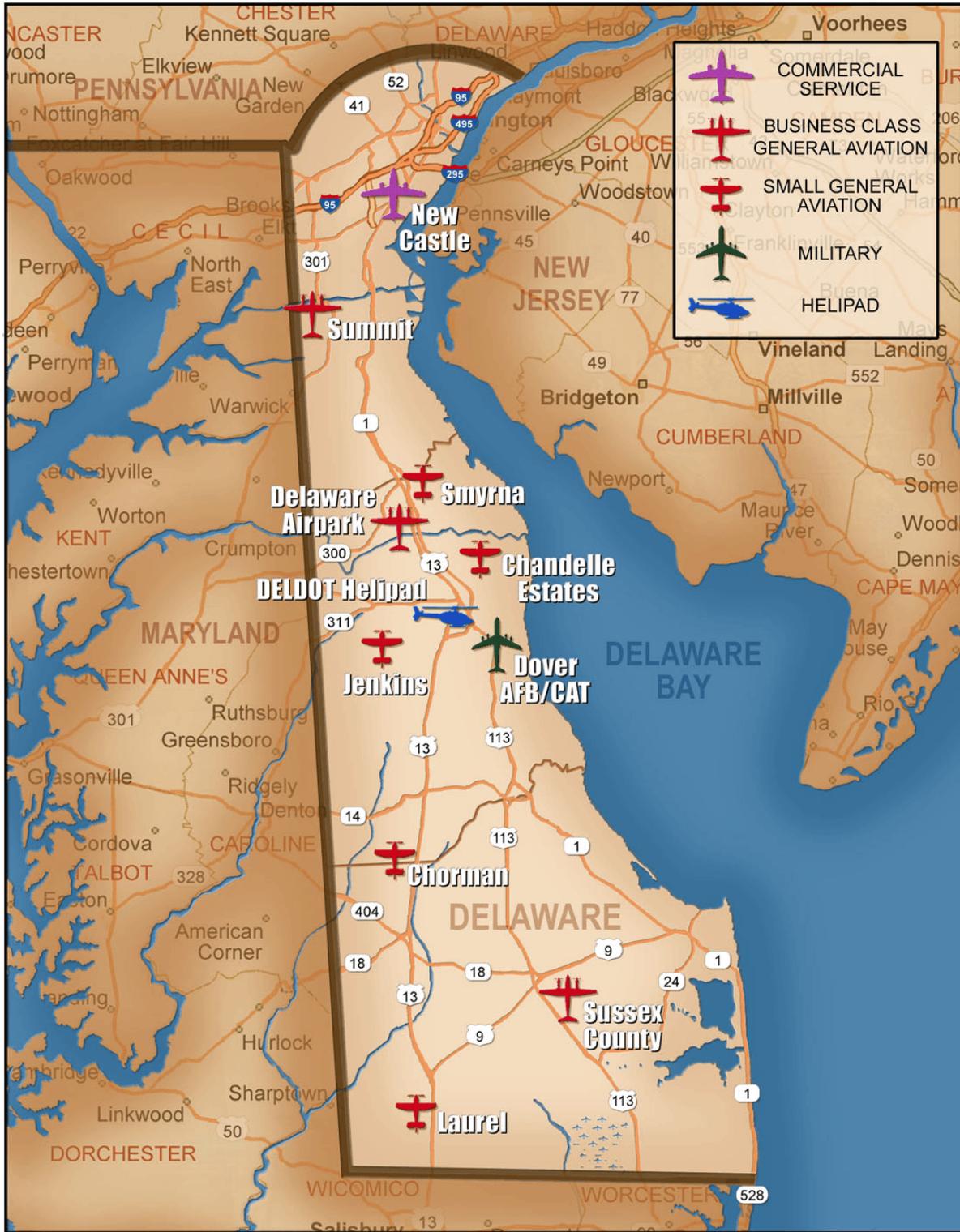
- Provide policy guidance and act as a management and coordination resource for metropolitan and multi-state planning efforts;
- Assist in coordination with other state, regional, and local planning organizations having aviation-related interests.
- Provide the FAA with recommendations for inclusion in the NPIAS;
- Contain special studies that provide the aviation community and the general public with information on pertinent airport-related issues; and
- Support a continuing airport planning process, ensuring that aviation issues are continually and effectively evaluated.

The purpose of the **Inventory of System Condition and Performance** effort is to provide the necessary database for subsequent phases of the study. Pertinent data, regarding each airport/heliport and the area it serves will be collected from the facilities themselves and appropriate State and local agencies. In addition to the data provided by these sources, the consultant will collect, tabulate, and review data published by the Federal government and other sources required for comprehensive understanding of the existing aviation system. Maximum use will be made of the existing system planning work, various existing airport master plans, and environmental studies that have been completed. From these data, the analysis of the existing system will be completed. The remainder of this chapter is organized to include the following topics:

- Airport and Heliport Facilities
- Airspace Structure and Nav aids
- Land Use and Environmental Factors
- Socioeconomic Base
- Surface Transportation Plans
- Statutes and Regulations
- Update Economic Impact of Aviation
- Summary

2. AIRPORT AND HELIPORT FACILITIES

Figure 2-1 presents a map of Delaware showing the locations of each of the existing public-use airports and heliports. For this study effort, each of the airport and heliport facilities was inspected for needed data. In addition, the facility inventory records of the FAA (Form 5010), updated as necessary, were used as another source of inventory data for airport and heliport facilities. Another source for inventory data included existing completed airport master plans, and those that are in progress. The inventory effort collected information concerning a variety of airport attributes ranging from its location and environment to its activity and condition. Special attention was given to the physical limitations of each airport for expansion.



 <p>R.A. Wiedemann & Associates, Inc. AVIATION CONSULTANTS</p>	Delaware State Aviation System Plan Update LOCATION OF PUBLIC-USE AIRPORTS AND HELIPORTS	Figure 2-1
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Data from the published records, airport master plans, and the on-site inspections provided information for each airport including but not limited to:

- **Location:** Includes city, county, and latitude/longitude.
- **Ownership:** Specifies public, private, or military ownership.
- **FAA Identifier:** Alpha numeric three-digit FAA airport code.
- **Acreage:** The physical size of the airport property.
- **Airport Role:** Includes current role as predominately small general aviation, business jet capable, airline/FAR Part 139 certificated, or military.
- **Airport Reference Code (ARC):** As described above, this further defines the role of the airport by indicating its approach speed and wingspan design category.
- **Runway Information:** Identifies runway orientation, length, width, strength, surface type (turf, asphalt, or concrete), and the condition of the surface (poor, fair, good, excellent).
- **Taxiway Information:** Identifies taxiway type (full parallel, partial parallel, stub, or none), dimensions, surface type, and condition.
- **Lighting:** Includes high, medium, and low intensity runway and taxiway lights if present.
- **Visual Landing Aids:** Includes visual approach slope indicators, precision approach path indicators, runway end identifier lights, and all types of approach light systems.
- **Instrumentation/NAVAIDS:** Describes the type of instrument approach capability at the airport, if available.
- **Fixed Base Operators:** On-airport aviation businesses.
- **Services Available:** Fuel sales, aircraft storage, maintenance, flight training, aerial application spraying, banner towing, aircraft charter/rental, or aircraft sales.
- **Weather Information:** Available either on the field through automated weather observation stations such as AWOS or ASOS, or by phone.
- **Based Aircraft:** Number of based aircraft at the airport.
- **Operations:** Operational activity by type - general aviation, military, airline.
- **Airspace:** Airspace environment at the airport (controlled or uncontrolled) including classes A, B, C, D, E or G.

Other facility-specific information was gathered during the inventory process including the number of hangars, T-hangars, apron area, terminal building space, and auto parking spaces. These measures are presented in Chapter 4 as baseline information during the capacity analysis.

The increasing availability of helicopters in the private sector, coupled with those available through government agencies (State Police, local police, U.S. Military, etc.) has created an interest in the location and use of heliports, helistops, and temporary heliport landing sites. Therefore, as part of the system plan update, the basic inventory and forecast information of helicopter and heliport data was collected and integrated into the plan. Table 2-1, presented later, shows a tabulation of public-use airport and heliport facilities within Delaware. This tabulation is an abbreviated summary of the information contained in the database file for each facility.

2.1 Airport Classifications

An Airport Reference Code (ARC) is used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The coding system 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.

Table 2-1 presents the ARC for each airport in Delaware. It should be noted that this is the existing ARC and that future plans may change that designation.

Privately owned, restricted-use airports and heliports are not included as a part of Delaware's designated airport system and are not subject to DelDOT licensing authority. Only those private airports that are open for public use are included in the analysis in order to facilitate the "systems analysis concept." Under the systems analysis concept, unrestricted transfers of based aircraft from one airport to another must be permitted. This unrestricted movement can only occur in the public-use system of airports. These public-use airports are considered the existing "network" of airports rather than the existing system of airports since updated roles for each facility have not been assigned. Once that assignment occurs, airports with system roles can be designated. Privately owned, private-use airports and heliports in Delaware are not included as network airports by definition. These facilities are listed in Appendix 2-A.

2.2 Description of Facilities

There are currently 9 public-use airports, one joint-use military air base, and one public-use heliport in Delaware. The list of facilities is as follows:

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

Table 2-1 presents a listing of the characteristics of each public-use airport in the State. As shown, there are a number of attributes associated with each facility that are described in the Table. Appendix 2-A presents a listing of all privately owned, private-use airports and heliports in Delaware. These airports and heliports were identified from the FAA's database of aviation facilities.

Table 2-1 - Delaware Public-Use Airport Data



Chandelle Estates

Fixed Base Operator:	RJR Airdrome
Services:	
<i>Fuel available:</i>	100LL MOGAS
<i>Parking:</i>	Hangars / Tie-downs
<i>Airframe service:</i>	Major
<i>Powerplant service:</i>	Major
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	24
Aircraft operations:	6,800 Annually 100% General Aviation
Airspace:	Class E



Table 2-1 - Delaware Public-Use Airport Data



Chandelle Estates

FAA Identifier:	ON4
Location:	Three miles northeast of Dover
City:	Dover
County:	Kent
Lat/Long:	N 39° 12.14' W 75° 29.13'
Ownership:	Private
Acreage:	27
Airport Role:	Small General Aviation / Open to the public.
Airport Reference Code:	Less than A-1
Runway Information:	
<i>Orientation:</i>	4-22
<i>Length:</i>	2,533'
<i>Width:</i>	28'
<i>Strength:</i>	Single-Less than 12,500 lbs.
<i>Surface:</i>	Asphalt
<i>Condition:</i>	Poor
<i>Taxiway:</i>	Turn-around
<i>Lighting:</i>	LIRL
<i>Visual Landing Aids:</i>	None
<i>Nav aids:</i>	None

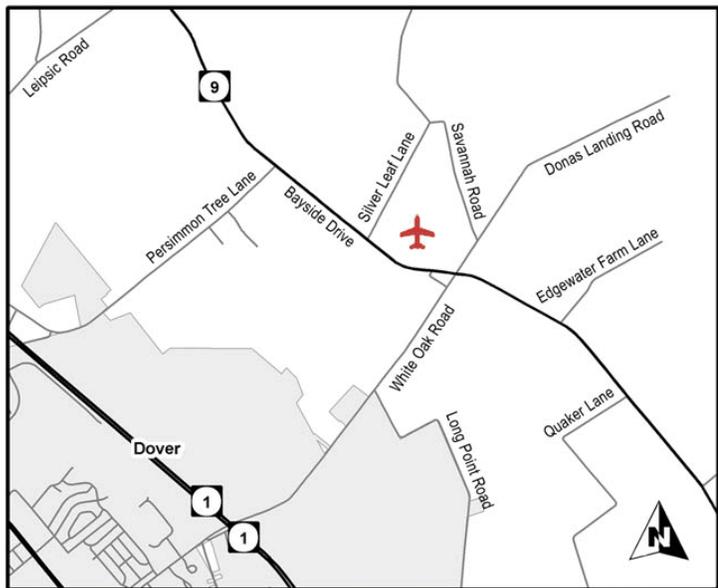
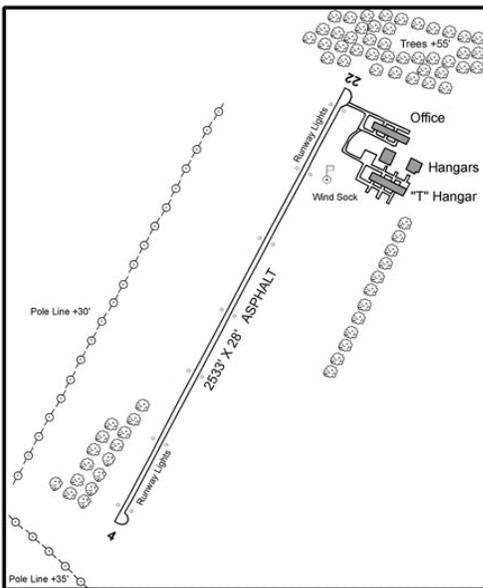
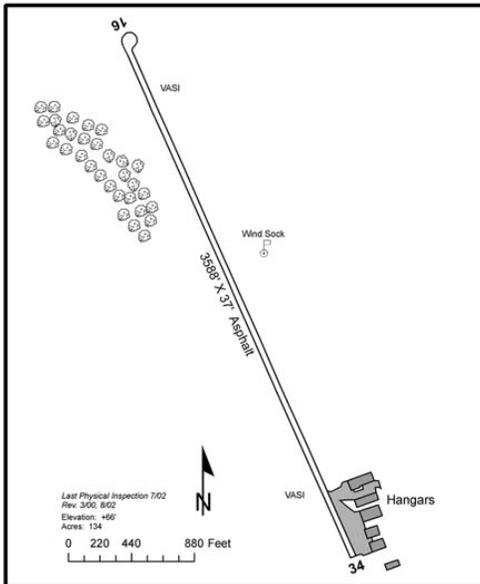
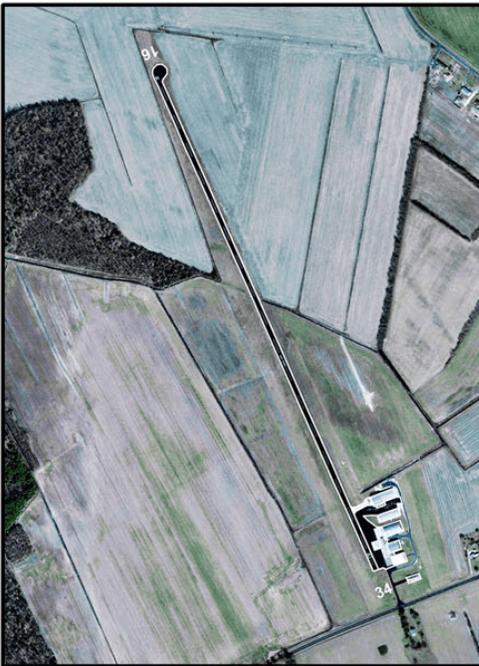


Table 2-1 - Delaware Public-Use Airport Data



Chorman	
FAA Identifier:	D74
Location:	Two miles SE of Farmington
City:	Farmington
County:	Kent
Lat/Long:	N 38 50.91' W 75 36.75'
Ownership:	Private
Acreage:	134
Airport Role:	Small General Aviation / Open to the public
Airport Reference Code:	B-I
Runway Information:	
Orientation:	16-34
Length:	3,588'
Width:	37'
Strength:	Single - Less than 12,500 lbs.
Surface:	Asphalt
Condition:	Fair
Taxiway:	None
Lighting:	LIRL
Visual Landing Aids:	TRIL
Nav aids:	None

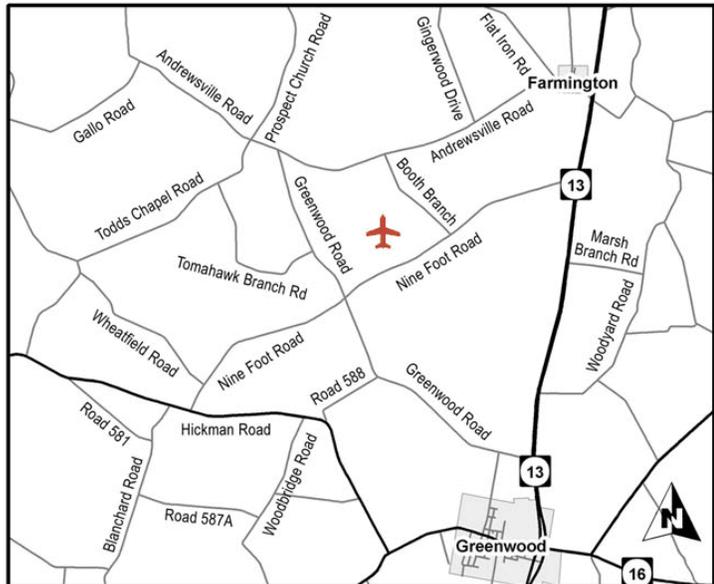


Table 2-1 - Delaware Public-Use Airport Data



Chorman

Fixed Base Operators:

Allen Chorman & Son, Inc.
 Abbott's Aero Service
 Russell Aircraft Refinishing
 Hangar 6 Aircraft Service

Services:

Fuel available: None
Parking: Hangars
Airframe service: Major
Powerplant service: Major
Bottled oxygen: None
Bulk oxygen: None

Weather Info:

Not on Airport
 FSS #856 825 8090

Based Aircraft:

19

Aircraft operations:

14,600 Annually
 100% General Aviation

Airspace:

Class E



Table 2-1 - Delaware Public-Use Airport Data



Civil Air Terminal at Dover AFB

FAA Identifier: DOV
Location: Three miles east of Dover
City: Dover
County: Kent
Lat/Long: N 39°07.77'
 W 75°27.96'
Ownership: State / Military
Acreage: 20
Airport Role: Open to limited General Aviation
 Prior permission only
(72 hours in advance)

Airport Reference Code: E-VI

Runway Information:

Orientation:	14-32	1-19
Length:	12,902'	9,601'
Width:	150'	200'

CAT Ramp Info:

Surface:	Asphalt
Condition:	Excellent
Lighting:	None

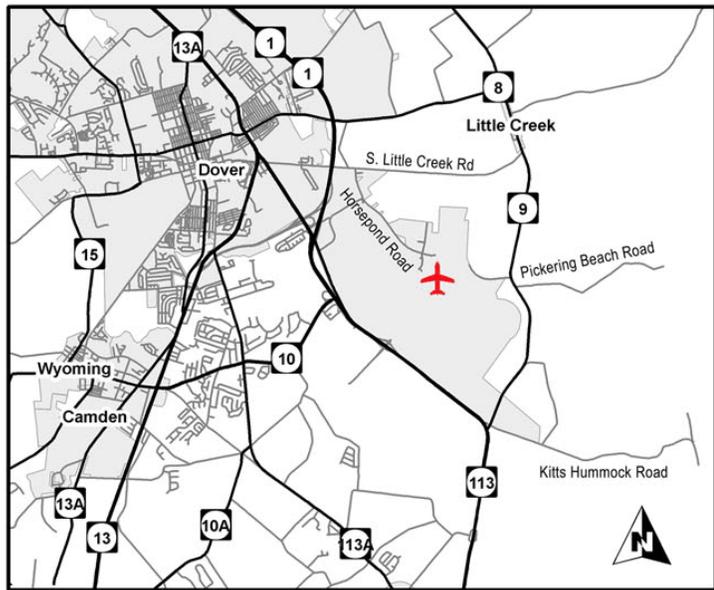
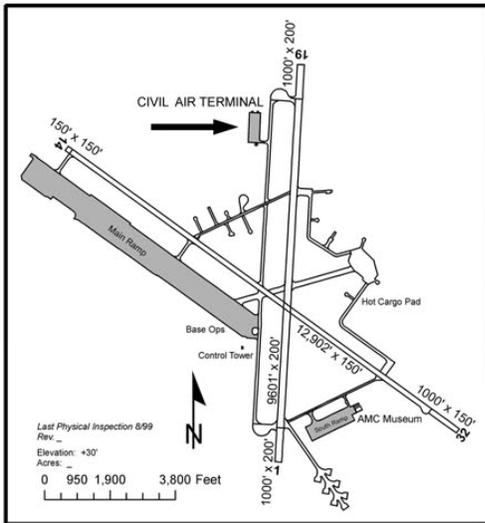


Table 2-1 - Delaware Public-Use Airport Data

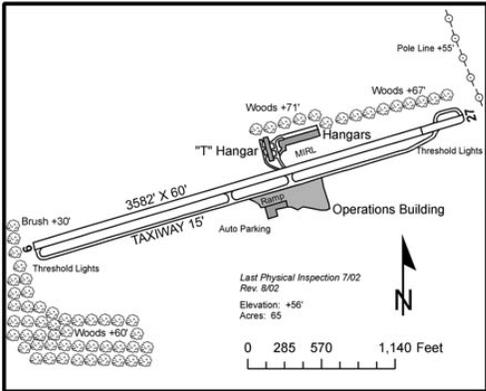


Civil Air Terminal at Dover AFB

Fixed Base Operator:	Delaware River & Bay Authority
Services:	
<i>Fuel available:</i>	With advanced notice
<i>Parking:</i>	Ramp
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	None
Aircraft operations:	124,660 Annually: 660 General Aviation 124,000 Military
Airspace:	Class D



Table 2-1 - Delaware Public-Use Airport Data



Delaware Airpark

FAA Identifier: 33N
Location: One mile west of Cheswold
City: Cheswold
County: Kent
Lat/Long: N 39° 13.10'
 W 75° 35.79'

Ownership: Public
Acreage: 65
Airport Role: Medium General Aviation
 Open to the public

Airport Reference Code: B-I

Runway Information:
Orientation: 9-27
Length: 3,582'
Width: 60'
Strength: Single 13,000 lbs.
 Dual 18,000 lbs.
Surface: Asphalt
Condition: Excellent
Taxiway: Full Parallel
Lighting: MRL
Visual Landing Aids: None
Nav aids: VOR, GPS

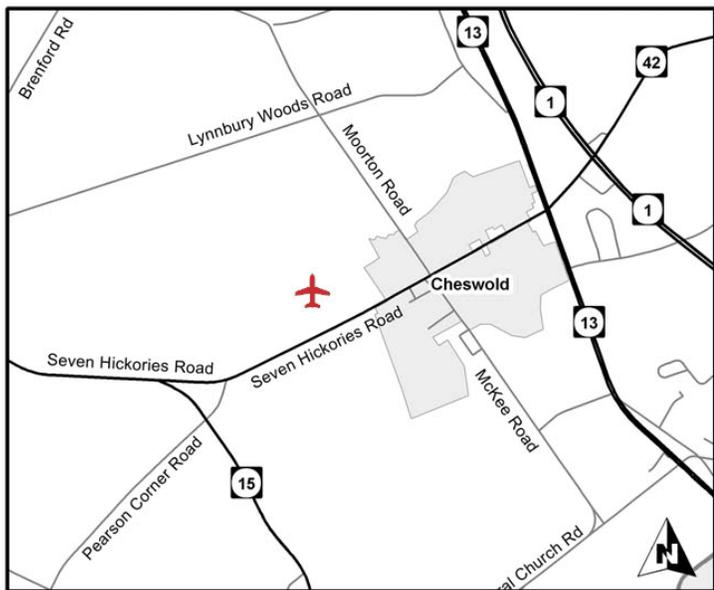


Table 2-1 - Delaware Public-Use Airport Data



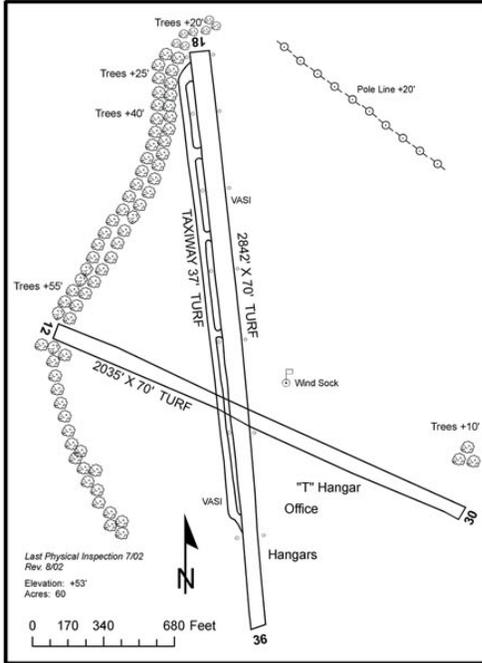
Delaware Airpark



Fixed Base Operator:	Delaware River & Bay Authority
Services:	
<i>Fuel available:</i>	100LL / 24 hour self-service credit card fuel available
<i>Parking:</i>	Hangars and Tie-downs
<i>Airframe service:</i>	None
<i>Powerplant service:</i>	None
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	44
Aircraft operations:	36,000 Annually 100% General Aviation
Airspace:	Class E



Table 2-1 - Delaware Public-Use Airport Data



Jenkins

FAA Identifier:	15N
Location:	One mile west of Wyoming
City:	Wyoming
County:	Kent
Lat/Long:	N 39° 07.17' W 75° 35.03'
Ownership:	Private
Acreage:	60
Airport Role:	Small General Aviation / Open to the public
Airport Reference Code:	Less Than A-I
Runway Information:	
<i>Orientation:</i>	18-36 12-30
<i>Length:</i>	2,842' 2,035'
<i>Width:</i>	70' 70'
<i>Strength:</i>	NA NA
<i>Surface:</i>	Turf Turf
<i>Condition:</i>	Good Good
<i>Lighting:</i>	LIRL None
<i>Visual Landing Aids:</i>	None
<i>Nav aids:</i>	None

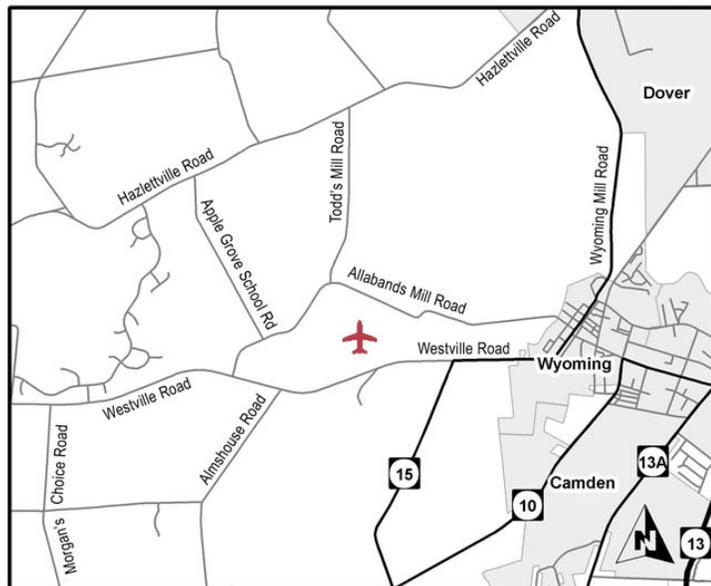


Table 2-1 - Delaware Public-Use Airport Data

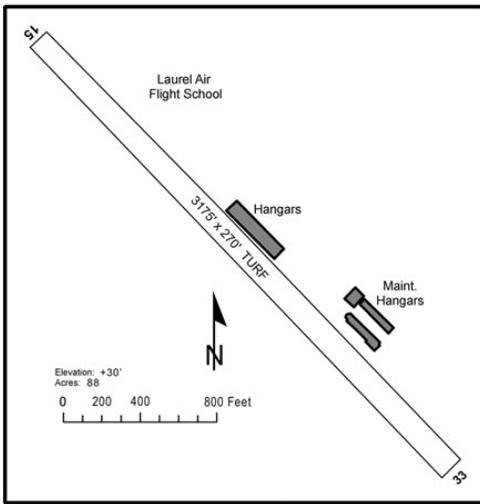


Jenkins

Fixed Base Operator:	Joe C. Jenkins
Services:	
<i>Fuel available:</i>	None
<i>Parking:</i>	Hangars / Tie-downs
<i>Airframe service:</i>	Major
<i>Powerplant service:</i>	Major
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	19
Aircraft operations:	2,500 Annually 100% General Aviation
Airspace:	Class E



Table 2-1 - Delaware Public-Use Airport Data



Laurel

FAA Identifier: N06
Location: One mile southwest of Laurel
City: Laurel
County: Sussex
Lat/Long: N 38°32.50'
 W 75°35.63'

Ownership: Private
Acreeage: 88
Airport Role: Small General Aviation / Open to the public

Airport Reference Code: Less Than A-I

Runway Information:
Orientation: 15-33
Length: 3,175'
Width: 270'
Strength: NA
Surface: Turf
Condition: NA
Taxiway: None
Lighting: LIRL
Visual Landing Aids: 33-REIL
Nav aids: GPS

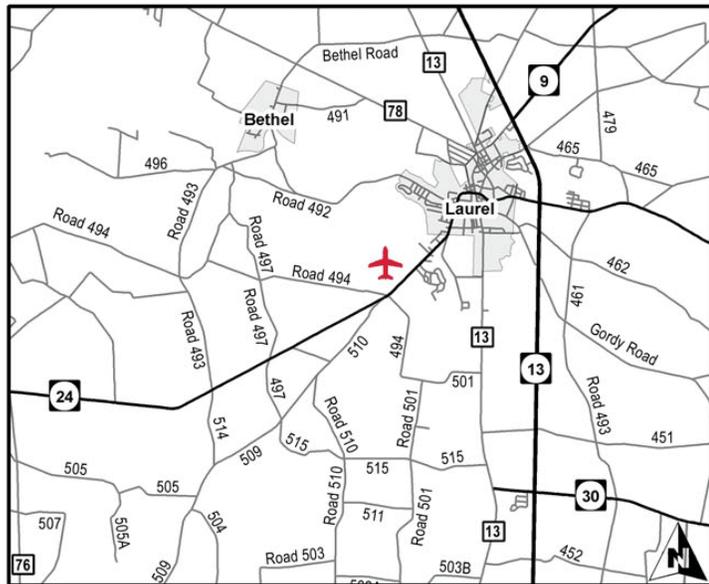


Table 2-1 - Delaware Public-Use Airport Data



Laurel

Fixed Base Operators:

Air Ag, Inc.
 Sky Dive DelMarVa, Inc.
 Aircraft Insp. & Maintenance

Services:

Fuel available: None
Parking: Hangars and Tie-downs
Airframe service: Major
Powerplant service: Major
Bottled oxygen: None
Bulk oxygen: None

Weather Info:

Not on Airport
 FSS #856 825 8090

Based Aircraft:

14

Aircraft operations:

7,750 Annually
 100% General Aviation

Airspace:

Class E

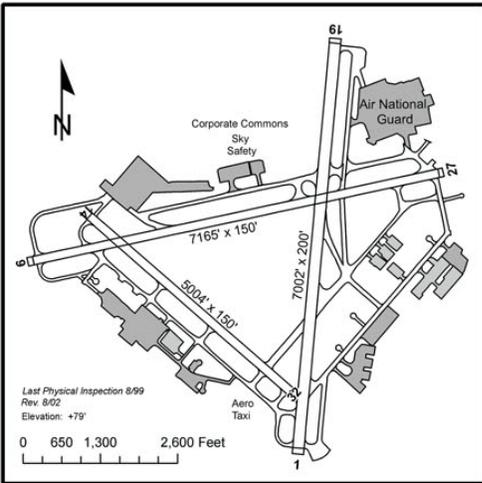


Table 2-1 - Delaware Public-Use Airport Data



New Castle

FAA Identifier: ILG
Location: Four miles south of Wilmington
City: Wilmington
County: New Castle
Lat/Long: N 39° 40.72'
W 75° 36.39'
Ownership: Public
Acreage: 1,250
Airport Role: Commercial Service / Open to the public



Airport Reference Code: D-III
Runway Information:

Orientation:	9-27	1-19	14-32
Length:	7,181'	7,002'	5,004'
Width:	150'	200'	150'
Strength:	Single	Single	Single
	90,000	90,000	50,000
	Dual	Dual	Dual
	140,000	140,000	60,000
Surface:	Asphalt	Asphalt	Asphalt
Condition:	Fair	Fair	Fair
Taxiway:	Full Par.	Part Par.	Full Par.
Lighting:	HIRL	HIRL	MIRL
Visual Landing Aids:	9-PAPI / 27-VASI / 01-SSALR 19-REIL, VASI / 32-VASI		
Nav aids:	ILS, MLS, VOR, GPS		

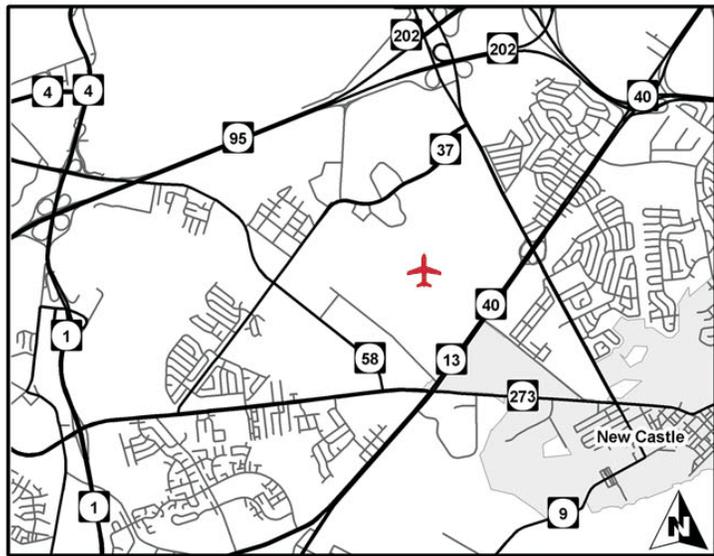


Table 2-1 - Delaware Public-Use Airport Data



New Castle

Fixed Base Operators:

Aero Taxi Inc.
 Dassault Falcon Jet
 AvCenter-Wilmington

Services:

Fuel available: 100LL JET-A
Parking: Hangars and Tiedowns
Airframe service: Major
Powerplant service: Major
Bottled oxygen: High/Low
Bulk oxygen: High/Low

Weather Info:

ASOS (302) 328-1536

Based Aircraft:

257

Aircraft Operations:

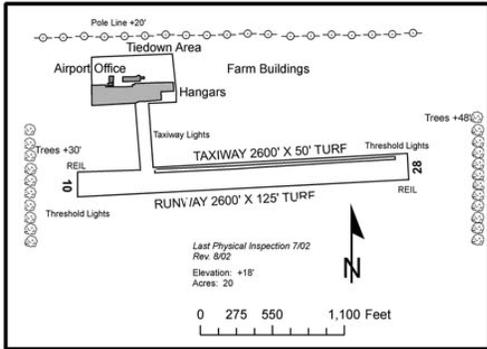
134,112 Annually:
 123,500 General Aviation
 10,612 Military

Airspace:

Class D



Table 2-1 - Delaware Public-Use Airport Data



Smyrna

FAA Identifier:	38N
Location:	One mile east of Smyrna
City:	Smyrna
County:	Kent
Lat/Long:	N 39° 18.01' W 75° 35.23'
Ownership:	Private
Acreage:	20
Airport Role:	Small General Aviation / Open to the public
Airport Reference Code:	Less Than A-I
Runway Information:	
<i>Orientation:</i>	10-28
<i>Length:</i>	2,600'
<i>Width:</i>	125'
<i>Strength:</i>	NA
<i>Surface:</i>	Turf
<i>Condition:</i>	Good
<i>Lighting:</i>	LIRL
<i>Visual Landing Aids:</i>	10-REIL. TRCV (TRIL) 28-REIL. TRCV (TRIL)
<i>Nav aids:</i>	None

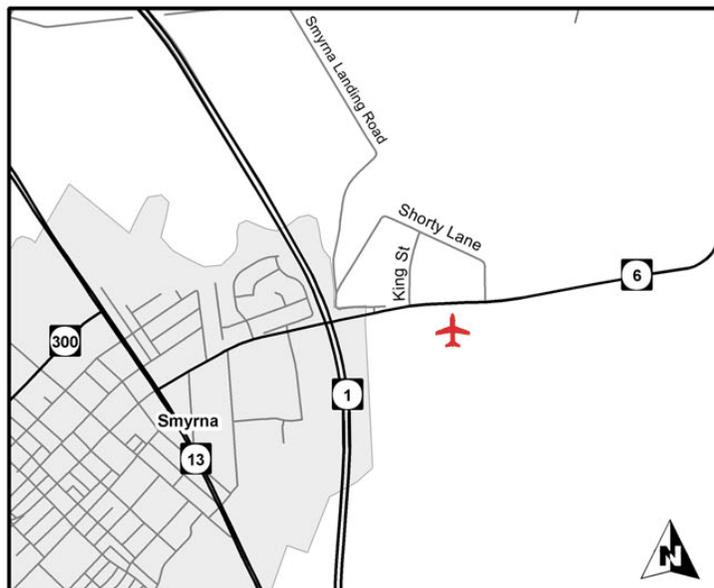


Table 2-1 - Delaware Public-Use Airport Data

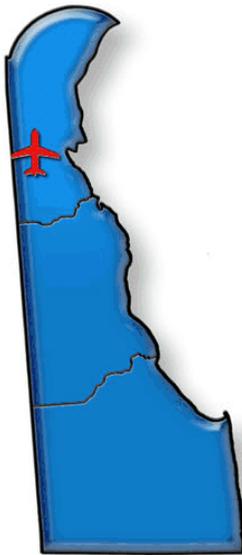


Smyrna

Fixed Base Operator:	Reynolds L. Jones
Services:	
<i>Fuel available:</i>	100LL MOGAS
<i>Parking:</i>	Hangars / Tie-downs
<i>Airframe service:</i>	None
<i>Powerplant service:</i>	None
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	6
Aircraft operations:	2,300 Annually 100% Local General Aviation
Airspace:	Class E



Table 2-1 - Delaware Public-Use Airport Data



Summit

Fixed Base

Operator:

Summit Aviation Inc

Services:

Fuel available: 100LL JET-A
Parking: Hangars and Tie-downs
Airframe service: Major
Powerplant service: Major
Bottled oxygen: None
Bulk oxygen: Low

Weather Info:

AWOS-3 132.325
(302) 378-2063

Based Aircraft:

76

Aircraft operations:

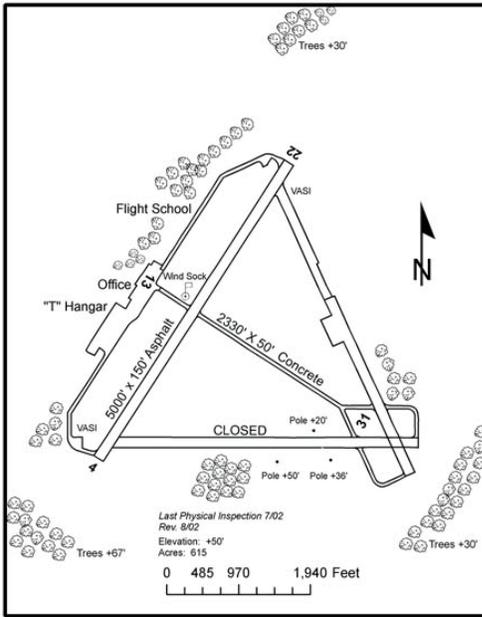
65,500 Annually:
65,400 General Aviation
100 Military

Airspace:

Class E



Table 2-1 - Delaware Public-Use Airport Data



Sussex County

FAA Identifier:	GED	
Location:	Two miles S.E. of Georgetown	
City:	Georgetown	
County:	Sussex	
Lat/Long:	N 38° 41.35' W 75° 21.54'	
Ownership:	Public	
Acreage:	615	
Airport Role:	General Aviation / Open to the Public	
Airport Reference Code:	B-III	
Runway Information:		
<i>Orientation:</i>	4-22	13-31
<i>Length:</i>	5,000'	2,330'
<i>Width:</i>	150'	50'
<i>Strength:</i>	Dual 70,000 lbs.	Dual 70,000 lbs.
<i>Surface:</i>	Asphalt	Concrete
<i>Condition:</i>	Good	Fair
<i>Taxiway:</i>	Full Parallel	None
<i>Lighting:</i>	MIRL	MIRL
<i>Visual Landing Aids:</i>	4-REIL / VASI, 22-REIL / VASI	
<i>Nav aids:</i>	VOR, RNAV	

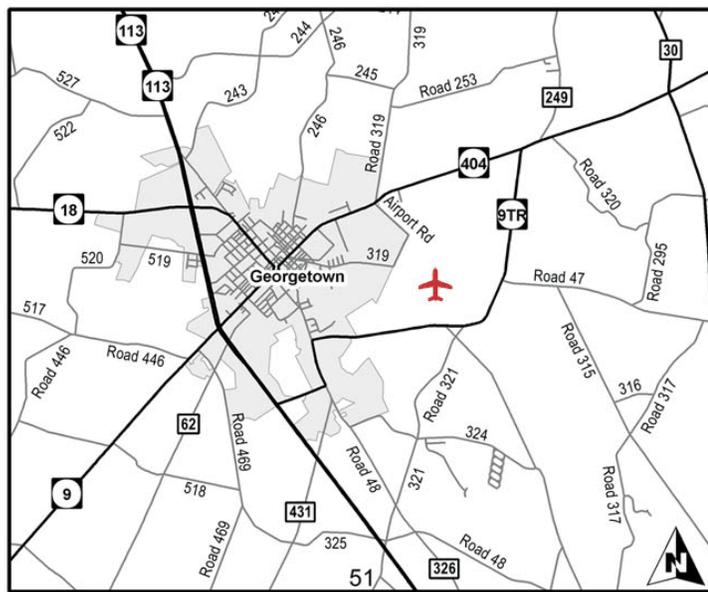


Table 2-1 - Delaware Public-Use Airport Data



Sussex County

Fixed Base Operator:	Georgetown Air Services
Services:	
<i>Fuel available:</i>	100LL JET-A
<i>Parking:</i>	Hangars and Tiedowns
<i>Airframe service:</i>	Major
<i>Powerplant service:</i>	Major
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	AWOS 118.375 (302) 856-2927
Based Aircraft:	47
Aircraft operations:	45,600 Annually: 44,400 General Aviation 1,200 Military
Airspace:	Class E



Table 2-1 - Delaware Public-Use Airport Data



DELDOT Helistop

FAA Identifier:	0N5
Location:	On the Delaware Department of Transportation campus in Dover
City:	Dover
County:	Kent
Lat/Long:	N 39° 08.97' W 75° 30.30'
Ownership:	Public
Acreage:	1
Airport Role:	General Aviation / Open to the public
Airport Reference Code:	None
<i>Orientation:</i>	NA
<i>Length:</i>	60'
<i>Width:</i>	60'
<i>Surface:</i>	Asphalt
<i>Condition:</i>	Good
<i>Taxiway:</i>	NA
<i>Lighting:</i>	Perimeter Lights
<i>Visual Landing Aids:</i>	None
<i>Nav aids:</i>	None



Table 2-1 - Delaware Public-Use Airport Data



DELDOT Helistop

Fixed Base Operator:	DeIDOT
Services:	
<i>Fuel available:</i>	None
<i>Parking:</i>	None
<i>Airframe service:</i>	None
<i>Powerplant service:</i>	None
<i>Bottled oxygen:</i>	None
<i>Bulk oxygen:</i>	None
Weather Info:	Not on Airport FSS #856 825 8090
Based Aircraft:	None
Aircraft operations:	30
Airspace:	Class E



2.3 Aeronautical Activity

The past and present development of air traffic volumes at the existing public-use airports in the State were reviewed to establish a basis for forecasting future aeronautical activity. The categories of air traffic activity collected and studied included:

- General Aviation
 - Registered aircraft
 - Based aircraft
 - Fleet mix
 - Aircraft operations and peaking characteristics
- Military
 - Total aircraft operations at system airports

The primary source for aircraft activity information at the outset of the planning effort was airport management records, Air Traffic Control Tower (ATCT) records, FAA Form 5010 data, or recent airport master plans. Historical information used to develop the registered aircraft forecast is based on data compiled by private vendors (Avantext, Hi-Tech Marketing) for the years 1995-2005 and by the FAA published in their **Census of U.S. Civil Aircraft** (1990-1994).

Data regarding military aviation operations was collected from Dover AFB, New Castle Airport, and Sussex County Airport. In addition, Summit Airport has a small number of military operations each year. Activity in the State consists mostly of Dover traffic, with additional weekend training and transport operations conducted by the Air National Guard. The level of operations is a function of Department of Defense policy and Congressional funding.

Table 2-2 presents a summary of aircraft activity for all categories. As shown, general aviation activity for 2005 totaled 291,830 operations. Military operations totaled 135,924, with Dover AFB showing the major share of activity. The top three airports in the State with regard to based aircraft are: New Castle County (257), Summit (76) and Sussex County (47).

Table 2-2 - Airport Activity Summary			
AIRPORT	ANNUAL OPERATIONS		BASED AIRCRAFT
	General Aviation	Military	
Chandelle Estates	6,800	0	24
Chorman Airport	14,600	0	19
Civil Air Terminal at Dover AFB ¹	660	124,000	0
Delaware Airpark	36,000	0	44
Jenkins Airport	2,500	0	19
Laurel Airport	7,750	0	14
New Castle Airport	123,500	10,612	257

Table 2-2 - Airport Activity Summary			
AIRPORT	ANNUAL OPERATIONS		BASED AIRCRAFT
	General Aviation	Military	
Smyrna Airport	2,300	0	6
Summit Airport	65,400	100	76
Sussex County Airport	44,400	1,200	47
DELDOT Helistop	20	12	0
GRAND TOTALS	407,580	146,536	749

¹ Joint-use facility with State-owned civil facilities.

3. AIRSPACE STRUCTURE AND NAVAIDS

An analysis of current air traffic flows for civil and military air traffic throughout the State was made as a part of this data collection effort. Data developed included current airspace use patterns and traffic flows and potential points of conflict in airspace use and their effects on existing airport capacities. From data developed in this analysis, airspace criteria will be developed for planning the recommended system of airports.

In addition, an evaluation was conducted of all existing electronic navigation aids including Global Positioning System (GPS) approaches, Instrument Landing Systems (ILS), localizers, very high frequency omni-directional range (VOR), and non-directional radio beacons (NDB). These instrument approaches are used to improve flight safety and provide improved all-weather capability for airports within the state.

In addition to the physical airspace and instrumentation, an examination was made of the existing pilot-to-ground voice communications availability and local airport communications capability including commercially operated stations such as AIRINC and locally-owned UNICOM frequencies. Specific attention was given to the frequency of the transmitter and airport operating hours which restrict pilot communications with the airport or heliport.

3.1 Airspace Structure

This section examines the types of airspace that impact aircraft operations in Delaware. This information will be referenced in later phases of the system plan to identify Delaware airports' relation to the operational terminal and enroute airspace system in the region.

Airspace structure is classified as Uncontrolled, Controlled, Special Use, or Other. Uncontrolled Airspace is defined as all airspace that has not been designated as Controlled and within which, Air Traffic Control (ATC) has neither the authority nor responsibility for control. Controlled Airspace, on the other hand, is supported by ground/air communications, navigation aids, and air traffic services. The specific FAA airspace classifications are listed below:

Controlled Airspace

There are five classes of Controlled airspace as shown in Figure 2-2:

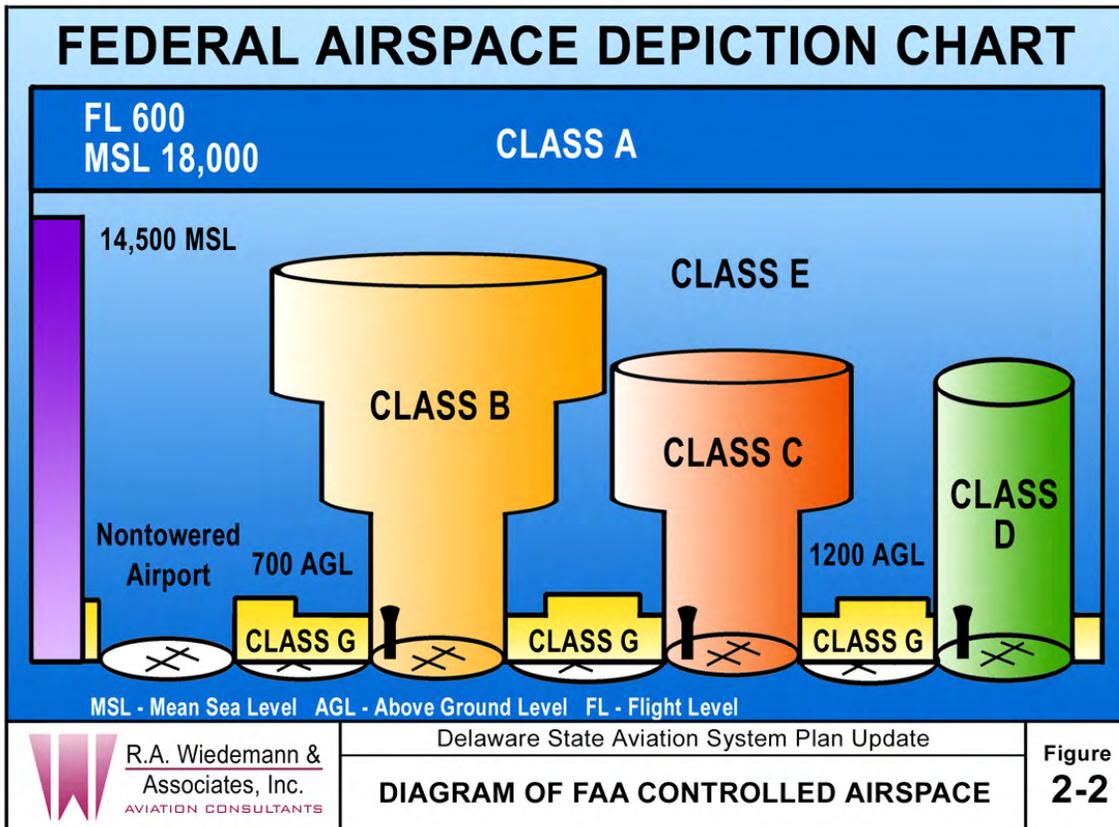
- Class A: All airspace above 18,000 feet mean sea level (MSL).
- Class B: An area with a 20 Nautical Mile (NM) radius around the nations busiest commercial airports. Philadelphia International, Washington National, Dulles, and Baltimore/Washington International Airports have Class B airspace.
- Class C: An area with a 10 NM radius around busy commercial airports. No Delaware airports have Class C airspace.
- Class D: An area with a 5 NM radius (or larger) around moderate activity commercial and military airports. New Castle Airport and Dover AFB have Class D airspace.
- Class E: General/enroute controlled airspace beginning 700 feet Above Ground Level (AGL), or 1,200 feet AGL and extending upward to the overlying Class A area.

There are a number of factors pertaining to Controlled airspace that impact pilots flying through Delaware airspace. First, regardless of weather conditions, ATC authorization is required prior to operating within the Class B airspace over the Wilmington area. Pilots should not request such authorization unless the following requirements are met:

- The aircraft is equipped with a two-way radio capable of communicating with ATC on appropriate frequencies along with an appropriate transponder.
- The pilot has a private pilot certificate or better in order to land or takeoff from an airport within Class B areas.

Further, it should be noted that large turbine engine powered airplanes operating to or from a primary airport must operate at or above the designated floors while within the lateral limits of the Class B airspace. Smaller aircraft can "fly under" the Class B area floors but are cautioned against flying too close to Class B area boundaries, especially where the floor of the Class B area is 3,000 feet or less or where normal VFR cruise altitudes are at or near the floor of higher levels.

In addition to these restrictions, all aircraft operating at or above 10,000 feet (MSL), or within 30 miles of a Class B airspace primary airport, or within and above all Class C airspace up to 10,000 feet MSL, or within 10 miles of certain designated airports, need to be equipped with Mode C transponders. These devices automatically report to ATC the location and altitude of an aircraft.



Uncontrolled Airspace

- Class G: Uncontrolled airspace from the surface to 700 feet AGL, or 1,200 feet AGL surrounding Delaware's airports.

Special Use Airspace

This airspace category consists of that airspace wherein activities must be confined because of their nature, or wherein limitations are imposed upon aircraft operations that are not a part of those activities, or both. Special Use airspace includes: Prohibited Areas, Restricted Areas, Warning Areas, Military Operations Areas, Alert Areas, and Controlled Firing Areas. Currently, there are no Special Use airspace areas in Delaware, according to the most recent Washington Sectional Aeronautical Chart. It should be noted, however, that there is extensive military training activity using Lockheed Galaxy C5's and other large military transport aircraft at Dover AFB.

Other Airspace Areas

Other Airspace Areas include: Airport Advisory Areas, Military Training Routes, Temporary Flight Restrictions, Flight Limitations/Prohibitions, Parachute Jump Aircraft Operations, Published VFR Routes, and Terminal Radar Service Areas (TRSA). In Delaware, there are several of these airspace areas published on aeronautical charts (see Figure 2-3).



 <p>R.A. Wiedemann & Associates, Inc. AVIATION CONSULTANTS</p>	<p>Delaware State Aviation System Plan Update</p> <p>DELAWARE AERONAUTICAL CHART</p>	<p>Figure 2-3</p>
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3.2 Enroute Airspace System

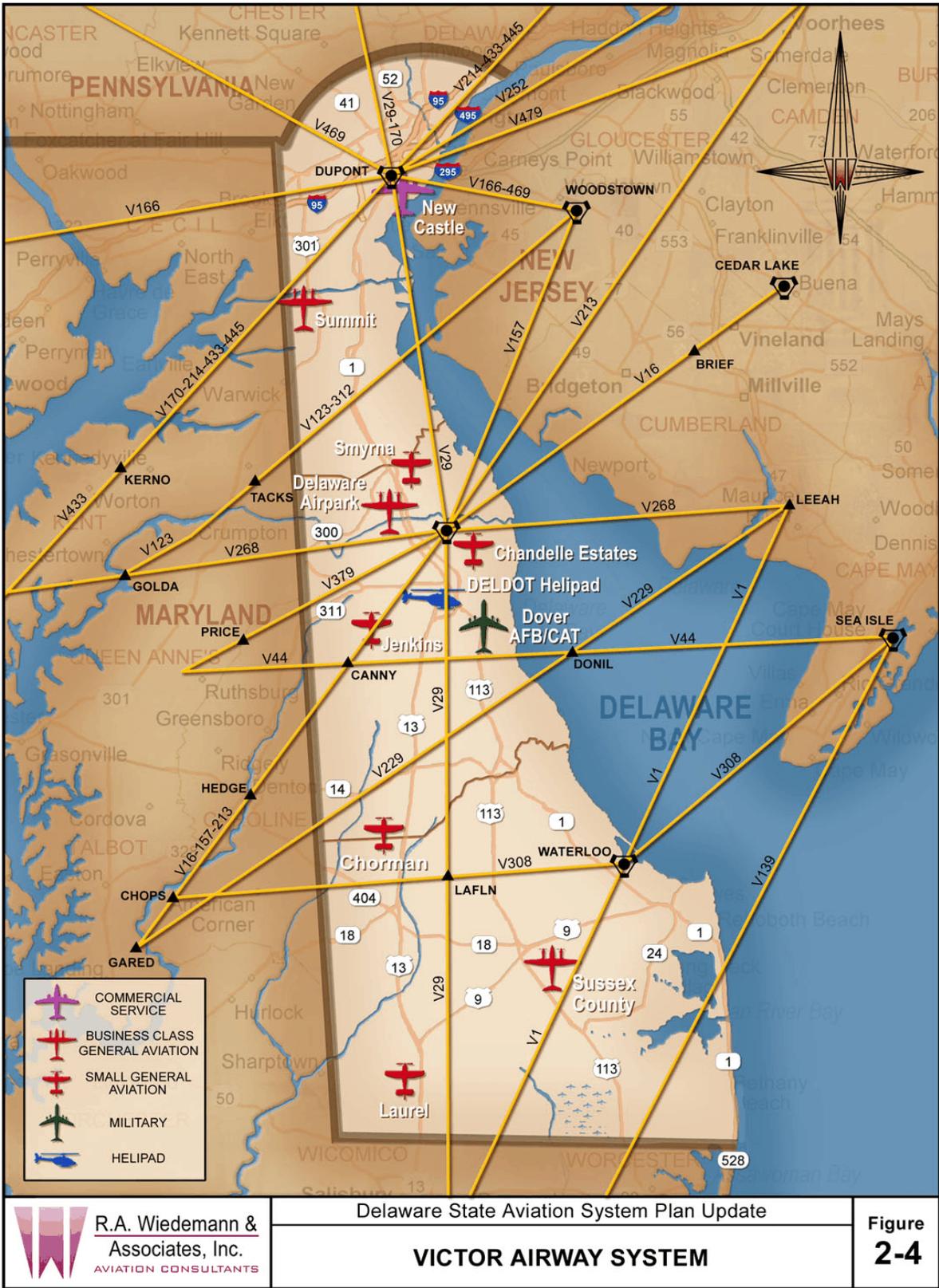
The Enroute Airspace System is composed of a network of three airway or route systems. These are the very high frequency omnidirectional range (VOR), jet route, and fixed area navigation (RNAV) route systems. The procedures pilots employ in the en route phase of flight take place in the structure of the National Airspace System (NAS) consisting of three strata. The first, or lower stratum, is an airway structure that extends from the base of controlled airspace up to but not including 18,000 feet mean sea level (MSL). The second stratum is an area containing identifiable jet routes as opposed to designated airways, and extends from 18,000 feet MSL to Flight Level (FL) 450 (45,000 feet MSL). The third stratum, FL 450 and above is intended for random, point-to-point navigation.

Although the jet route and area navigation routes are part of the airspace system, they will not directly interact with airports in Delaware. Therefore, these routes were not considered in the airspace analysis. Attention was focused on the first stratum, low altitude airway system that would directly affect operations at Delaware airports.

The low altitude VOR airways are included as a special kind of Class E airspace. The VOR airways are predicated solely on VOR/VORTAC navigation aids and are depicted on Enroute Low Altitude Charts and Sectional Charts by a "V" ("Victor") followed by the airway number, such as V 403. These airways are numbered similarly to U.S. highways. As in the highway numbering system, a segment of an airway which is common to two or more routes carries the numbers of all the airways which coincide for that segment. The airspace set aside for a Victor Airway is eight miles wide. They are designated from 1,200 feet above the surface (or in some cases higher) up to but not including 18,000 feet MSL. Figure 2-4 depicts the Victor Airways as they exist in Delaware.

With the advent of GPS technology, many aircraft are equipped with navigation equipment that permits them to fly directly to and from their destinations without having to use the VOR airways. "Free Flight" has been defined as a safe and efficient flight operating capability under instrument flight rules (IFR) in which the operators have the freedom to select their path and speed in real time. Air traffic restrictions are only imposed to ensure separation, to preclude exceeding airport capacity, to prevent unauthorized flight through Special Use Airspace (SUA), and to ensure safety of flight. Restrictions are limited in extent and duration to correct the identified problem. Any activity which removes restrictions represents a move toward free flight.¹ It is unlikely that the Victor airways system will be replaced with free flight in the near future. However, the intermediate and long term future will likely see technology improvements that will change the airway charts which now depict the VOR airway system in Delaware.

¹ Source: NASA's Free Flight Air Traffic Management Research, Advanced Air Transportation Technologies, May, 2000.



3.3 Terminal Airspace System

The terminal airspace system is composed of all facilities, equipment, and personnel in the near-airport area required to safely transition an aircraft from enroute to terminal area flight and subsequent airport landing. The essential elements of the terminal ATC system include: airports, flight service stations, airport control towers, electronic navaids, airport lighting aids, and instrument approach lighting systems. Two aspects of terminal airspace that impact the development of this system plan study include:

- Instrument Flight Rule (IFR) Terminal Airspace
- Visual Flight Rule (VFR) Terminal Airspace

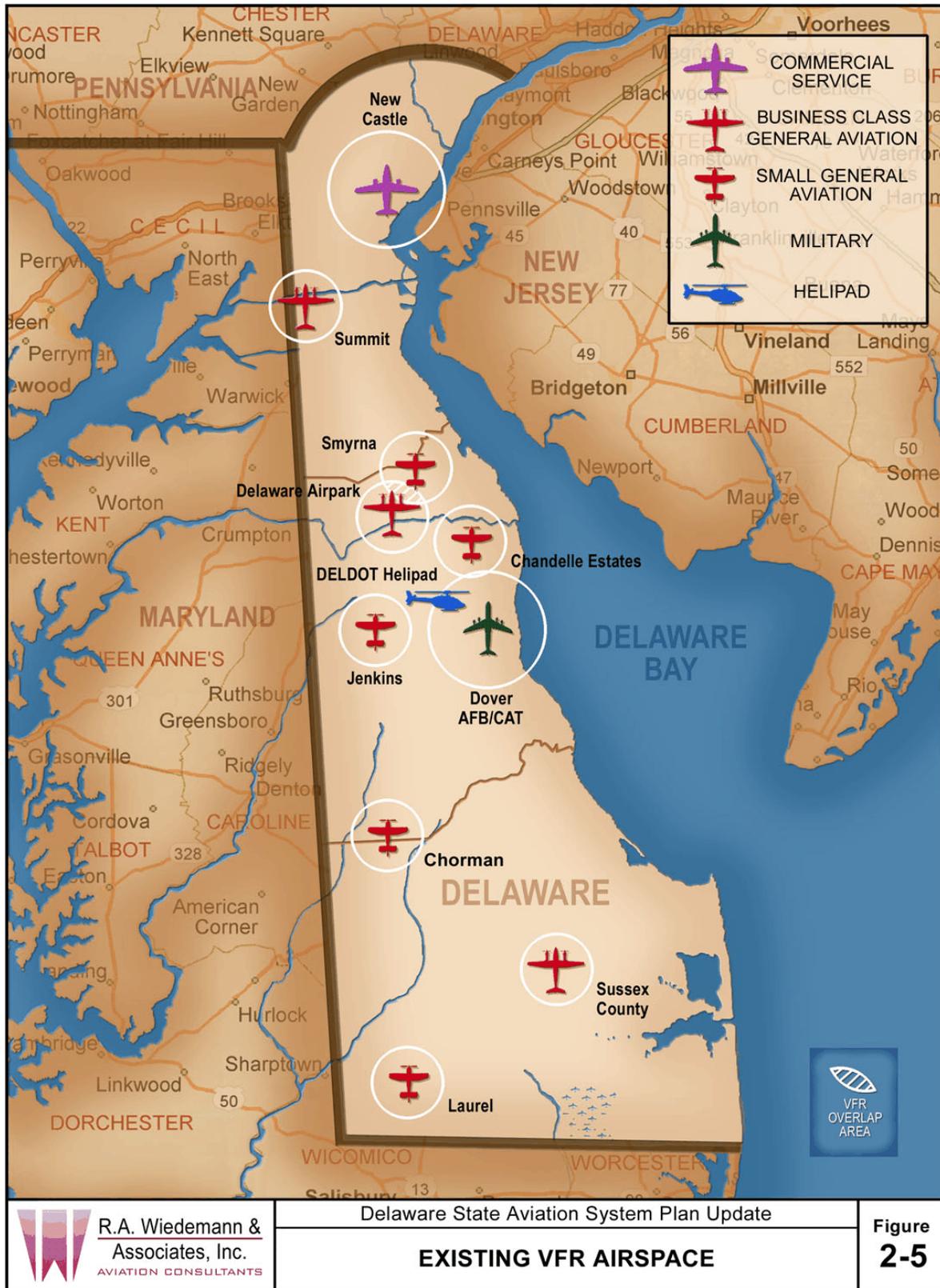
The purpose of identifying IFR and VFR airspace areas is to identify capacity-influencing overlaps between the operational areas of adjacent airports, and to establish guidelines to be used in planning future facilities. Figure 2-5 shows the VFR airspace areas associated with Delaware system airports. Numerous factors influence the capacity and configuration of terminal airspace areas. These include:

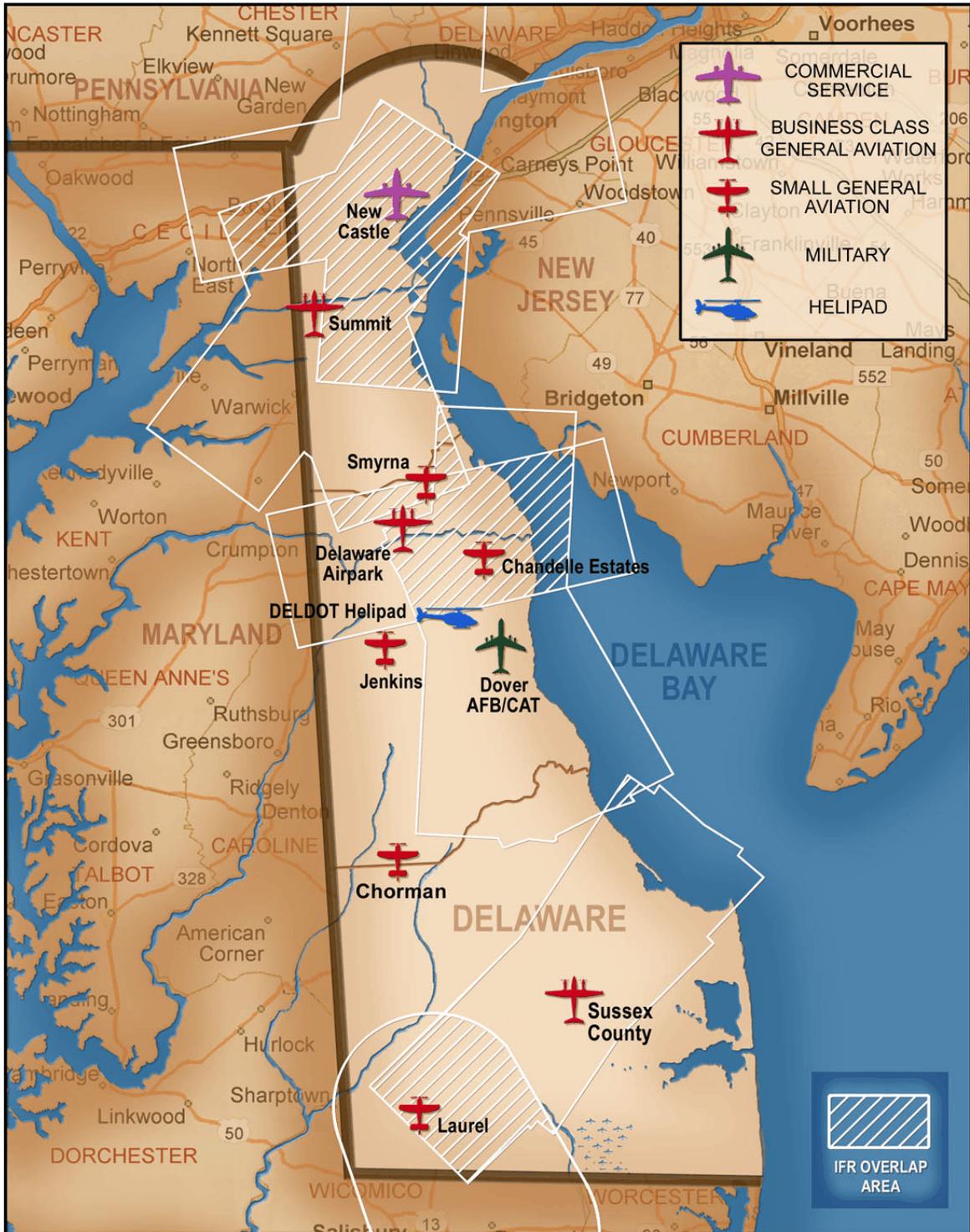
- Airport runway configuration
- Traffic volume
- Noise abatement procedures
- Interaction with neighboring airports
- Airport size
- Aircraft type
- Obstructions
- Navigational aids

IFR reservation areas belong to airports in the State with published instrument approaches. IFR capable airports in Delaware include:

- Delaware Airpark
- Dover AFB
- Laurel Airport
- New Castle Airport
- Summit Airport
- Sussex County Airport

Figure 2-6 depicts the IFR airspace reservation areas that correspond to the type and direction of instrument approach at the IFR capable airports. Table 2-3 presents a listing of instrument approaches at each of these airports.





 R.A. Wiedemann & Associates, Inc.
AVIATION CONSULTANTS

Delaware State Aviation System Plan Update
EXISTING IFR AIRSPACE

Figure 2-6

Table 2-3 - Airport Instrumentation		
AIRPORT	Type of Instrumentation	Designated Runway
Delaware Airpark	GPS -A	9
	VOR	27
Dover AFB	ILS VOR/DME TACAN	1
	ILS TACAN	19
	VOR/DME TACAN	32
Laurel Airport	GPS	32
New Castle County	ILS VOR NDB GPS	1
	VOR MLS GPS	9
	VOR GPS	19
	VOR GPS	27
Summit Airport	RNAV	17
	GPS	35
	VOR-B	N/A
	NDB-A	N/A
Sussex County	RNAV(GPS) VOR	22
	RNAV(GPS) VOR	4

LEGEND:

- VOR = Very high frequency Omnidirectional Range
- DME = Distance Measuring Equipment
- NDB = Non-Directional Beacon
- RNAV = Area Navigation
- TACAN = UHF Navigational Facility - omnidirectional course and distance info.
- ILS = Instrument Landing System
- A = No specific runway designation; B = No specific runway designation

4. LAND USE & ENVIRONMENTAL FACTORS

This section summarizes the land use and environmental factors considered in the preparation of this plan. Areas of concern that affect airport development in Delaware include:

- Land Use Impacting Aviation
- Environmental Factors
 - Meteorological Factors
 - Environmentally Sensitive Areas
 - Bird Strike Potential
 - Noise Sensitive Areas

4.1 Land Use

Delaware is the second most low lying state in the U.S. next to Florida. With its location along the Delaware River and Atlantic Ocean, agriculture, chemical production, residential, and beach tourism development are the primary types of land uses within the State. Over the last decade there has been an explosion of residential development in Delaware. Much of the recent growth is

moving southward as better north-south transportation corridors have been developed (specifically the completion of Highway 1). Housing starts per capita in Delaware are among the nation's highest, ranking in the top five while mortgage closing costs in Delaware rank 25th in the nation - right at the median.² The high growth of housing has converted portions of the agricultural land use in Delaware. For land that is still used for agriculture, the products continue to be corn, soybeans and various vegetables. Poultry farms are numerous in Delaware, and feature large hatcheries and dressing plants. Most of these types of agricultural lands are located in central-south Delaware in order to take advantage of the relatively rich soils and flat land slope.

Most major municipalities have comprehensive land use plans and zoning restrictions within corporate limits. Some municipalities also have land use control over areas surrounding a metropolitan area. All three counties have some form of general land use planning, with limited exercise of positive control on the land use. Typically, county zoning occurs only when there is a need to restrict the land use in a specific portion of the county due to some special activity in the area.

The land uses in the vicinity of Delaware's airports were identified as part of the inventory process. Table 2-4 presents the various airports in Delaware and the existing land uses surrounding each airport. As shown in the table, all of the State's airports have residential land uses nearby. These are the most incompatible of uses near airports. As shown in the Table, additional residential development is anticipated near a number of public-use airports.

Table 2-4 - Existing and Planned Land Uses					
County/Airport	Zoning Jurisdiction	Acreage	Existing Land Use	Existing Zoning in Area	Planned Zoning in Area
Kent					
Chandelle Estates	Kent County	27	Agricultural, Residential	Agricultural	No Change Anticipated
Delaware Airpark	Kent County	65	Light Industrial, Agricultural, Residential	Agricultural, Residential, Limited Industrial	Additional Residential Zoning Anticipated
Dover AFB (C.A.T.)	Kent County/ City of Dover	20	Light Industrial, Agricultural, Residential, Military	Industrial, Residential, Agricultural	No Change Anticipated
Chorman Airport	Kent County	134	Agricultural, Residential	Agricultural	No Change Anticipated
Jenkins Airport	Kent County	60	Agricultural, Residential	Agricultural	No Change Anticipated
Smyrna Airport	Kent County	20	Agricultural, Residential	Agricultural	No Change Anticipated

² Source: National Association of Homebuilders for housing starts and www.bankrate.com for mortgage rates - 2006 data.

Table 2-4 - Existing and Planned Land Uses					
County/Airport	Zoning Jurisdiction	Acreage	Existing Land Use	Existing Zoning in Area	Planned Zoning in Area
New Castle					
New Castle County Airport	New Castle County	1,250	Commercial, Industrial, Office, Residential	Mixed Zone	Possible Changes
Summit Airport	New Castle County	209	Agricultural, Residential, Commercial	Agricultural, Residential, Commercial	Possible Changes
Sussex					
Laurel Airport	Sussex County	88	Agricultural, Residential	Agricultural	Additional Residential Zoning Anticipated
Sussex County Airport	Sussex County	615	Light Industrial, Agricultural, Residential	Agricultural, Residential, Industrial	Additional Residential Zoning Anticipated

4.2 Environmental Factors

There are a number of environmental factors that affect aviation and the development or improvement of airports. These factors include weather conditions and a host of environmentally sensitive elements.

Meteorological Factors

The State of Delaware is characterized by cool winters and mild, humid summers. The January mean temperature is 32 degrees Fahrenheit, while the July mean temperature is 80 degrees Fahrenheit. Since Delaware is located in the mid-Atlantic coastal region, the temperature varies only several degrees throughout the State. However, along the Atlantic shoreline, the climate is noticeably cooler in the summer and warmer in the winter than inland portions of the State. The average annual precipitation varies from 40 to 45 inches, with snowfall averaging 20 inches per year. In relation to airport operation and development, the moderate climate does not present any significant negative impacts. Prevailing winds are from the west and northwest, with an occasional storm originating off-shore and moving east. Airport runway development such as those planned for Delaware Airpark and Sussex County Airport must take into account the wind direction and speed in order to provide for 95 percent crosswind coverage at various wind speeds. Historical wind data is available through the U.S. Department of Commerce, National Climatic Data Center weather observation station records.

Environmentally Sensitive Areas

As defined in this study, environmentally sensitive areas impacted by aviation include all of

the environmental factors described in FAA Order 5050.4B (there are 20 categories). Of these, the most significant impacts relative to aviation and airport development in Delaware would include:

- Aircraft Noise Impacts
- Wildlife Reservations and Waterfowl Refuges
- Wetland Areas and Floodplains
- Public Parks and Recreation Areas
- Historic and Cultural Resources
- Prime & Unique Farmland
- Air Quality
- Water Quality

Many of the impacts on these areas for the State's larger airports are covered in Environmental Assessments associated with recent master plans. Brief summaries of these impacts are contained in the following sections.

Aircraft Noise Impacts

Noise generated by aircraft can have a negative impact on the compatibility of land adjacent to airports. Typically churches, hospitals, schools, parks, amphitheaters, and residential districts are considered to be noise-sensitive receptors. Conversely, noise generated by airports is usually compatible with industrial and agricultural activities. It is important to note that at the system planning level of detail, noise studies for individual airports are beyond the work scope. These detailed studies are prepared for airport master plans and environmental assessments using the latest version of the FAA's Integrated Noise Model (INM). This computer model calculates cumulative aircraft noise, expressed in decibels (dB), at ground level using the yearly average day-night sound level (DNL).

For this study, an approximate measure of potential aircraft noise impact can be gained by examining land uses in the immediate vicinity of each system airport. These uses, combined with the activity levels at each airport will yield a ranking of potential impact from aircraft noise. Such a ranking will be helpful in evaluating alternatives in Phase 2 of the system plan. While not as accurate as the INM, this qualitative measure of noise impact provides an intuitively reasonable means of assessing relative impacts among airports.

Wildlife Reservations and Waterfowl Refuges

Delaware has several wildlife reservations and waterfowl refuges located throughout the State. Those reservation and refuges closest to the system airports and their distance and direction from the airports are listed in Table 2-5. Also shown are distances from the wildlife reservations and waterfowl refuges, none of which are adversely impacted by Delaware's public-use airports.

Table 2-5 - Delaware Wildlife Reservation/Waterfowl Refuges		
County/Airport	Wildlife Area	Approximate Distance/Direction
KENT		
Chandelle Estates	Little Creek Wildlife Area	1 mile east
Delaware Airpark	Blackiston Wildlife Area	6 miles west
Dover AFB	Little Creek Wildlife Area	3 miles east
Chorman Airport	Norman G. Wilder Wildlife Area	12 miles north
Jenkins Airport	Norman G. Wilder Wildlife Area	3 miles southwest
Smyrna Airport	Woodland Beach Wildlife Area Bombay Hook National Wildlife Area	4 miles east-southeast
NEW CASTLE		
Summit Airport	Canal Wildlife Area/Lums Pond State Park	1 mile north
New Castle County	Killcohook National Wildlife Refuge (NJ)	4 miles southeast
SUSSEX		
Laurel Airport	Nanticoke Wildlife Area	4 miles west

Wetland Areas and Floodplains

In Delaware, wetlands are located in every county because of the State's low, flat topography. On-site inspections of each public-use airport indicated that wetlands are located on or near every facility. Although the type of site inspections conducted for this system plan do not constitute wetland delineation, it is clear that any airport improvement or development in the State must be aware of the sensitive nature of the wetland issue. For this inventory, wetland maps provided by the U.S. Department of Interior, Fish and Wildlife Service were collected for each airport facility. These maps will be used later as references for the analysis of alternatives to determine whether any proposed airport expansion will impact nearby wetlands. It is known that wetlands currently impact plans for airport expansion or improvement at Delaware Airpark, Sussex County Airport, and at New Castle Airport.

Floodplains in the vicinity of airports will be examined as a part of the SASPU. In this regard, Federal Emergency Management Agency (FEMA) and state mapping will be used to determine the limits of the base 100-year floodplains and floodways near public-use airports. This information will be used in Phase 2 of the SASPU to rank alternatives with respect to their impacts on nearby flood plains and floodways.

Public Parks and Recreation Areas

Delaware has fourteen state parks and recreation areas totaling 20,729 acres. These parks range in size from 171 acres at Fox Point to 5,193 acres at Cape Henlopen. Activities at these parks

include boating, camping, fishing, game courts, swimming, picnicking, horseback riding, and others. The fourteen state parks, by county of location, and acreage are as follows:

Kent County

- Killens Pond State Park 1,444

New Castle County

- Bellevue State Park 328
- Fox point State Park 171
- Brandywine Creek State Park 933
- Wilmington State Parks 387
- White Clay Creek State Park 3,384
- Fort Delaware State Park 288
- Fort Dupont State Park 332
- Lums Pond State Park 1,790

Sussex County

- Cape Henlopen State Park 5,193
- Delaware Seashore State Park 2,825
- Fenwick Island State Park 344
- Holts Landing State Park 204
- Trap Pond State Park 3,106

GRAND TOTAL 20,729

An examination of the distance of airports in the system from these parks and recreational areas indicated that none of the airports are located adjacent to any of the parks or recreational areas. In Kent County, Jenkins Airport is the closest airport to Killens Pond State Park at just under 9 miles. In New Castle County, Summit Airport is within 2 miles of Lums Pond State Park. These proximities will be used during the evaluation of alternatives to determine whether or not state parks and recreational areas could be negatively impacted by changes or improvements to the State's aviation system.

In addition to parks and recreational areas, other attractions within Delaware draw large numbers of people each year. For some of these events, visitors may use air transportation as a means of access:

- **Air Mobility Command Museum:** The Air Mobility Command Museum is located at Dover AFB and was founded in 1986. It is dedicated to military airlift and tanker history. The base has long been associated with military airlift which is reflected in the museums collection of vintage transport aircraft dating back to WWII. The museum has done numerous restoration projects and has planes and exhibits from the Berlin Airlift, the Korean War, and World War II..
- **Delaware State Fair:** The Delaware State Fair has an attendance of over 300,000. The fairgrounds are home to the annual ten-day Fair in July and encompasses several

businesses including The Centre Ice Rink, the Harrington Raceway, Inc., and the Midway Slots & Simulcast.

- **NASCAR:** More than 250,000 people flock to the high-banked, one-mile concrete oval at Dover International Speedway each race weekend, bringing more than \$94 million annually to the Delaware economy. In 2006, in conjunction with NASCAR's worldwide presence, the Monster Mile, at Dover International Speedway welcomed race fans from all 50 states, Australia, Belgium, England, France, Germany, South Africa and many other destinations from across the globe.
- **Horse Racing:** Delaware has three race tracks: Delaware Park, Dover Downs Harness Racing, and Harrington Raceway. Gaming legislation in Delaware in 1996 allowed the state's three racetracks to have video lottery machines.
- **Golf Courses:** Delaware has 47 public and private golf courses. The 18-hole "Back Creek" course at the Back Creek Golf Course facility in Middletown was ranked the best public course in Delaware, featuring 7,003 yards of golf from the longest tees.
- **Dover Downs Hotel and Casino:** Offers a 97,000 square foot facility that includes 2,700 slot machines, horse racing November through April and simulcast all year. The Hotel has 232 luxury guest rooms, including 12 suites. Live entertainment is available all year round.

Historic and Cultural Resources

An action causing an adverse effect on historic or cultural property protected by Section 106 of the National Historic Preservation Act or by provisions of the National Environmental Protection Act (NEPA), must be considered in airport planning or policy making. Eligibility determinations and effects determinations are solely FAA's responsibilities under Section 106 of the National Historic Preservation Act. In Delaware airport-specific projects involving federal or state funding must be coordinated with the State Historic Preservation Office (SHPO) during the planning stages of any development. Often for these site-specific studies there are requirements to perform archeological site analyses through literature searches, on-site inspections, and various levels of archeological excavation. In addition, architectural studies of historic structures must be made to determine their eligibility for inclusion on the National Register of Historic Places. Impacts to these sites and structures must be evaluated in airport-specific environmental studies funded by the FAA and State.

For the SASPU, the level of detail for historic and cultural resources will be limited to the review of existing archeological investigations and historic architectural analyses that have been completed in the immediate vicinity of public-use airports. Completed studies should be available for Delaware Airpark, New Castle Airport, and Sussex County Airport. These studies will be reviewed during the Phase 2 Alternatives Analysis portion of the SASPU to help determine impact ranking.

Prime And Unique Farmland

Delaware's fertile soils grow corn, truck crops, soybeans, and potatoes. These are found throughout the State, but are predominately evident in the southern two thirds of the State. The

variety of crops grown evidences the existence of prime farmlands in the State. The growing season is approximately six months long and extends from mid-March to the end of September.

Under the Farmland Protection Policy Act (FPPA), the U.S. Department of Agriculture has the authority to protect certain types of farmland from being converted to non-agricultural uses. Farmland protected by the FPPA is either prime farmland which is not already committed to urban development or water storage, or unique farmland, or farmland which is of state or local importance as determined by the appropriate state or local government agency with the concurrence of the Secretary of Agriculture. Some actions are exempt from the FPPA and therefore do not need to be coordinated with the U.S. Department of Agriculture (Soil Conservation Service). Prime farmland is defined by the FPPA as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Prime farmland does not include land already in or committed to urban development or water storage. Unique farmland is land other than prime farmland that is used for production of specific high value food and fiber crops, as determined by the Secretary of Agriculture.

For the SASPU, airport development options will be examined to see if they have the potential to impact prime and unique farmland. Airports where the potential exists include all of the existing public-use airports except New Castle.

Air Quality

Air quality at airports can be affected by the number of aircraft operations, configuration of vehicle access roads and parking, the physical plant, and the types and numbers of ground support equipment. Under the U.S. Environmental Protection Agency (USEPA) conformity regulations, a determination must be made as to whether the project related emission levels exceed established threshold values. Threshold values are outlined in the *FAA Air Quality Handbook*. If threshold values are not exceeded, the project is assumed to conform to the State Implementation Plan (SIP) goal of eliminating or reducing the severity and number of violations of NAAQS and achieving attainment of those standards and no further analysis is necessary.

The Clean Air Act of 1990 as amended states:

"No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to a [State Implementation Plan]."

Thus, in order to gain Federal funding for Delaware Airports, it must be determined whether or not airport improvement projects conform to State or Federal air quality plans. Conformity is defined in the Clean Air Act as conformity to the SIP's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards (NAAQS) and achieving expeditious attainment of such standards, and that such Federal activities will not:

- Cause or contribute to any new violation of any standard in any area.
- Increase the frequency or severity of any existing violation of any standard in any

- area.
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

According to the USEPA Green Book, Kent, New Castle, and Sussex Counties are listed as being in non-attainment of National Ambient Air Quality Standards (NAAQS) for 8-hour ozone, while New Castle County is in non-attainment of particulate matter (PM-2.5). All three counties are in attainment of NAAQS for four priority pollutants (carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead). Kent and Sussex Counties are classified as being in attainment of NAAQS for particulate matter (PM-2.5) concentrations.³ All three counties are included in Delaware's State Implementation Plan, which prescribes the necessary steps to reduce pollutants that are not in attainment.

Water Quality

Water quality standards apply to certain types of airport development projects. Similar to air quality standards, the emphasis on enforcement deals with new development actions at airports that have received or are eligible for Federal funding. Construction impacts on water quality deal with water supplies, waste treatment capacity, erosion controls to prevent siltation, provisions for containing fuel spills, and location with regard to an aquifer or sensitive ecological area such as a wetland.

Of significance is the Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES) permit application regulations for storm water discharges. The regulations require operators of large municipal separate stormwater systems serving municipalities with populations greater than 250,000, and medium municipalities with population greater than 100,000 but less than 250,000 to submit permit applications for their separate municipal storm sewer system. Covered by the regulations are transportation facilities such as vehicle maintenance, equipment cleaning areas, and airport de-icing areas. As nonpoint source polluters, airports have been required to file for an NPDES permit if they are using their own separate stormwater system, or, if they are using a municipal stormwater system for surfacewater runoff, they are required to certify to the municipality that the surfacewater runoff is in compliance with the municipality's NPDES permit requirements.

New airport development projects are subject to the NPDES regulations. In addition, the system plan has documented airports in Delaware that have complied with the regulations. These include:

- Civil Air Terminal at Dover AFB
- Delaware Airpark
- New Castle Airport
- Summit Airport

³ (Source: www.epa.gov/air/oaqps/greenbk/index.html).

- Sussex County Airport

Presently, no other Delaware airports are required to obtain NPDES permits.

5. SOCIOECONOMIC BASE

Socioeconomic statistics are generally used to describe the economic and demographic trends expected to occur in a particular area. Socioeconomic factors have been shown in numerous studies sponsored by the FAA to be related to an area's demand for aviation facilities and services. Among the most significant are population, income, and employment. This section identifies each of these factors and presents historical statistics and trends for the years 1990-2004 for all three Delaware counties.

5.1 Population

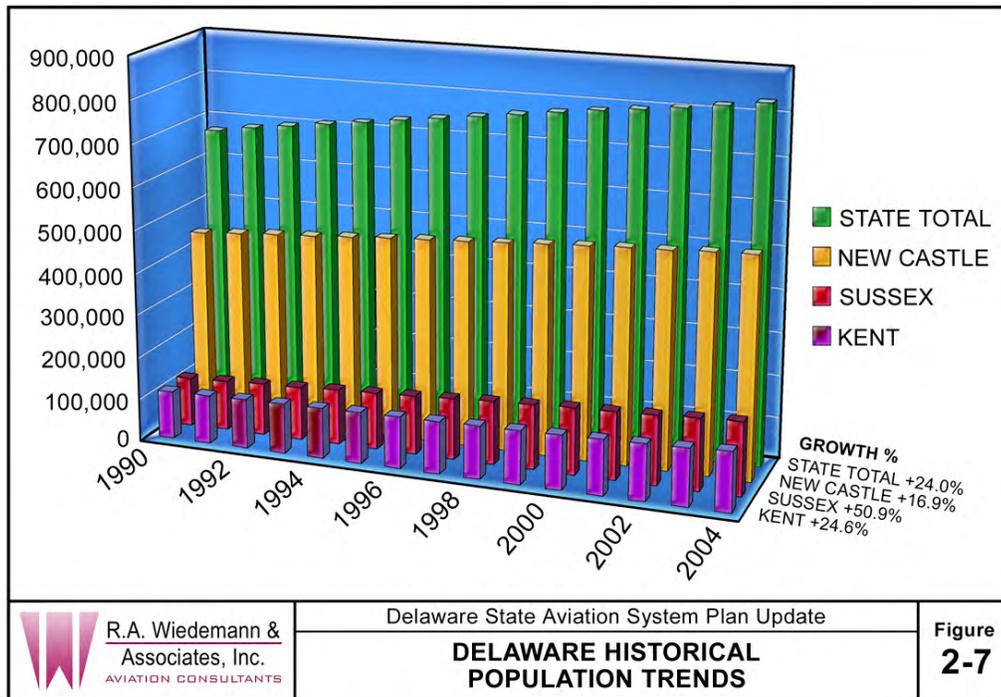
Analysis and projection of population are the basis for almost all major planning decisions. In many instances, they determine the level of demand for future facilities and serve as indices of most county and urban characteristics. Further, they have typically served as one of the best indicators of local aviation demand. Historical population, when compared to aviation demand statistics, has shown a high correlation in many areas of the country. Until population growth or decline in the study area is compared to aviation demand statistics in Delaware, it is uncertain whether or not population can be used as a prediction variable in the forecasting process.

Table 2-6 presents the historical population growth for Delaware counties (see Figure 2-7). As shown, Sussex County has shown the highest percentage growth (50.9 percent), while New Castle County has shown the highest actual population growth (a net gain of 74,944 over the period). For the State, there has been a 24 percent growth over the 1990-2004 period, growing from 669,567 to 830,069.

Year	Kent	New Castle	Sussex	State Total
1990	111,638	443,784	114,145	669,567
1991	114,288	450,843	117,949	683,080
1992	115,682	457,210	122,033	694,925
1993	117,987	462,245	126,146	706,378
1994	119,039	468,297	130,209	717,545
1995	120,715	474,435	134,584	729,734
1996	121,447	479,995	139,535	740,977
1997	122,419	485,166	143,902	751,487
1998	124,056	490,382	148,897	763,335
1999	125,611	496,079	153,300	774,990
2000	127,108	501,865	157,468	786,441

Table 2-6 - Delaware Historical Population Trends ¹				
Year	Kent	New Castle	Sussex	State Total
2001	129,065	505,888	160,464	795,417
2002	131,591	510,005	164,171	805,767
2003	134,626	514,801	168,400	817,827
2004	139,118	518,728	172,223	830,069
% Change	24.6%	16.9%	50.9%	24.0%

¹ Source: Regional Economic Information System, Bureau of Economic Analysis (BEA), U.S. Department of Commerce, May 2006. This source is the same used by the University of Delaware, Bureau of Economic Research.



5.2 Income

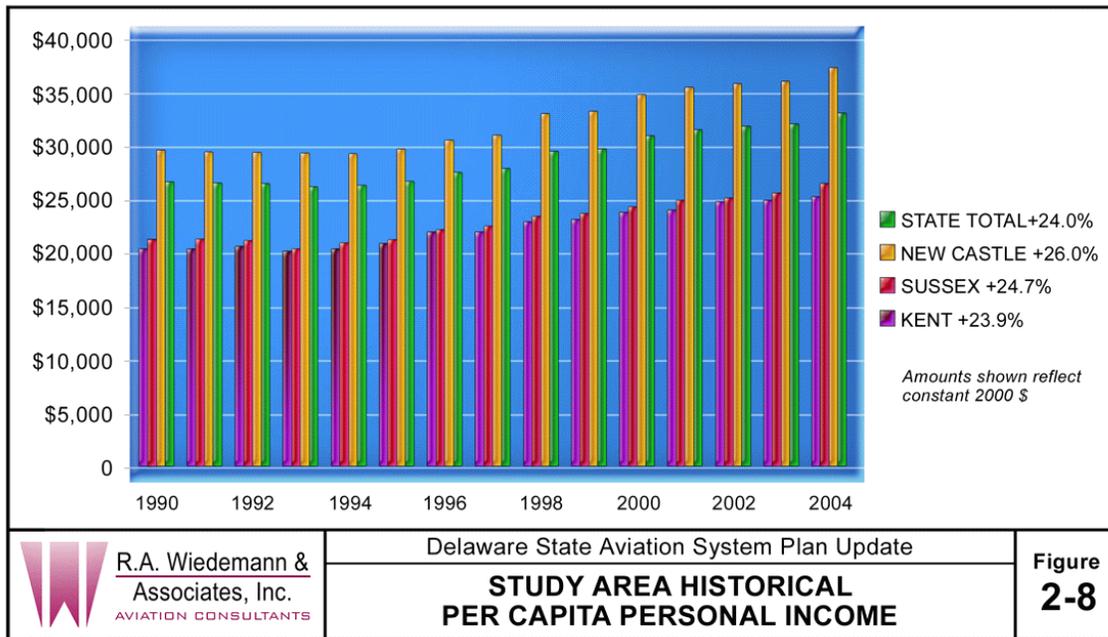
Similar to population, an area's income and economic activity has been shown to be positively related to the demand for aviation services and facilities in many parts of the country. Further, there is an assumed causal relationship between concentrated economic activity and demand for air transportation.

Income statistics commonly include Total Personal Income (TPI) and Per Capita Personal Income (PCPI). For aviation demand forecasting purposes, PCPI is the preferred statistic since it removes the population growth factor from the income growth factor. Thus, PCPI statistics for Delaware counties were collected for the inventory. Table 2-7 presents the historical growth in PCPI for the three counties (see Figure 2-8). It should be noted that these numbers are shown in constant 2000 dollars, meaning that the effects of inflation have been removed from the data.

Table 2-7 - Study Area Historical PCPI (Constant 2000 \$)¹				
Year	Kent	New Castle	Sussex	State Total
1990	\$20,355	\$29,579	\$21,200	\$26,612
1991	\$20,348	\$29,407	\$21,235	\$26,481
1992	\$20,556	\$29,318	\$21,092	\$26,415
1993	\$20,108	\$29,290	\$20,335	\$26,157
1994	\$20,333	\$29,231	\$20,914	\$26,245
1995	\$20,855	\$29,679	\$21,182	\$26,652
1996	\$21,903	\$30,482	\$22,124	\$27,502
1997	\$21,898	\$30,927	\$22,444	\$27,832
1998	\$22,828	\$32,949	\$23,368	\$29,436
1999	\$23,047	\$33,164	\$23,657	\$29,644
2000	\$23,767	\$34,750	\$24,234	\$30,869
2001	\$23,992	\$35,429	\$24,887	\$31,447
2002	\$24,763	\$35,777	\$25,081	\$31,799
2003	\$24,844	\$36,002	\$25,514	\$32,005
2004	\$25,213	\$37,280	\$26,430	\$33,007
% Change	23.9%	26.0%	24.7%	24.0%

Source: Regional Economic Information System, Bureau of Economic Analysis (BEA), U.S. Department of Commerce. Estimates were converted to 2000 \$ using BEA Personal Consumption Deflators.

As shown in the table, per capita personal income in Delaware area has grown by 24 percent over the fourteen year period. This translates into a compound growth of 1.5 percent per year. New Castle County has grown slightly faster than either Sussex or Kent Counties, increasing the gap between income levels in northern Delaware versus the central and southern portions of the State.



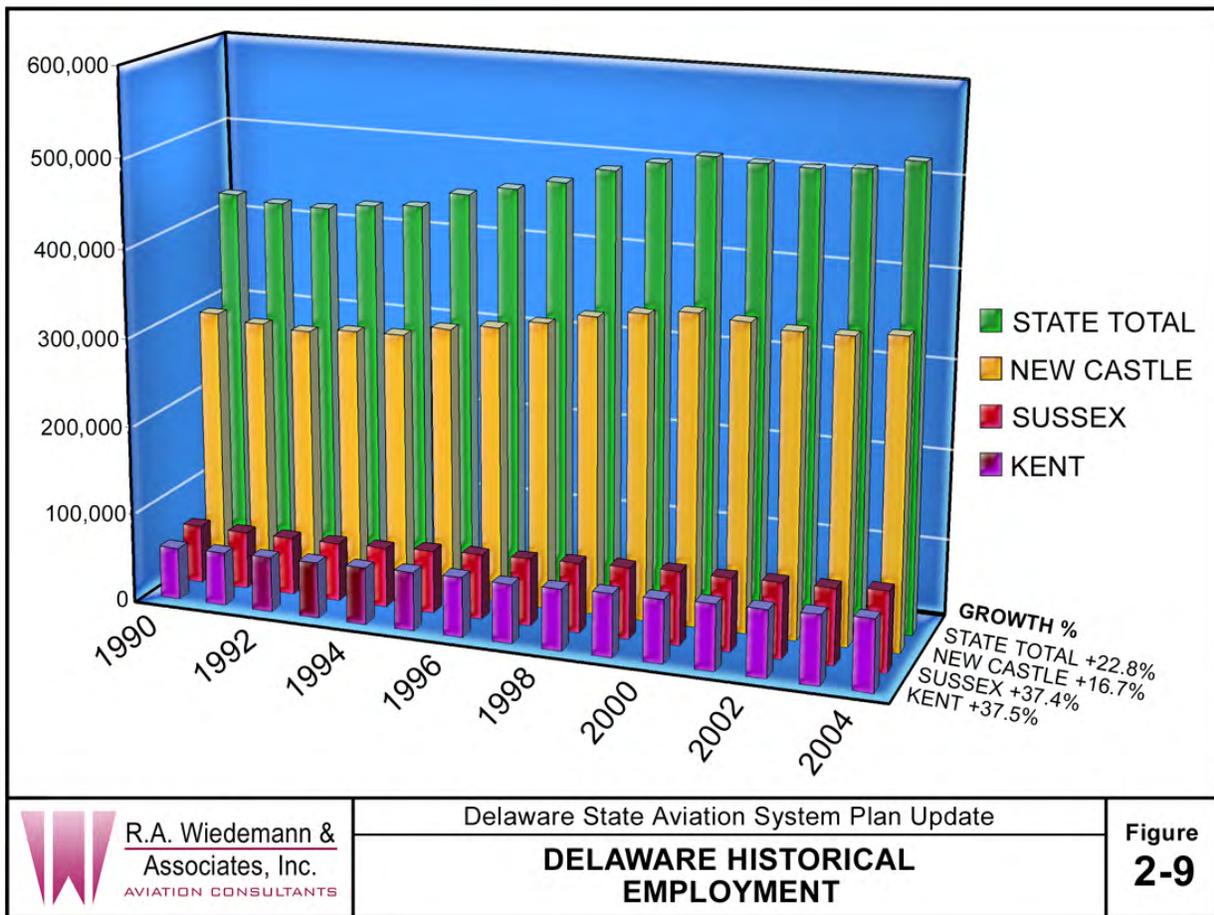
5.3 Employment

Employment statistics are another measure of economic activity and thus are related to the demand for air transportation facilities and services. Historical employment statistics for Delaware counties are presented in Table 2-8. As shown, overall employment for Delaware grew by 22.8 percent over the period. Kent County showed the fastest growth with 37.5 percent, while New Castle County had the slowest growth with 16.7 percent. These statistics are consistent with the population trends described earlier.

Year	Kent	New Castle	Sussex	State Total
1990	58,595	298,418	65,927	422,940
1991	60,313	291,390	65,331	417,034
1992	62,086	288,227	65,539	415,852
1993	63,213	293,880	66,323	423,416
1994	64,458	295,093	67,627	427,178
1995	66,442	307,338	71,598	445,378
1996	67,549	314,281	73,964	455,794
1997	67,024	324,340	76,166	467,530
1998	68,872	336,944	78,843	484,659
1999	71,091	345,263	80,721	497,075
2000	72,525	352,024	83,271	507,820

Table 2-8 - Delaware Historical Employment ¹				
Year	Kent	New Castle	Sussex	State Total
2001	74,477	347,292	83,135	504,904
2002	76,137	341,985	85,316	503,438
2003	77,750	342,913	86,735	507,398
2004	80,591	348,233	90,592	519,416
%Change	37.5%	16.7%	37.4%	22.8%

Source: Regional Economic Information System, Bureau of Economic Analysis (BEA), U.S. Department of Commerce, May 2006.



6. SURFACE TRANSPORTATION

An inventory of the surface transportation network in Delaware provides the capability to examine the interaction of the air and ground transportation systems in the State. The surface transportation system in Delaware is comprised of a network of roadways that provide ground connectivity throughout the State (Figure 2-1, presented earlier). Interstate 95 crosses Delaware southwest-to-northeast across New Castle County. In addition to I-95, there are seven principal highways: U.S. Highway 9, U.S. Highway 13, U.S. Highway 40, U.S. Highway 113, U.S. Highway 202, U.S. Route 301, and Delaware Route 1. U.S. 13, U.S. 113, and Delaware Route 1 are primary north-south highways connecting Wilmington and Pennsylvania with Maryland's eastern shore, while U.S. 40, the primary east-west route, connects Maryland with New Jersey. The state also operates two toll highways, the Delaware Turnpike, which is Interstate 95 between Maryland and New Castle and the Korean War Veterans Memorial Highway, which is Delaware Route 1 between Dover and Interstate 95 near Wilmington.

6.1 Airport-Specific Demand

On-airport or at-airport access in the state features highways of varying capacities and demand loadings. Existing traffic generated from airport operations are shown in Table 2-9. As shown, the number of peak hour vehicles generated by each public-use airport varies by airport type and location. In particular, New Castle Airport has the highest demand, but there are more than four separate entrance ways to the Airport - spreading peak hour demand.

Table 2-9 - Existing Surface Access Demand			
Airport Name	Access Road	2005 Peak Hour Operations ¹	2005 Peak Hour Vehicle Trips ²
Chandelle Estates	Route 9	6	14
Chorman	Nine Foot Road	13	30
Civil Air Terminal at Dover AFB	Horsepond Road	26	61
Delaware Airpark	State Route 42	22	51
Jenkins	Westville Road	2	5
Laurel	State Route 24	7	16
New Castle Airport	US 13, State Routes 273,58, & 202	82	192
Smyrna	State Route 6	2	5
Summit	US 301	42	98
Sussex County	Airport Road, S Railroad Ave	31	73

¹ Source: Inventory of aviation activity.

² Vehicle trips estimated from general aviation industry averages of 2.35 times peak hour operations (originally published in Aviation Demand and Airport Facility Requirement Forecasts for Medium Air Transportation Hubs Through 1980). This number accounts for pilots, passengers, and employees at the airport.

6.2 Public Transportation

The public transportation system, DART First State, has broad coverage within New Castle County with close association to major highways in Kent and Sussex Counties. The system includes bus, passenger rail, subsidized taxi and paratransit modes, the latter consisting of a state-wide door-to-door bus service for the elderly and disabled. Passenger rail service, like interstate highway service, is limited to a single southwest-to-northeast corridor in New Castle County. Ferry service exists between Lewes, Delaware and Cape May, New Jersey, across the mouth of the Delaware Bay.

Another aspect of the surface transportation system that interfaces with the airport system involves ground access services to and from public-use airports. In this regard, the smaller and more remote airports have only taxi service (Chandelle, Jenkins, Chorman, Smyrna, and Laurel Airports). Rental car services are available at Delaware Airpark, Sussex County Airport, the Civil Air Terminal in Dover, Summit Airport, and New Castle Airport. Bus service is available only to New Castle Airport.

7. STATUTES AND REGULATIONS

Government at all levels have long been involved in the regulation, funding, and development of aviation. This section presents a summary of relevant federal and State legislation and regulations which may affect the development of the Delaware Aviation System Plan Update.

7.1 Federal Legislation

The federal government has assisted and encouraged the aviation industry from its inception. In this regard, aviation safety has been relegated to the control of the FAA. The FAA establishes, operates, and maintains the nation's air traffic control and navigation facilities and provides both technical standards and funding for airport facility construction.

Significant federal legislation regarding airports has included the following:

- Federal Airport Act of 1946: (funding)
- Federal Aviation Act of 1958: (regulation)
- National Environmental Protection Act of 1969: (environmental)
- Department of Transportation Act of 1966: (organization)
- Airport and Airway Development Act of 1970, as amended: (funding)
- Airline Deregulation Act of 1978: (deregulation)
- Airport and Airway Improvement Act of 1982: (funding)
- Airport and Airway Safety and Capacity Expansion Act of 1987: (funding)
- Clean Air Act of 1990: (environmental)
- Federal Aviation Administration Authorization Act of 1994: (funding)
- Aviation Investment and Reform Act for the 21st Century, 2000: (funding)
- Aviation and Transportation Security Act of 2001: (aviation security)
- Vision 100, the Century of Aviation Act of 2003: (funding)

These and other environmental legislation make up the bulk of federal involvement in the nation's aviation system. Essentially, the federal government provides funding for airport development, airport security, rules for the operation of aircraft and airports, and environmental protection for the operation and development of the system.

7.2 State Legislation

State legislation pertaining to aviation in Delaware is contained primarily in Title 2, Parts 1 and 2 of the State Code (Transportation, Aeronautics). These statutes define the State's authority and legal role in the aviation system in Delaware. Powers granted to the State provide that DeIDOT be involved in the following:

- Encourage the development of aeronautics, the establishment of airports and other air navigation facilities.
- Coordinate aeronautical matters between the federal government and political subdivisions of the state and others.
- Participate in the investigation of aircraft accidents.
- Enforce aviation safety standards, flight regulations and aeronautical laws.
- Design and map airways systems for the State that are in conformance with federal standards.
- Offer engineering and design services for airports free of charge to any political subdivision requesting such services.
- Provide financial assistance to political subdivisions in support of airport development, operation, and maintenance.
- License and inspect airports, airmen, aircraft, air schools, or aeronautics instructors for safety, qualifications, airworthiness, etc. DeIDOT cannot grant exclusive rights to any airport or aviation facility.
- Receive and disburse federal money for airports. Acquire and operate State airports.
- Invoke penalties against violators of aeronautics laws.
- Establish the Delaware Aviation Advisory Council (DAAC) to promote the interests of aviation in Delaware.
- Remove existing obstructions to air navigation either on or off existing public-use airport property. The power of eminent domain is conveyed by State law to DeIDOT for this purpose. Also, the authority to review building permits and deny potential obstructions to air navigation is granted to DeIDOT.

The Federal Aviation Regulations (Part A of Subtitle VII of Title 49 of the United States Code, as amended) govern the operation of aircraft and are therefore adopted by the State of Delaware into their laws. Appendix 2-B of this chapter includes copies of the current State aviation statutes as listed on the State's website.

An important task of the SASPU will be to recommend updates to aeronautical legislation or new initiatives that are needed. These recommendations are aimed at improving the role and function of the State regarding their aviation system in Delaware. It will be important for the DAAC to input the development of these recommendations as they are identified.

8. UPDATE ECONOMIC IMPACT OF AVIATION

As a part of the SASPU, the economic impact of aviation in Delaware was updated. Results of this update confirmed that for 2005, the economic impact of aviation on the State of Delaware totaled almost \$989 million supporting almost 15,500 jobs, and providing \$594 million in income to its citizens. In addition, the aviation industry in Delaware provided a state and local tax benefit of over \$39 million in 2005 from the economic activity associated with aviation.

The update of economic impact information traced the movement of expenditures through the various economic sectors until the money is exported incrementally from the State through purchases of outside goods and services. The study process and summary results are presented in this section, while greater detail is included in Appendix 2-C.

8.1 Method of Analysis

The goals of this economic impact update were to quantify the following aspects of aviation in Delaware:

- **Direct Spending:** On-airport spending on employment, operations, and capital expenditures. Other direct spending includes off-airport spending by air travelers for rental cars, hotels, restaurants, etc.
- **Induced Benefits:** Multiplied effects of the circulation of money through spending and re-spending.
- **Jobs and Income:** Amount of income generated by aviation and the number of jobs supported by aviation in Delaware.
- **Total Output in Dollars:** The combined impacts of direct and induced spending.
- **Taxes:** Total tax revenue contribution of the aviation industry to local and State units of government in Delaware.
- **Importance of Aviation:** Descriptions and quantification of the importance of aviation to the economy.

To accomplish these goals, the study utilized the following simplified process and methodology:

- Collect Data on Direct and Indirect Impacts
 - Distribute Surveys
 - Collect Secondary Source Materials
- Apply Regional Multipliers to Direct and Indirect Impact Numbers
- Analyze and Distribute Results
- Summarize All Impacts

8.2 Data Collection

The most significant, work-intensive portion of the economic impact analysis was the data collection effort. Results of the inventory and data collection formed the basis for inputs to the economic impact model. If any data were flawed or incorrect, the model would have multiplied that

error. Therefore, the greatest care was given to the collection process and the thoroughness in which the data was examined. To perform the inventory and data collection process, the following items were reviewed or gathered:

- Review of Previous Studies
- Survey of Airport Tenants and Users
- Airport Data Profile
- Military Aviation in Delaware
- Economic Data and Statewide Statistics

The review of previous studies provided the basis for assessing the goals of the current study and for establishing previous benchmarks for economic impact analysis of Delaware airports. The review included the *Economic Impact Assessment of Delaware Airports and Aviation* (1999), the *Summit Airport Business Plan* (2005), and the *Sussex County Airport Business Plan* (2006). Information from these plans was compared to the results obtained in this update to ensure reasonable results.

Survey of Airport Tenants and Users

For airport specific studies such as this, surveys are often the only way to access local data. In this regard, two surveys were developed and administered to different segments of Delaware's aviation economy: Aircraft Tenant Surveys; and On-Airport Employer Surveys. Results from the surveys were key to the estimation of economic impacts of aviation in Delaware. The Aircraft Tenant Surveys revealed that average spending on single engine and twin engine propeller based aircraft totaled \$11,153 in 2005. The On-Airport Employer surveys were distributed to all on-airport employers such as businesses, organizations, or units of government and at the public-use airports. Only the aviation-related business responses were considered, since non-aviation related businesses did not necessarily need an airport location.

Airport Data Profile

Information was gathered about each Delaware public-use airport in the form of a data profile. This information could be used to assess the size, character, and market base of each airport. Results of this data collection effort indicated that Delaware is served by 11 different aviation facilities, all varying in size and complexity. In all, there are five regional service airports (grouping Dover AFB with the CAT) and five local service facilities and one helistop. Three of the State's public-use airports have turf runways only, and the other six have paved surfaces. The size, services, and runway surface and dimensions of an airport determine its classification as either local or regional service. The larger airports are regional in their reach serving large businesses and institutions, while the smaller facilities with less infrastructure cater to a local set of users.

Military Aviation In Delaware

The economic influence of military aviation in Delaware is significant. In this regard, there are two airports that serve the bulk of military aviation in the State: Dover Air Force Base (AFB),

and New Castle Airport. Due to its size and activity, Dover AFB has the largest economic impact of any military installation in the State. There are roughly 7,800 workers on the Base, with an estimated additional 10,000 Air Force retirees in the impact area. Total payroll is over \$434.1 million, with other local expenditures totaling more than \$62.6 million. Including multiplier effects, Dover AFB has a total economic impact of \$528.2 million annually, supporting the equivalent of 11,700 full time workers.

There are two military units located at New Castle County Airport: the Delaware Air National Guard, and the Army National Guard. The National Guard employs an estimated 200 full time and 1,100 part time personnel. Estimated local expenditures for these military units is approximately \$23 million annually, with payrolls totaling the majority of those costs. These impacts are included in the New Castle Airport totals.

Other Economic Data

Other economic and statewide data were collected for this study effort, including travel and tourism profiles, socioeconomic data, and tax information. The tourism profiles contained data concerning visitor expenditures and average length of stay. The socioeconomic data provided population, income, and employment trends for each Delaware county. The tax information was compiled in order to estimate the contributions of aviation to the local and state tax revenues. Finally, these data were entered into the IMPLAN model to estimate the multiplier or ripple effects.

8.3 Economic Impact Evaluation

To adequately measure economic impacts, an analysis that follows an industry-wide accepted methodology was used in this study. That methodology first identified the direct spending and employment at airports (called direct impacts) and included the direct spending at off-airport sites such as hotels and restaurants (also lumped with direct impacts). Armed with this information, regional multipliers were applied to the data using the IMPLAN model to determine the multiplied impacts of direct and indirect spending (called induced impacts). The technical processes involved in developing the analysis included the following:

- Direct Impacts
- Induced Economic Impacts
- Application to Delaware Aviation
- Other Key Outputs

Direct and Indirect Impacts

The value of on-airport direct impacts is the sum of all payroll, capital expenditures, operating and maintenance costs, taxes, and fees incurred by providers of services at the airport. Off-airport direct impacts include the sum of the fees and charges paid, time and cost savings, expenses related to food, lodging, ground transportation, and similar outlays. The collection of data concerning direct impacts is essential for the accurate assessment of overall economic impacts of aviation.

Induced Economic Impacts

Induced economic impacts are the *multiplied effects* of the direct and indirect impacts. Induced impacts are created by the successive rounds of spending in the local economy until the original direct or indirect impact has been incrementally exported from the local area. Thus, the economic impacts of aviation can be felt in parts of Delaware's economy that are far removed from aviation. Regions that are more economically self-sufficient have higher responding "multipliers" than do regions that are more dependent on regional imports since less of the money is siphoned out of the community for goods and services.

For this study, IMPLAN software was selected as the best input-output model for developing responding multipliers. IMPLAN, developed originally by the US Forest Service, is a comprehensive impact system that is built on the framework on input-output and social accounting methodology. The database is maintained at the county level, and includes the latest business censuses (1997) supplemented by County Business Patterns and other data derived from the Bureau of Economic Analysis.

The input-output and social accounting models are derived from national data with adjustments made to reflect regional specialization, size and industrial composition. The procedures used to accomplish this are well-known and accepted in the literature on nonsurvey techniques. Since IMPLAN provides a much more comprehensive system (i.e., the complete input-output table or social accounts, in contrast to RIMS II and EIFS that only provide aggregate multipliers), it is possible to trace impacts of change in one sector on other sectors in a more detailed fashion.

Application to Delaware Aviation

The final step in the analytical process of regional economic impact analysis is the estimation of the induced or multiplied effects of Delaware's direct and indirect aviation impacts. Using the IMPLAN software, multiplier tables were generated for each Delaware county for all of the potential impacted industries. Results and data from the estimation of direct impacts were applied to the appropriate multiplier process and the results were summed for each airport to obtain output and employment totals supported by aviation. Table 2-10 presents a summary of each airport's direct and induced economic impacts.

Other Key Outputs

There are two other key outputs that have resulted from this study. They included the following:

- State and Local Tax impacts
- Non-monetary Impacts

Each of these outputs are described in the following sections.

State and Local Tax Impacts

When discussing economic impacts of aviation, many people are interested in the collective benefits to the local municipalities and the State of Delaware. One measure of the collective local benefits involves the level of taxes paid to these local governmental units. In Delaware, there are a variety of taxes paid by airports and aviation users:

- Airport property taxes on privately owned airports
- Payroll taxes
- Aviation fuel tax
- Public accommodations tax

With the exception of airport property taxes on privately owned airports, these tax impacts were estimated by the IMPLAN model for expenditures at the State and local level. Estimated tax impacts from aviation for Delaware totaled \$39,180,100 in 2005. This tax revenue benefits all Delaware citizens, not just those in aviation.

Non-monetary Impacts

There are a number of non-monetary benefits of aviation that have not been mentioned in this analysis. Some of these benefits include:

- ***Transportation Benefits:*** Defined as the time saved and cost avoided by travelers who use airports rather than the next best alternative. Airports in Delaware provide access to the National Air Transportation System.
- ***NASCAR Race:*** Each year, NASCAR driver and race teams fly into Delaware to participate in races that generate significant economic impacts. Without aviation facilities, competition for these races may be lost to other venues.
- ***Stimulation of Business:*** Airports have been shown in other studies to be an important factor in the attraction and siting of new businesses in a community. This is particularly true for businesses with over 100 employees.

Table 2-10 - Direct and Induced Impacts for Delaware Airports and Aviation

AIRPORT	Direct Employment	Direct Impacts	Direct airport related income	Induced Employment	Induced Impacts	Estimated State/local taxes	Grand Total Employment	Grand Total Income ²	Grand Total Impacts
Chandelle Estates	2	\$128,500	\$63,000	0	\$51,900	\$6,700	2	\$83,800	\$180,400
Chorman	12	\$1,734,000	\$496,700	4	\$781,000	\$120,700	16	\$658,800	\$2,515,000
Dover AFB ¹	7,807	\$370,515,700	\$307,909,700	3,904	\$133,385,700	\$21,045,800	11,711	\$434,152,700	\$528,180,200
Delaware Airpark	30	\$2,656,200	\$893,200	15	\$954,400	\$137,400	45	\$1,261,700	\$3,610,600
Jenkins Airport	2	\$87,700	\$43,000	0	\$35,400	\$4,600	2	\$57,200	\$123,100
Laurel Airport	16	\$2,180,800	\$842,000	11	\$941,100	\$187,800	27	\$1,158,400	\$3,121,900
New Castle Airport	1,817	\$200,062,700	\$66,859,600	645	\$72,048,300	\$8,805,800	2,462	\$92,908,500	\$272,111,000
Smyrna Airport	1	\$60,300	\$26,000	0	\$23,500	\$3,100	1	\$35,300	\$83,800
Summit Airport	100	\$17,855,600	\$4,890,000	94	\$10,141,500	\$1,313,400	194	\$8,353,200	\$27,997,100
Sussex County Airport	461	\$104,127,900	\$39,456,700	560	\$46,920,800	\$7,554,800	1,021	\$55,439,300	\$151,048,700
DELDOT Helistop	--	--		--	--		--	--	--
GRAND TOTALS	10,248	\$699,409,400	\$421,479,900	5,233	\$265,283,600	\$39,180,100	15,481	\$594,108,900	\$988,971,800

¹ Joint-use facility with State-owned civil facilities.

² Total income component shown here for descriptive purposes.

- ***Aeromedical Evacuation:*** Airports often serve as bases for aeromedical evacuation teams or flight services. This life-saving function has intrinsic value that often cannot be adequately quantified.
- ***Recreation:*** Roughly 50 percent of commercial airline travel and 60 percent of general aviation travel is for recreational purposes. This includes the valuable tourist trade which brings economic activity to the study region.

All of the above factors point to a value of an airport that is not easily quantified. The impacts that were estimated within the body of this report - direct, indirect, and induced - are only one facet of the overall picture. The value of airports and aviation use in Delaware are much more than these numbers can estimate. It is part of a scarce resource that needs support, protection, and appreciation from all the citizens it benefits both directly and indirectly.

**Appendix 2-A:
Private Use Airports and Heliports**

Table C-1 - Privately Owned, Private-Use Airports and Heliports

Number	Name	FAA Code	Facility Type	Description	County	Directions	Owner
1	Wilmington Country Club	DE05	Heliport	32' x 32' Asphalt	New Castle	2 miles south of Greenville, DE at Wilmington Country Club	Wilmington Country Club
2	Rollins Bldg	DE16	Heliport	66' x 66' Concrete	New Castle	2 miles north of Wilmington, DE on Powder Mill Rd.	Rollins Properties, Inc
3	Delaware Museum	DE06	Heliport	150' x 150' Turf	New Castle	5 miles northwest of Wilmington near Wilmington Country Club	De Museum of Natural History
4	Greenville	DE31	Heliport	80' x 80' Concrete	New Castle	1 Mile north of Wilmington DE on Kennett Pike	MBNA Corp
5	A.I.Dupont Institute	DE28	Heliport	25' x 25' Concrete	New Castle	3 miles north of Wilmington, DE at 1600 Rockland Rd.	Alfred I Dupont Institute
6	Bracebridge III	DE30	Heliport	83' x 75' Concrete Rooftop	New Castle	Wilmington DE off North King St.	MBNA Corp
7	Christina Hospital	DE26	Heliport	120' x 60' Concrete	New Castle	3 miles east of Newark, DE off Churchmans Rd.	Charles R. Sears Sr
8	Strawbridge Christiana Mall	DE18	Heliport	60' x 60' Concrete	New Castle	1 mile northwest of Christiana, DE on North Brownleaf Rd	Strawbridge & Clothier
9	Eagle Run	DE01	Heliport	60' x 60' Asphalt	New Castle	1 mile southeast of Christiana, DE at the end of Abby Rd.	E.i. du Pont De Nemours & co
10	Mckeown	1DE5	Airport	1,100' x 60' Turf	Kent	5 Miles northwest of Middletown, DE at 854 Old School House Rd.19709	Robert Mckeown
11	Okolona Plantation	DE33	Airport	1,300' x 70' Turf	Kent	3 miles northeast of Middletown DE at 1321 Shall Cross Lake Rd	Paul & Christine Berkeley

Table A-1 - Privately Owned, Private-Use Airports and Heliports

Number	Name	FAA Code	Facility Type	Description	County	Directions	Owner
1	Wilmington Country Club	DE05	Heliport	32' x 32' Asphalt	New Castle	2 miles south of Greenville, DE at Wilmington Country Club	Wilmington Country Club
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4	Greenville	DE31	Heliport	80' x 80' Concrete	New Castle	1 Mile north of Wilmington DE on Kennett Pike	MBNA Corp
5	A.I.Dupont Institute	DE28	Heliport	25' x 25' Concrete	New Castle	3 miles north of Wilmington, DE at 1600 Rockland Rd.	Alfred I Dupont Institute
6	Bracebridge III	DE30	Heliport	83' x 75' Concrete Rooftop	New Castle	Wilmington DE off North King St.	MBNA Corp
7	Christina Hospital	DE26	Heliport	120' x 60' Concrete	New Castle	3 miles east of Newark, DE off Churchmans Rd.	Charles R. Sears Sr
8	Strawbridge Christiana Mall	DE18	Heliport	60' x 60' Concrete	New Castle	1 mile northwest of Christiana, DE on North Brownleaf Rd	Strawbridge & Clothier
9	Eagle Run	DE01	Heliport	60' x 60' Asphalt	New Castle	1 mile southeast of Christiana, DE at the end of Abby Rd.	E.I. du Pont De Nemours & Co
10	Mckeown	1DE5	Airport	1,100' x 60' Turf	Kent	5 Miles northwest of Middletown, DE at 854 Old School House Rd.19709	Robert Mckeown
11	Okolona Plantation	DE33	Airport	1,300' x 70' Turf	Kent	3 miles northeast of Middletown DE at 1321 Shall Cross Lake Rd	Paul & Christine Berkeley

Table A-1 - Privately Owned, Private-Use Airports and Heliports

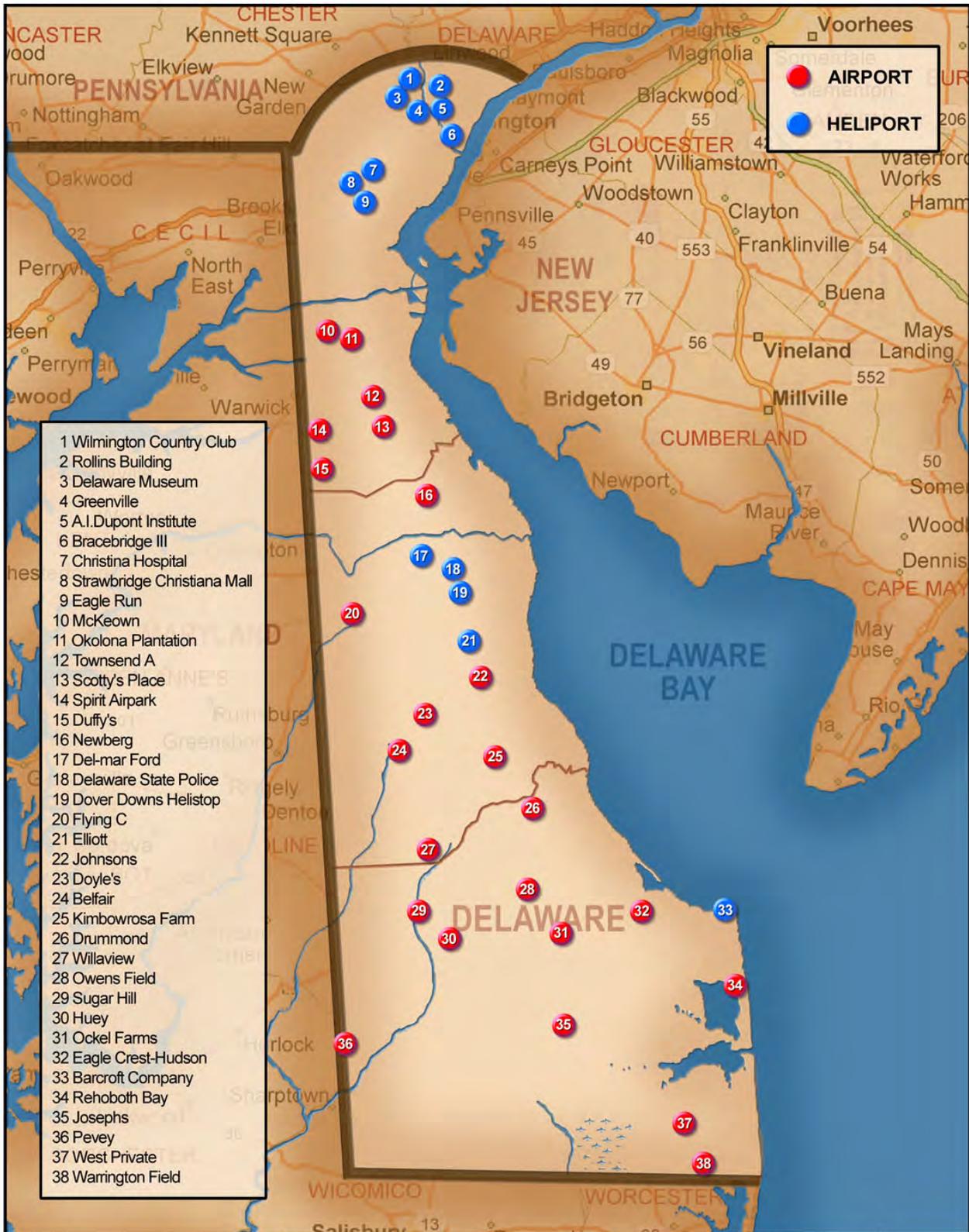
Number	Name	FAA Code	Facility Type	Description	County	Directions	Owner
12	Townsend A	DE34	Airport	3,300' x 100' Turf	New Castle	2 miles southwest of Townsend, DE at 3681 Harris Road 19734	John A. Moritz
13	Scotty's Place	DE29	Airport	2,600' x 80' Turf	Kent	5 miles south of Smyrna, DE at 325 Gum Bush Rd. Townsend 19734	Scott W. Powell
14	Spirit Airpark	DE20	Airport	3,300' x 100' Turf	New Castle	3 miles southwest of Townsend, DE at 1270 Caldwell Corner Rd 19734	David & Nancy Cannavo
15	Duffy's	DE19	Airport	2,600' x 60' Turf	New Castle	6 miles southwest of Townsend, DE off Sawmill Rd on Airport PI	Gene J Duffy
16	Newberg	DE04	Airport	1,000' x 50' Turf	Kent	2 miles east of Smyrna, DE at Smyrna Leipsic Rd. and Big Oak Rd. 19977	Kenneth Newburg
17	Del-mar Ford	DE22	Heliport	100' x 100' Turf	Kent	1 mile east of Cheswold at the intersection of Commerce St. and School Lane, 19901	Del-mar Ford Tractor Inc
18	Delaware State Police	DE02	Heliport	60' x 60' Concrete	Kent	On Leipsic Rd past Marley Ln, Dover 19903	Delaware State Police
19	Dover Downs Helistop	DE03	Heliport	300' x 300' Turf	Kent	1 mile north of Dover, on Leipsic Rd across from Dover International Speedway, 19903	Dover Downs
20	Flying C	DE07	Airport	2,300' x 150' Turf	Kent	2 miles southeast of Hartly, DE on Judith Rd. before Hourglass Rd	Charles R. Sears, Sr.

Table A-1 - Privately Owned, Private-Use Airports and Heliports

Number	Name	FAA Code	Facility Type	Description	County	Directions	Owner
21	Elliott	DE24	Heliport	50' x 50' Turf	Kent	2 miles south of Dover, on Sorghum Mill Rd past Doty Dr., 19901	Brett Elliott
22	Johnsons	DE09	Airport	2,243' x 80' Turf	Kent	1 mile west of Magnolia, DE on Irish Hill Rd past West Walnut St.	Al Johnson, Jr.
23	Doyle's	DE00	Airport	2,000' x 50' Turf	Kent	1 miles north of Felton, DE at 1029 Peach Basket Rd. Felton, DE 19943	David & Catherine Doyle
24	Belfair	DE32	Airport	2,335' x 50' Turf	Kent	3 miles southwest of Felton, DE on Hopkins Cemetery Rd before Hills Market Rd	Robert M and Jayne H Bennett
25	Kimbowrosa Farm	DE10	Airport	1,750' x 50' Turf	Kent	3 miles northwest of Milford, DE off Blue Jay Ln. 19963	William P. Bowman
26	Drummond	DE11	Airport	1,650' x 50' Turf	Sussex	1 mile southeast of Milford, DE on Kirby Rd	William Douglass Drummond
27	Willaview	2DE2	Airport	2,400 x 75' Turf	Kent	1 mile southeast of Farmington, DE at 21733 S. Dupont Highway Greenwood 19950	Daniel E. Williams III
28	Owens Field	DE12	Airport	2,000' x 172' Turf	Sussex	Ellendale, DE on Milton Ellendale Hwy	James H. Owens
29	Sugar Hill	DE17	Airport	2,300' x 100' Turf	Sussex	2 miles southeast of Greenwood, DE on Sugar Hill Rd	Robert Hunsberger
30	Huey	DE14	Airport	2,600' x 110' Turf	Sussex	4 miles east of Bridgeville DE on Deer Forest Rd	Gene H. Huey
31	Ockel Farms	DE23	Airport	2,500' x 100' Turf	Sussex	3 miles southwest of Milton, DE on E Redden Rd	Dale Ockels

Table A-1 - Privately Owned, Private-Use Airports and Heliports

Number	Name	FAA Code	Facility Type	Description	County	Directions	Owner
32	Eagle Crest-hudson	DE25	Airport	3,500' x 100' Turf	Sussex	4 miles east of Milton, DE on Costal Hwy S	Joseph R. Hudson
33	Barcroft Company	DE08	Heliport	60' x 40' Turf	Sussex	1 mile east of Lewes, DE on Cape Henlopen Dr	Barcroft Company
34	Rehoboth Bay	DE13	Airport	5,000' x 250' Water	Sussex	Rehoboth bay at Dewey Beach off Venetian Dr.	Rehoboth Seaplane
35	Josephs	DE49	Airport	4,564' x 60' Asphalt	Sussex	3 miles south of Georgtown, DE on Dupont Blvd S	Melvin L. Joseph Const. Co.
36	Pevey	DE15	Airport	2,600 x 75' Turf	Sussex	5 miles southwest of Seaford, DE off Woodpecker Rd	Ronald & Linda Pevey
37	West Private	DE21	Airport	3,000' x 65' Turf	Sussex	4 miles E of Frankford, DE on Daisey Rd	Richard E. West
38	Warrington Field	DE27	Airport	2,099' x 80' 2,180' x 94' Turf	Sussex	Selbyville, DE off Lighthouse RD 19975	Manaen Warrington



R.A. Wiedemann &
Associates, Inc.
AVIATION CONSULTANTS

Delaware State Aviation System Plan Update

**PRIVATE-USE
AIRPORTS AND HELIPORTS**

Figure
A-1

Appendix 2-B:
Delaware Aeronautics Legislation



[§ 101.](#) | [§ 102.](#) | [§ 103.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 1. REGULATION

Subchapter I. General Provisions

§ 101. Purpose of chapter.

The purpose of this chapter is to further the public interest and aeronautical progress by providing for the protection and promotion of safety in aeronautics; by cooperating in effecting a uniformity of the laws relating to the development and regulation of aeronautics in the several states; by granting to a state agency such powers and imposing upon it such duties that the State may properly perform its functions relative to aeronautics and effectively exercise its jurisdiction over persons and property within such jurisdiction, may assist in the promotion of a statewide system of airports, may cooperate with and assist the political subdivisions of this State and others engaged in aeronautics, and may encourage and develop aeronautics; by establishing uniform regulations, consistent with federal regulations and those of other states, in order that those engaged in aeronautics of every character may so engage with the least possible restriction, consistent with the safety and the rights of others; and by providing for cooperation with the federal authorities in the development of a national system of civil aviation and for coordination of the aeronautical activities of those authorities and the authorities of this State by assisting in accomplishing the purposes of federal legislation and eliminating costly and unnecessary duplication of functions properly in the province of federal agencies. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 2; 2 Del. C. 1953, § 101.)

§ 102. Definitions.

For the purpose of this part or any other laws of this State relating to aeronautics, unless otherwise specifically defined, or unless another intention clearly appears or the context requires a different meaning:

(1) "Aeronautics" or "Aviation" means transportation by aircraft; the operation, construction, repair, or maintenance of aircraft, aircraft power plants and accessories, including the repair, packing, and maintenance of parachutes; the design, establishment, construction, extension, operation, improvement, repair, or maintenance of airports, restricted landing areas, or other air navigation facilities, and air instruction.

(2) "Aeronautics instructor" means any individual engaged in giving instruction, or

offering to give instruction, in aeronautics, either in flying or ground subjects, or both, for hire or reward, without advertising such occupation, without calling the facilities an "air school" or anything equivalent thereto, and without employing or using other instructors; but it does not include any instructor in any public school or university of this State, or any institution of higher learning duly accredited and approved for carrying on collegiate work, while engaged in the duties as such instructor.

(3) "Air instruction" means the imparting of aeronautical information by any aeronautics instructor or in or by any air school or flying club.

(4) "Air navigation" means the operation or navigation of aircraft in the air space over this State, or upon any airport or restricted landing area within this State.

(5) "Air navigation facility" means any facility other than one owned or controlled by the federal government, used in, available for use in, or designed for use in, aid of air navigation, including airports, restricted landing areas, and any structures, mechanisms, lights, beacons, marks, communicating systems, or other instrumentalities or devices used or useful as an aid, or constituting an advantage or convenience, to the safe taking-off, navigation, and landing of aircraft, or the safe and efficient operation or maintenance of an airport or restricted landing area, and any combination of any or all of such facilities.

(6) "Air school" means any person engaged in giving, or offering to give, instruction, in aeronautics, either in flying or ground subjects, or both, for or without hire or reward, and advertising, representing, or holding himself or herself out as giving or offering to give such instruction; but it does not include any public school or university of this State, or any institution of higher learning duly accredited and approved for carrying on collegiate work.

(7) "Aircraft" means any contrivance known, or invented, used or designed for navigation of or flight in the air.

(8) "Airman" means any individual who engages, as the person in command, or as pilot, mechanic, or member of the crew, in the navigation of aircraft while under way; and (excepting individuals employed outside the United States, any individual employed by a manufacturer of aircraft, aircraft engines, propellers, or appliances to perform duties as inspector or mechanic in connection therewith, and any individual performing inspection or mechanical duties in connection with aircraft owned or operated by such individual) any individual who is directly in charge of the inspection, maintenance, overhauling, or repair of aircraft engines, propellers, or appliances; and any individual who serves in the capacity of aircraft dispatcher or air-traffic control-tower operator.

(9) "Airport" means any area, of land or water, except a restricted landing area, which is designed for the landing and takeoff of aircraft, whether or not facilities are provided for the shelter, servicing, or repair of aircraft, or for receiving or discharging passengers or cargo, and all appurtenant areas used or suitable for airport buildings or other airport facilities, and all appurtenant rights-of-way.

(10) "Airport approach area" means all that area lying within and below an inclined plane as defined in Federal Aviation Regulation (FAR) Part 77.

(11) "Airport hazard" means any structure, object of natural growth, or use of land, which obstructs the air space required for the flight of aircraft in landing or taking off at any airport or restricted landing area or is otherwise hazardous to such landing or taking off.

(12) "Airport protection privileges" means easements through or other interests in air space over land or water, interests in airport hazards outside the boundaries of airports or restricted landing areas, and other protection privileges, the acquisition or control of which is necessary to insure safe approaches to the landing areas of airports and restricted landing areas and the safe and efficient operation thereof.

(13) "Airport purposes" means and includes airport, restricted landing area, and other air navigation facility purposes.

(14) "Civil aircraft" means any aircraft other than a public aircraft.

(15) "Department" means the Department of Transportation.

(16) "Flying club" means any person other than an individual, which, neither for profit nor reward, owns, leases or uses 1 or more aircraft for the purpose of instruction or pleasure or both.

(17) "Helicopter landing site" means a heliport, helistop or helipad or any other surface used or usable for helicopter operations as defined in FAR Part 77.

(18) "Municipality" means any "political subdivision," as defined in this section.

(19) "Navigable air space" means air space above the minimum altitudes of flight prescribed by the laws of this State or by regulations of the Department consistent therewith.

(20) "Obstruction" means any physical hazard to flight constructed, installed or planted by humans, whether real or artificial, including, but not limited to, buildings, trees, towers, smokestacks and overhead transmission lines.

(21) "Operation of aircraft" or "operate aircraft" means the use of aircraft for the purpose of air navigation, and includes the navigation or piloting of aircraft.

(22) "Person" or "whoever" means any individual, firm, partnership, corporation, company, association, joint stock association or body politic; and includes any trustee, receiver, assignee or other similar representative thereof.

(23) "Political subdivision" means any county, hundred, city, village, town or borough of this State and any other public corporation, authority or district in this State authorized by law to acquire, establish, construct, maintain, improve and operate airports and other air navigation facilities.

(24) "Public aircraft" means an aircraft used exclusively in the service of any government or of any political subdivision thereof, including the government of any state, territory or possession of the United States or the District of Columbia, but not including any government-owned aircraft engaged in carrying persons or property for commercial purposes.

(25) "Public use airport" means an airport open for use by the public for general aviation purposes.

(26) "Restricted landing area" means any area of land, water or both which is used or is made available for the landing and takeoff of aircraft, the use of which shall, except in

case of emergency, be only as provided from time to time by the Department.

(27) "Runway approach area" means an imaginary trapezoidal shape, beginning at the end of a runway with an initial width parallel to the runway end extending for a distance of 500 feet from each side of the runway centerline, running lengthwise from the runway end along said centerline for a distance of 3000 feet and ending with a line parallel to the runway end extending for a distance of 875 feet from each side of said runway centerline, pursuant to FAA Advisory Circular 150/5300-13.

(28) "Secretary" means the Secretary of Transportation.

(29) "State airway" means a route in the navigable air space over and above the lands or water of this State, designated by the Department as a route suitable for air navigation. (36 Del. Laws, c. 249, § 1; Code 1935, § 5764; 45 Del. Laws, c. 300, § 1; 45 Del. Laws, c. 301, § 1; 2 Del. C. 1953, § 102; 56 Del. Laws, c. 268, § 3; 57 Del. Laws, c. 671, §§ 11A, B; 60 Del. Laws, c. 503, § 25; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 1; 74 Del. Laws, c. 201, § 1.)

§ 103. Delaware Aviation Advisory Council.

In accordance with the intent and purpose of this chapter, as set forth therein, the Department is authorized to appoint and select members of a Delaware Aviation Advisory Council (DAAC), to assist the Department in furthering and promoting the interests of aviation in Delaware, as defined by Part I of this title. The Delaware Aviation Advisory Council shall serve in an advisory capacity and in that role shall have such power and authority as may be granted by the Secretary to recommend measures consistent with the intent and purposes set forth in this chapter. Such measures may include but are not limited to: supporting the Department in the planning and implementation of aviation system enhancements; supporting and promoting aviation education; recommending new or improvements to existing locations, facilities, programs, projects, equipment; and recommending other related activities to support and improve aviation. The Delaware Aviation Advisory Council shall consist of 9 members, which shall include at the least 1 representative from each of the following:

1. A Fixed Base Operator (FBO);
2. The Delaware River & Bay Authority (DRBA);
3. An aviation education representative;
4. A representative from corporate aviation;
5. One representative each from New Castle, Kent and Sussex Counties; and
6. Two at large members selected by the Secretary. (74 Del. Laws, c. 201, § 2.)

NOTICE: The Delaware Code appearing on this site was prepared by the Division of Research of Legislative Council of the General Assembly with the assistance of the Government Information Center, under the supervision of the Delaware Code Revisors and the editorial staff of LexisNexis, includes all acts up to and including 75 Del. Laws, c. 73, effective June 28, 2005. In addition, this update includes all material from 75 Del. Laws, c. 78-83, 89-100, 107, 109, 111, 113, 117, 131 and 137.

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[§ 131.](#) | [§ 132.](#) | [§ 133.](#) | [§ 134.](#) | [§ 135.](#) | [§ 136.](#) | [§ 137.](#) | [§ 138.](#) | [§ 139.](#) | [§ 140.](#) | [§ 141.](#) | [§ 142.](#) | [§ 143.](#) | [§ 144.](#) | [§ 145.](#) | [§ 146.](#) | [§ 147.](#) | [§ 148.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 1. REGULATION

Subchapter II. Department of Transportation; Powers and Duties

§ 131. General powers and duties.

The Department shall have general supervision over aeronautics within this State. It shall encourage, foster, and assist in the development of aeronautics in this State and encourage the establishment of airports and other air navigation facilities. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(1); 2 Del. C. 1953, § 131; 57 Del. Laws, c. 671, § 11D.)

§ 132. Coordination of aeronautics matters and activities with and between the federal government, political subdivisions and others.

The Department shall cooperate with and assist the federal government, the political subdivisions of this State and others engaged in aeronautics or the promotion of aeronautics, and shall seek to coordinate the aeronautical activities of these bodies. To this end, the Department may confer with or hold joint hearings with any federal aeronautical agency in connection with any matter arising under this chapter or relating to the sound development of aeronautics, and may avail itself of the cooperation, services, records and facilities of such federal agencies, as fully as may be practicable, in the administration and enforcement of this chapter. It shall reciprocate by furnishing to the federal agencies its cooperation, services, records and facilities, insofar as may be practicable. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(2); 2 Del. C. 1953, § 132; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 2.)

§ 133. Reports to federal agencies; preservation of aircraft involved in accidents.

The Federal Aviation Administration has primary responsibility for investigating aircraft accidents. Initial reports of accidents may be directed by state and/or local police agencies that report such aeronautical accident information to the Department through the Office of Aeronautics. The Office of Aeronautics shall report to the appropriate federal agency all aeronautical accidents of which it is informed and shall cooperate with and assist federal agencies in the conduct of any investigation. Police agencies involved in any accident investigation shall preserve, protect and prevent removal of component parts of any aircraft involved in an accident until the investigating agency or Office of Aeronautics gives

clearance for removal of the wreckage. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6 (2); 2 Del. C. 1953, § 133; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 3.)

§ 134. Rules, regulations, and standards.

(a) The Department may perform such acts, issue and amend such orders, and make, promulgate, and amend such reasonable general or special rules, regulations, and procedure, and establish such minimum standards, consistent with this chapter, as it deems necessary to carry out the provisions of this chapter and to perform its duties hereunder; all commensurate with and for the purpose of protecting and insuring the general public interest and safety, the safety of persons receiving instruction concerning, or operating, using or traveling in aircraft, and of persons and property on land or water, and to develop and promote aeronautics in this State.

(b) No rule or regulation of the Department shall apply to airports or other air navigation facilities owned or controlled by the federal government within this State.

(c) Rules, regulations and standards for aeronautics are published by the United States Department of Transportation, Federal Aviation Administration. These regulations, as amended from time to time, have nationwide jurisdiction and shall govern all aeronautics in this State, except where the laws of this State provide additional protection.

(d) The Department shall keep on file with the Secretary of State, and at the principal office of the Department, a copy of all its rules and regulations, for public inspection. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(3)-(5); 2 Del. C. 1953, § 134; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 4.)

§ 135. State airways system.

The Department may designate, design, and establish, expand, or modify a state airways system which will best serve the interests of the State. It may chart such airways system and arrange for publication and distribution of such maps and charts and notices and bulletins relating to such airways as may be required in the public interest. The system shall be supplementary to and coordinated in design and operation with the federal airways system. It may include all types of air navigation facilities, whether publicly or privately owned, if such facilities conform to federal safety standards. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(6); 2 Del. C. 1953, § 135; 57 Del. Laws, c. 671, § 11D.)

§ 136. Technical services to public use airports and political subdivisions.

The Department may, insofar as is reasonably possible, offer its technical services and advice to any political subdivision or public use airport desiring those services in connection with the actual or proposed construction, maintenance or operation of an airport. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(7); 2 Del. C. 1953, § 136; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 5.)

§ 137. Legislation; representation of State before federal agencies.

The Department may draft and recommend necessary legislation to advance the interest of the State in aeronautics and represent the State in aeronautical matters before federal agencies and other state agencies. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(8); 2 Del. C. 1953, § 137; 57 Del. Laws, c. 671, § 11D.)

§ 138. Participation in litigation or other proceedings.

The Department may participate as party plaintiff or defendant, or as intervenor on behalf of the State or any political subdivision or citizen thereof in any controversy having to do with any claimed encroachment by the federal government or any foreign state upon any state or individual rights pertaining to aeronautics. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(9); 2 Del. C. 1953, § 138; 57 Del. Laws, c. 671, § 11D.)

§ 139. Enforcement of aeronautics laws.

The Department, its members and employees, the Secretary of Transportation, and every state, county and municipal officer charged with the enforcement of state and municipal laws shall enforce and assist in the enforcement of this chapter and of all rules and regulations issued under this chapter, and of all other laws of this State relating to aeronautics, and, in the aid of such enforcement, general police powers are conferred upon the Department, each of its members, the Secretary of Transportation, and such of the officers and employees of the Department designated by it to exercise such powers. Further, the Department may, in the name of this State, enforce this chapter and the rules and regulations issued under this chapter by injunction in the courts of this State. Political subdivisions may cooperate with the Department in the development of aeronautics and aeronautics facilities in this State. The Department may use the facilities and services of other agencies of the State to the utmost extent possible, and such agencies shall make available such facilities and services. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(10); 2 Del. C. 1953, § 139; 57 Del. Laws, c. 671, §§ 11D, E; 60 Del. Laws, c. 503, § 25.)

§ 140. Conduct of investigations, inquiries and hearings.

The Department, any member thereof, the Secretary of Transportation, or any officer or employee of the Department designated by it may hold investigations, inquiries and hearings concerning matters covered by the provisions of this chapter and orders, rules and regulations of the Department, and concerning accidents in aeronautics within this State. All hearings so conducted shall be open to the public. The Secretary of Transportation, and every officer or employee of the Department designated by it to hold any inquiry, investigations or hearing may administer oaths and affirmations, certify to all official acts, issue subpoenas and compel the attendance and testimony of witnesses and the production of papers, books and documents. In case of failure to comply with any subpoena or order issued under authority of this chapter, the Department, or its authorized representative, may invoke the aid of any court of this State of general jurisdiction. The court may thereupon order the witness to comply with the requirements of the subpoena or order or to give evidence touching the matter in question. Any failure to obey the order of the court may be punished by the court as a contempt thereof. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(11); 2 Del. C. 1953, § 140; 57 Del. Laws, c. 671, §§ 11D-F; 60 Del. Laws, c. 503, § 25.)

§ 141. Reports of investigations.

In order to facilitate the making of investigations by the Department, in the interest of public safety and promotion of aeronautics, the public interest requires, and it is, therefore, provided that the reports of investigations or hearings, or any part thereof, shall not be admitted in evidence or used for any purpose in any suit, action or proceeding, growing out of any matter referred to in the investigation, hearing or report thereof, except in case of criminal or other proceedings instituted in behalf of the Department or this State under the provisions of this chapter and other laws of this State relating to aeronautics, nor shall the Secretary of Transportation, or any officer or employee of the Department be required to testify to any facts ascertained in, or information gained by reason of, his official capacity, or be required to testify as an expert witness in any suit, action or proceeding involving any aircraft. Subject to the foregoing provisions, the Department may make available to

appropriate federal and state agencies information and material developed in the course of its hearings and investigations. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(12); 2 Del. C. 1953, § 141; 57 Del. Laws, c. 671, §§ 11D, E, G; 60 Del. Laws, c. 503, § 25.)

§ 142. Financial assistance to political subdivisions, public use airports and education programs.

The Department may, through the Office of Aeronautics, render assistance in the acquisition, development, operation or maintenance of airports and aviation projects of political subdivisions and public use airports and in the provision of training for formal educational programs from funds generated through fees, taxes and other sources applicable to aeronautics and administered by the Office of Aeronautics. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(13); 2 Del. C. 1953, § 142; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 6.)

§ 143. Authority to contract.

The Department may enter into any contracts necessary to the execution of the powers granted it by this chapter. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(14); 2 Del. C. 1953, § 143; 57 Del. Laws, c. 671, § 11D.)

§ 144. Grant of exclusive rights prohibited.

The Department shall grant no exclusive right for the use of any airway, airport, restricted landing area, or other air navigation facility under its jurisdiction. This section shall not prevent the making of leases in accordance with other provisions of this chapter. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6(15); 2 Del. C. 1953, § 144; 57 Del. Laws, c. 671, § 11D.)

§ 145. Cooperation with federal government.

The Department may cooperate with the government of the United States, and any agency or department thereof, in the acquisition, construction, improvement, maintenance and operation of airports and other air navigation facilities in this State, and may comply with the provisions of the laws of the United States and any regulations made thereunder for the expenditure of federal moneys upon such airports and other navigation facilities. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 7(1); 2 Del. C. 1953, § 145; 57 Del. Laws, c. 671, § 11D.)

§ 146. Receipt of federal moneys for airports.

The Department may accept, receive, and receipt for federal moneys and other moneys, either public or private, for and in behalf of this State, or any political subdivision, for the acquisition, construction, improvement, maintenance, and operation of airports and other air navigation facilities, whether such work is to be done by the State or by such political subdivisions, or jointly, aided by grants of aid from the United States, upon terms and conditions prescribed by the laws of the United States and any rules or regulations made thereunder. The Department may act as agent of any political subdivision upon the request of such political subdivision, in accepting, receiving, and receipting for such moneys in its behalf for airports or other air navigation facility purposes, and in contracting for the acquisition, construction, improvement, maintenance, or operation of airports or other air navigation facilities, financed either in whole or in part by federal moneys. The governing body of any such political subdivision may designate the Department as its agent for such purposes and enter into an agreement with it prescribing the terms and conditions of such

agency in accordance with federal laws, rules, and regulations and with this chapter. All moneys so paid over by the United States government shall be retained by the State or paid over to the political subdivision under terms and conditions imposed by the United States government in making such grants. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 7 (2); 2 Del. C. 1953, § 146; 57 Del. Laws, c. 671, § 11D.)

§ 147. Disposition of federal moneys for airports.

All moneys accepted for disbursement by the Department under § 146 of this title shall be deposited in the State Treasury, and, unless otherwise prescribed by the authority from which the money is received, kept in separate funds, designated according to the purposes for which the moneys were made available, and held by the State in trust for such purposes. All such moneys are appropriated for the purposes for which the same were made available, to be expended in accordance with federal laws and regulations and with this chapter. The Department may, whether acting for this State or as the agent of any political subdivision, or when requested by the United States government or any agency or department thereof, disburse such moneys for the designated purposes, but this shall not preclude any other authorized method of disbursement. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 7(4); 2 Del. C. 1953, § 147; 57 Del. Laws, c. 671, § 11D.)

§ 148. Contracts for air navigation facilities.

All contracts for the acquisition, construction, improvement, maintenance, and operation of airports, or other air navigation facilities made by the Department, either as the agent of this State or as the agent of any political subdivision, shall be made under the laws of this State governing the making of like contracts. Where the acquisition, construction, improvement, maintenance, and operation of any airport, landing strip, or other air navigation facility is financed wholly or partially with federal moneys, the Department, as agent of the State or of any municipality thereof, may let contracts in the manner prescribed by the federal authorities, acting under the laws of the United States, and any rules or regulations made thereunder, notwithstanding any other state law to the contrary. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 7(3); 2 Del. C. 1953, § 148; 57 Del. Laws, c. 671, § 11D.)

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[§ 161.](#) | [§ 162.](#) | [§ 163.](#) | [§ 170.](#) | [§ 171.](#) | [§ 172.](#) | [§ 173.](#) | [§ 174.](#) | [§ 175.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 1. REGULATION

Subchapter III. Registration and Licenses

§ 161. Declaration of policy.

(a) The Federal Aviation Regulations (promulgated by the Federal Aviation Administration pursuant to Part A of Subtitle VII of Title 49 of the United States Code, as amended) prescribe uniform rules and regulations pertaining to aviation. These regulations, as may be amended, are hereby adopted as the aeronautics regulations of the State. They shall be augmented and supplemented as necessary to regulate matters peculiar to this State.

(b) When authorized by the General Assembly, the Department of Transportation shall procure and operate transport-type aircraft to satisfy the needs of the State. Other state agencies may own and operate specialized light planes and helicopters required for special needs such as police work. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(1); 2 Del. C. 1953, § 161; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 7.)

§ 162. Airports, landing areas and other air navigation facilities.

The Department, through the Office of Aeronautics, may approve and license airports and helicopter landing sites or other air navigation facilities in accordance with regulations it adopts pertaining to such approval and licensure. Licenses granted under this section shall be renewed annually in conjunction with the Federal Aviation Administration sponsored airport survey program. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(1); 2 Del. C. 1953, § 164; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 8.)

§ 163. Refusal and revocation of license; registration or approval.

The Department, through the Office of Aeronautics, may suspend or revoke any certificate of approval or license issued by it when it determines that an airport, restricted landing area or other navigation facility is not being maintained or used in accordance with the provisions of this chapter and the rules and regulations lawfully promulgated by it pursuant thereto. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(1), (10); 2 Del. C. 1953, § 165; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 8.)

77 164, 165. reserved. |.

77 166-169. reserved. |.

§ 170. Operation of airport, landing area, etc. without license; approval of site required before acquisition.

(a) All proposed airports, restricted landing areas, and other air navigation facilities shall be first licensed by the Department before they, or any of them, shall be used or operated.

(b) Any political subdivision or person acquiring property for the purpose of constructing or establishing an airport or restricted landing area shall, prior to the acquisition, make application to the Department for a certificate of approval of the site selected and the general purpose or purposes for which the property is to be acquired, to insure that the property and its use shall conform to minimum standards of safety and shall serve public interest.

(c) No political subdivision or officer or employer thereof, or person, shall operate an airport, restricted landing area, or other air navigation facility unless an annual license therefor has been issued by the Department. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9 (6); 2 Del. C. 1953, § 170; 57 Del. Laws, c. 671, § 11D.)

§ 171. Hearings for approval of airport sites or for licensing airports.

Whenever the Department makes an order granting or denying a certificate of approval of an airport or a restricted landing area site, or an original license to use or operate an airport, restricted landing area or other air navigation facility, and the applicant or any interested political subdivision, within 15 days after notice of such order has been sent to the applicant by registered mail, demands a public hearing, or whenever the Department desires to hold a public hearing before making an order, such a public hearing in relation thereto shall be held in the political subdivision applying for the certificate of approval or license, or in case the application was made by anyone other than a political subdivision, at the county seat of the county in which the proposed airport, restricted landing area or other air navigation facility is proposed to be situated, at which hearing parties in interest and other persons shall have an opportunity to be heard. Notice of the hearing shall be published, at least twice, by the Department in a legal newspaper of general circulation in the county in which the hearing is to be held, the first publication to be at least 15 days prior to the date of hearing. After a proper and timely demand has been made the order shall be stayed until after the hearing, when the Department may affirm, modify or reverse it, or make a new order. If no hearing is demanded as herein provided, the order shall become effective upon the expiration of the time permitted for making a demand. Where a certificate of approval of an airport or restricted landing area site has been issued by the Department, it may grant a license for operation and use, and no hearing shall be demanded thereon. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(7); 2 Del. C. 1953, § 171; 57 Del. Laws, c. 671, § 11D.)

§ 172. Standards for approving airport sites and licensing airports.

In determining whether it shall issue a certificate of approval of a site or license for the use or operation of any proposed airport or restricted landing area, the Department shall take into consideration its proposed location, size and layout, the relationship of the proposed airport or restricted landing area to a comprehensive plan for statewide and nationwide development, whether there are safe areas available for expansion purposes, whether the adjoining area is free from obstructions based on a proper glide ratio, the

nature of the terrain, the nature of the uses to which the proposed airport or restricted landing area will be put, and the possibilities for future development. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(8); 2 Del. C. 1953, § 172; 57 Del. Laws, c. 671, § 11D.)

§ 173. Exceptions from approval and licensing requirements.

Sections 170 through 172 inclusive of this title shall not apply to restricted landing areas designed for personal use or to any airport, restricted landing area or other air navigation facility owned or operated by the federal government within this State. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(9), (11); 2 Del. C. 1953, § 173.)

§ 174. Orders of Department refusing or revoking license, registration or approval.

In any case where the Department refuses to issue a certificate of approval of or license or renewal of license for an airport, restricted landing area or other air navigation facility, or refuses to permit the registration of any license, certificate or permit, or refuses to grant a license to an air school or to an aeronautics instructor in ground subjects, or in any case where it issues any order requiring certain things to be done, or revoking any license or certificate, it shall set forth its reasons therefor and shall state the requirements to be met before such approval will be given, registration permitted, license granted or order modified or changed. Any order made by the Department under this chapter shall be served upon the interested persons by registered mail or in person. To carry out this chapter the Department, any member thereof, the Secretary of Transportation or officers or employees of the Department and any officers, state or municipal, charged with the duty of enforcing this chapter may inspect and examine at reasonable hours any premises, and the buildings and other structures thereon, where airports, restricted landing areas, air schools, flying clubs or other air navigation facilities or aeronautical activities are operated or carried on. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 10(1); 2 Del. C. 1953, § 174; 57 Del. Laws, c. 671, §§ 11D, E; 60 Del. Laws, c. 503, § 25.)

§ 175. Review of Department's action.

Any person aggrieved by an order of the Department, or by the granting or denial of any license, certificate, or registration may have the action of the Department reviewed by the Superior Court in the manner provided for the review of the orders of other administrative bodies of the State, and the rules of law applicable to such reviews shall apply. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 10(2); 2 Del. C. 1953, § 175; 57 Del. Laws, c. 671, § 11D.)

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§ 181.

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 1. REGULATION

Subchapter IV. Penalties

§ 181. Penalties.

Whoever violates this chapter or any of the rules, regulations, or orders issued pursuant thereto shall be fined not more than \$1,000 or imprisoned not more than 1 year, or both. (Code 1935 c. 167; 45 Del. Laws, c. 301, § 13; 2 Del. C. 1953, § 181.)

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[§ 301.](#) | [§ 302.](#) | [§ 303.](#) | [§ 304.](#) | [§ 305.](#) | [§ 306.](#) | [§ 307.](#) | [§ 308.](#) | [§ 309.](#) | [§ 310.](#) | [§ 311.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 3. UNIFORM STATE AERONAUTICS LAW

§ 301. Definitions.

When used in this chapter:

(1) "Airperson" includes aviator, pilot, balloonist and every other person having any part in the operation of aircraft while in flight.

(2) "Aircraft" includes balloon, airplane, hydroplane and every other vehicle used for navigation through the air. However, a hydroplane, while at rest on water and while being operated on or immediately above water, shall be governed by the rules regarding water navigation; but while being operated through the air otherwise than immediately above water, it shall be treated as an aircraft.

(3) "Passenger" includes any person riding in an aircraft but having no part in its operation. (33 Del. Laws, c. 199, § 1; Code 1935, § 5776; 2 Del. C. 1953, § 301; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 13.)

§ 302. Sovereignty in space.

Sovereignty in the space above the lands and waters of this State rests in the State, except where granted to and assumed by the United States pursuant to a constitutional grant from the people of this State. (33 Del. Laws, c. 199, § 2; Code 1935, § 5777; 2 Del. C. 1953, § 302.)

§ 303. Ownership of space.

The ownership of space above the lands and waters of this State is vested in the several owners of the surface beneath, subject to the right of flight described in § 304 of this title. (33 Del. Laws, c. 199, § 3; Code 1935, § 5778; 2 Del. C. 1953, § 303.)

§ 304. Lawfulness of flight and landings.

Flight in aircraft over the lands and waters of this State is lawful, unless at such a low altitude as to interfere with the then existing use to which the land or water, or the space

over the land or water, is put by the owner, or unless so conducted as to be imminently dangerous to persons or property lawfully on the land or water beneath.

No person shall land an aircraft on the lands or waters of another, without the owner's consent, except in the case of a forced landing. For damages caused by a forced landing, however, the owner or lessee of the aircraft or the airperson shall be liable, as provided in § 305 of this title. (33 Del. Laws, c. 199, § 4; Code 1935, § 5779; 2 Del. C. 1953, § 304; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 13.)

§ 305. Damage on land; liability.

The owner of every aircraft which is operated over the lands or waters of this State is absolutely liable for injuries to persons or property on the land or water beneath, caused by the ascent, descent or flight of the aircraft, or the dropping or falling of any object therefrom, whether such owner was negligent or not, unless the injury is caused in whole or in part by the negligence of the person injured, or of the owner or bailee of the property injured. If the aircraft is leased at the time of the injury to person or property, both owner and lessee shall be liable, and they may be sued jointly, or either or both of them may be sued separately. An airman who is not the owner or lessee shall be liable only for the consequences of the airman's own negligence. The injured person, or owner or bailee of the injured property, shall have a lien on the aircraft causing the injury to the extent of the damage caused by the aircraft or objects falling from it. (33 Del. Laws, c. 199, § 5; Code 1935, § 5780; 2 Del. C. 1953, § 305; 70 Del. Laws, c. 186, § 1.)

§ 306. Collision of aircraft; law governing liability.

The liability of the owner of 1 aircraft to the owner of another aircraft, or to airpersons or passengers on either aircraft, for damage caused by collision on land or in the air, shall be determined by the rules of law applicable to torts on land. (33 Del. Laws, c. 199, § 6; Code 1935, § 5781; 2 Del. C. 1953, § 306; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 14.)

§ 307. Crimes and torts in flight; law governing.

All crimes, torts and other wrongs committed by or against an airperson or passenger while in flight over this State shall be governed by the laws of this State; and the question whether damage occasioned by or to an aircraft while in flight over this State constitutes a tort, crime or other wrong by or against the owner of such aircraft, shall be determined by the laws of this State. (33 Del. Laws, c. 199, § 7; Code 1935, § 5782; 2 Del. C. 1953, § 307; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 13.)

§ 308. Contracts in flight.

All contractual and other legal relations entered into by aeronauts or passengers while in flight over this State shall have the same effect as if entered into on the land or water beneath. (33 Del. Laws, c. 199, § 8; Code 1935, § 5783; 2 Del. C. 1953, § 308.)

§ 309. Dangerous flying; penalty.

Whoever, being an airperson or passenger, while in flight over a thickly inhabited area or over a public gathering within this State, engages in trick or acrobatic flying, or in any acrobatic feat, or, except while in landing or taking off, flies at such a low level as to endanger the persons on the surface beneath, or drops any object except loose water or loose sand ballast, shall be fined not more than \$500 or imprisoned not more than 1 year,

or both. (33 Del. Laws, c. 199, § 9; Code 1935, § 5784; 2 Del. C. 1953, § 309; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 13.)

§ 310. Hunting from aircraft; penalty.

Whoever, being an airperson or passenger, while in flight within this State, intentionally kills or attempts to kill any birds or animals, shall be fined not more than \$100 or imprisoned not more than 6 months, or both. (33 Del. Laws, c. 199, § 10; Code 1935, § 5785; 2 Del. C. 1953, § 310; 70 Del. Laws, c. 186, § 1; 70 Del. Laws, c. 575, § 13.)

§ 311. Uniformity of interpretation.

This chapter shall be so interpreted and construed as to effectuate its general purpose to make uniform the law of those states which enact it, and to harmonize, as far as possible, with federal laws and regulations on the subject of aeronautics. (33 Del. Laws, c. 199, § 11; Code 1935, § 5786; 2 Del. C. 1953, § 311.)

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[§ 501.](#) | [§ 502.](#) | [§ 503.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 5. AIRCRAFT OPERATION

§ 501. Adoption of Federal Aviation Regulations governing aircraft operations.

The federal government has enacted laws (Part A of Subtitle VII of Title 49 of the United States Code, as amended) and promulgated regulations concerning the operation of aircraft. The rules and regulations governing aviation are published in the Federal Aviation Regulations issued by the Federal Aviation Administration of the U.S. Department of Transportation. These regulations, as published and as subsequently amended, are hereby accepted and adopted as the laws of Delaware governing aircraft operation. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 1(11); 2 Del. C. 1953, § 501; 70 Del. Laws, c. 575, § 15.)

§ 502. Use of alcohol or drugs in connection with aircraft operations.

The State recognizes the serious hazard to safe aircraft operations and to the public resulting from the impairment of an airperson's faculties due to the use of alcohol or drugs. In conformity with Parts 61, 65 and 91 of the Federal Aviation Regulations, upon reasonable suspicion that an airperson may be acting under the influence of alcohol or drugs or be in possession of illegal drugs, the airperson shall submit to alcohol and/or drug testing administered by the Delaware State Police. Test results shall be forwarded to the Federal Aviation Administration by the Department. (70 Del. Laws, c. 575, § 16.; 70 Del. Laws, c. 186, § 1.)

§ 503. Penalties; jurisdiction.

Violations under this chapter shall be referred by the Department, through the Office of Aeronautics, to the Federal Aviation Administration for enforcement action and/or imposition of sanctions. (70 Del. Laws, c. 575, § 16.)

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[§ 601.](#) | [§ 602.](#) | [§ 603.](#)

TITLE 2

Transportation

PART I

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CHAPTER 6. OBSTRUCTIONS IN AIRPORT APPROACH AREAS

§ 601. Jurisdiction.

The Department may enforce this chapter by the filing of a complaint in a court of appropriate jurisdiction, including a complaint for injunctive relief. (70 Del. Laws, c. 575, § 17.)

§ 602. Erection or maintenance of obstructions; prohibitions.

(a) A building permit issued by the county or municipality having land use jurisdiction, after review and approval as provided herein, shall be required for the construction, erection, placement or alteration of any smokestack, tree, silo, flagpole, elevated tank, power line, radio or television tower, antenna, building, structure or other improvement to real property which meets any of the following conditions:

(1) Is greater than 200 feet in height above ground level;

(2) Is greater in height than an imaginary trapezoidal shape, beginning at the end of a runway of a public use airport, at an initial width of 50 feet, and extending outward and upward at a slope of 100:1 for a distance of 20,000 feet, to a width of 3,000 feet at its ending point;

(3) Is located within the runway approach area of each public use airport in the State; or

(4) Otherwise constitutes an obstruction as defined in this title or acts as an obstruction to the operation of aircraft as those terms are defined by Federal Aviation Regulation (FAR) Part 77.

(b) Such building permit for each such object or structure will not be issued until such time as the Department of Transportation through the Office of Aeronautics has reviewed and approved the application. The Department of Transportation, through the Office of Aeronautics, shall respond to the county or municipality having land use jurisdiction regarding any objections it has to the issuance of a building permit within 30 days of receipt of such permit for review.

(c) In order to provide safe aircraft approach areas to airport runways, the Department may, after notice and a hearing, enter upon any lands or improvements located thereon which are situated in said airport approach areas and may remove obstructions to aviation. Owners of obstructions that were erected prior to the enactment of or in compliance with this chapter are entitled to compensation for the removed obstruction and/or any damages incurred in the removal thereof from funds applicable to aeronautics and administered by the Office of Aeronautics. The process for condemnation of real property or improvements thereon under this chapter as required by applicable law and constitutional provisions shall be governed by the procedures set forth in Chapter 61 of Title 10 and Chapter 95 of Title 29.

(d) In order to ensure that new structures are not erected that pose potential obstruction hazards, it shall be unlawful to erect any new structure or add to any existing structure if such structure is thereby made to extend more than 200 feet above ground level at its site without giving prior notice to and obtaining prior approval from the Department. (70 Del. Laws, c. 575, § 17.)

§ 603. Erection or maintenance of obstructions; penalties.

Whoever constructs, erects, places or alters any obstruction without first obtaining a building permit as required in this chapter shall, upon being found liable therefore in a civil proceeding, be fined an amount not exceeding \$1,000. Each day's continuation of a violation of this section shall be deemed a separate and distinct offense, all of which may be brought together in a single action. (70 Del. Laws, c. 575, § 17.)

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[§ 701.](#) | [§ 702.](#) | [§ 703.](#) | [§ 704.](#) | [§ 705.](#) | [§ 706.](#) | [§ 707.](#) | [§ 708.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 7. STATE AIRPORTS

§ 701. Authority to establish, acquire and operate.

(a) The Department may, on behalf of and in the name of this State, within the limitation of available appropriations, acquire by purchase, gift, devise, lease, condemnation proceedings, or otherwise, property real or personal, for the purpose of establishing and constructing airports, restricted landing areas, and other air navigation facilities, and acquire in like manner, own, control, establish, construct, enlarge, improve, maintain, equip, operate, regulate, and police such airports, restricted landing areas, and other air navigation facilities, either within or without this State. It may make, prior to any such acquisition, investigations, surveys, and plans; and may erect, install, construct, and maintain at such airports facilities for the servicing of aircraft and for the comfort and accommodation of air travelers, and may dispose of any such property, airport, restricted landing area, or any other air navigation facility, by sale, lease, or otherwise, in accordance with the laws of this State governing the disposition of other like property of the State.

(b) The Department shall not, however, acquire or take over any airport, restricted landing area or other air navigation facility owned or controlled by a political subdivision without the consent of such political subdivision.

(c) The Department may erect, equip, operate, and maintain on any airport buildings and equipment necessary and proper to establish, maintain, and conduct such airport and air navigation facilities connected therewith. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(1); 2 Del. C. 1953, § 701; 57 Del. Laws, c. 671, § 12.)

§ 702. Acquisition of easements and airport protection privileges.

Where necessary, in order to provide unobstructed air space for the landing and taking off of aircraft utilizing airports and restricted landing areas acquired or operated under this chapter, the Department may acquire, in the same manner as is provided for the acquisition of property for airport purposes, easements through or other interests in air space over land or water, interests in airport hazards outside the boundaries of the airports or restricted landing areas, and such other airport protection privileges as are necessary to insure safe approaches to the landing areas of the airports and restricted landing areas, and the safe and efficient operation thereof. It may also acquire, in the same manner, the right or easement, for a term of years or perpetually, to place or maintain suitable marks

for the daytime marking and suitable lights for the nighttime marking of airport hazards, including the right of ingress and egress to or from such airport hazards for the purpose of maintaining and repairing such lights and marks. This authority shall not be so construed as to limit the right, power, or authority of the State or any political subdivision to zone property adjacent to any airport or restricted landing area pursuant to any law of this State. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(2); 2 Del. C. 1953, § 702; 57 Del. Laws, c. 671, § 12.)

§ 703. Joint operations.

The Department may engage in all the activities specified in §§ 701 and 702 of this title jointly with the United States, other states, and with political subdivisions or other agencies of this State. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(3); 2 Del. C. 1953, § 703; 57 Del. Laws, c. 671, § 12.)

§ 704. Condemnation.

(a) The Department may exercise the right of eminent domain, in the name of the State, for the acquisition of real property for public purposes, for the purpose of acquiring any property which it is authorized by this title to acquire by condemnation. In such cases, whenever the Department cannot agree with the owner of any land, building, franchise, easement, or other property necessary to be taken, it may institute condemnation proceedings in accordance with Chapter 61 of Title 10.

(b) The right of eminent domain herein granted extends to and includes the right to acquire the fee simple title to land, or an easement, or a right-of-way in, to, over or above such land or property as the Department deems necessary in making adequate and practical provisions for the removal of obstructions of any nature whatsoever in approaches to an airport or landing field.

(c) In the determination of the compensation to be paid in any condemnation proceeding authorized by this section, there shall be paid either the value of the property and facilities taken or the cost of any changes in or relocation of the property and facilities, whichever is higher.

(d) The fact that the property so needed has been acquired by the owner under power of eminent domain shall not prevent its acquisition by the Department by the exercise of the right of eminent domain herein conferred.

(e) For the purpose of making surveys and examinations relative to any condemnation proceeding, it is lawful to enter upon any land, doing no unnecessary damage. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(4); 2 Del. C. 1953, § 704; 57 Del. Laws, c. 671, § 12.)

§ 705. Leases and sales.

(a) The Department may lease for a term not exceeding 10 years, such airports, or other air navigation facilities or real property acquired or set apart for airport purposes, to private parties, any municipal or state government or the national government, or any department of either thereof, for operation or use consistent with the purposes of this chapter.

(b) The Department may lease or assign for a term not exceeding 10 years to private parties, any municipal or state government or the national government, or any department of either for operation or use consistent with the purposes of this chapter, space, area,

improvements or equipment on such airports.

(c) The Department may sell any part of such airports, other air navigation facilities or real property to any municipal or state government, or to the United States or any department or instrumentality thereof, for aeronautical purposes or purposes incidental thereto.

(d) The Department may confer the privilege of concessions of supplying upon the airports, goods, commodities, things, services and facilities.

(e) No lease, sale, assignment or privilege conferred under this section shall deprive the public of its rightful, equal and uniform use thereof. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(5); 2 Del. C. 1953, § 705; 57 Del. Laws, c. 671, § 12.)

§ 706. Charges and rentals; lien.

The Department may determine the charges or rental for the use of any properties and the charges for any service or accommodations under its control and the terms and conditions under which these properties may be used. No charge or rental under this section shall deprive the public of its rightful, equal, and uniform use of such property. Charges shall be reasonable and uniform for the same class of service and established with due regard to the property and improvements used and the expenses of operation to the State. The State shall have and the Department may enforce liens, as provided by law for liens and the enforcement thereof, for repairs to or improvement or storage or care of any personal property, to enforce the payment of any such charges. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 11(6); 2 Del. C. 1953, § 706; 57 Del. Laws, c. 671, § 12.)

§ 707. Department's functions and powers governmental.

The acquisition of any lands for the purpose of establishing airports or other air navigation facilities; the acquisition of any airport protection privileges; the acquisition, establishment, construction, enlargement, improvement, maintenance, equipment and operation of airports and other air navigation facilities, whether by the State separately or jointly with any political subdivision or subdivisions; the assistance of this State in any such acquisition, establishment, construction, enlargement, improvement, maintenance, equipment and operation; and the exercise of any other powers herein granted to the Department are public and governmental functions, exercised for a public purpose, and matters of public necessity, and such lands and other property and privileges acquired and used by the State in the manner and for the purposes enumerated in this chapter shall and are to be acquired and used for public and governmental purposes and as a matter of public necessity. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 12(1); 2 Del. C. 1953, § 707; 57 Del. Laws, c. 671, § 12.)

§ 708. Tort liability.

No action or suit sounding in tort shall be brought or maintained against the State or any political subdivision, or the officers, agents, servants or employees of the State or any political subdivision, on account of any act done in or about the construction, maintenance, enlargement, operation, superintendence or management of any airport or other air navigation facility. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 12(1); 2 Del. C. 1953, § 708.)

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[§ 901.](#) | [§ 902.](#) | [§ 903.](#) | [§ 904.](#) | [§ 905.](#) | [§ 906.](#) | [§ 907.](#) | [§ 908.](#) | [§ 909.](#) | [§ 910.](#) | [§ 911.](#) | [§ 912.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 9. AIRPORTS OF POLITICAL SUBDIVISIONS

Subchapter I. Establishment and Administration

§ 901. Interpretation and construction.

This chapter shall be so interpreted and construed as to make uniform so far as possible the laws and regulations of this State and other states and of the government of the United States having to do with the subject of aeronautics. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 16; 2 Del. C. 1953, § 901.)

§ 902. Public purpose and necessity.

The acquisition of any lands for the purpose of establishing airports or other air navigation facilities; the acquisition of airport protection privileges; the acquisition, establishment, construction, enlargement, improvement, maintenance, equipment and operation of airports and other air navigation facilities, and the exercise of any other powers herein granted to political subdivisions, are public, governmental, county and municipal functions, exercised for a public purpose, and matters of public necessity, and such lands and other property, easements and privileges acquired and used by such political subdivisions in the manner and for the purposes enumerated in this chapter shall and are to be acquired and used for public, governmental, county and municipal purposes and as a matter of public necessity. (Code 1935, c. 167; 45 Del. Laws, c. 300, §§ 3, 13; 2 Del. C. 1953, § 902.)

§ 903. Authority to establish, acquire and operate airports.

Every political subdivision may, through its governing body, acquire property, real or personal, for the purpose of establishing, constructing and enlarging airports and other air navigation facilities and may acquire, establish, construct, enlarge, improve, maintain, equip, operate and regulate such airports and other air navigation facilities and structures and other property incidental to their operation, either within or without the territorial limits of the political subdivision and within or without this State; may make, prior to any such acquisition, investigations, surveys and plans; may construct, install and maintain airport facilities for the servicing of aircraft and for the comfort and accommodation of air travelers; and may purchase and sell equipment and supplies as an incident to the operation of its airport properties. It may not, however, acquire or take over any airport or

other air navigation facility owned or controlled by any other political subdivision of the State without the consent of such political subdivision. It may use for airport purposes any available property that is now or may at any time hereafter be owned or controlled by it. Such air navigation facilities as are established on airports shall be supplementary to and coordinated in design and operation with those established and operated by the federal and state governments. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 2(1); 2 Del. C. 1953, § 903.)

§ 904. Establishment of airports on waters and reclaimed land.

(a) The powers granted in this chapter to a political subdivision to establish and maintain airports shall include the power to establish and maintain such airports in, over and upon any public waters of this State within the limits or jurisdiction of or bordering on the political subdivision, any submerged land under such public waters, and any artificial or reclaimed land which before the artificial making or reclamation thereof constituted a portion of the submerged land under such public waters, and as well the power to construct and maintain terminal buildings, landing floats, causeways, roadways and bridges for approaches to or connecting with the airport, and landing floats and breakwaters for the protection of any such airport.

(b) All the other powers granted in this chapter to political subdivisions with reference to airports on land are granted to them with reference to such airports in, over and upon public waters, submerged land under public waters, an artificial or reclaimed land. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 10; 2 Del. C. 1953, § 904.)

§ 905. Means of acquiring airport property.

(a) Property needed by a political subdivision for an airport or restricted landing area, or for the enlargement of either, or for other airport purposes, may be acquired by purchase, gift, devise, lease or other means if such political subdivision is able to agree with the owners of the property on the terms of the acquisition, and otherwise by condemnation in the manner provided in § 906 of this title. Full power to exercise the right of eminent domain for such purposes is granted every political subdivision both within and without its territorial limits.

(b) The right of eminent domain granted in this section extends to and includes the right to acquire the fee simple title to land, or an easement, or a right-of-way in, to, over or above such land or property as the political subdivision deems necessary in making adequate and practical provisions for the removal of obstructions of any nature in approaches to an airport or landing field.

(c) The fact that the property needed has been acquired by the owner under power of eminent domain shall not prevent its acquisition by the political subdivision by the exercise of the right of eminent domain herein conferred. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 2(2); 2 Del. C. 1953, § 905.)

§ 906. Condemnation.

(a) Whenever the political subdivision cannot agree with the owner of any land, building, franchise, easement or other property necessary to be taken, the political subdivision may institute condemnation proceedings in accordance with Chapter 61 of Title 10.

(b) In the determination of the compensation to be paid in any condemnation proceeding authorized by this section, there shall be paid either the value of the property

and facilities taken or the cost of any changes in or relocation of the property and facilities, whichever is higher.

(c) For the purpose of making surveys and examinations relative to any condemnation proceedings, it shall be lawful to enter upon any land, doing no unnecessary damage. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 2(2); 2 Del. C. 1953, § 906.)

§ 907. Acquisition of easements and airport protection privileges.

Where necessary, in order to provide unobstructed air space for the landing and taking off of aircraft utilizing airports or restricted landing areas acquired or operated under the provisions of this chapter, every political subdivision may acquire, in the same manner as is provided for the acquisition of property for airport purposes, easements through or other interests in air spaces over land or water, interests in airport hazards outside the boundaries of the airports or restricted landing areas and such other airport protection privileges as are necessary to insure safe approaches to the landing areas of the airports or restricted landing areas and the safe and efficient operation thereof. Every political subdivision may also acquire, in the same manner, the right or easement, for a term of years or perpetually, to place or maintain suitable marks for the daytime marking and suitable lights for the nighttime marking of airport hazards, including the right of ingress and egress to or from such airport hazards, for the purpose of maintaining and repairing such lights and marks. This authority shall not be so construed as to limit any right, power or authority to zone property adjacent to airports and restricted landing areas under any laws of this State. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 2(3); 2 Del. C. 1953, § 907.)

§ 908. Validation of prior acquisition of airport property.

Any acquisition of property within or without the limits of any political subdivision for airports and other air navigation facilities, or of airport protection privileges, heretofore made by any political subdivision in any manner, together with the conveyance and acceptance thereof, is valid and effective. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 4; 2 Del. C. 1953, § 908.)

§ 909. Specific powers of political subdivisions.

In addition to the general powers in this chapter conferred, and without limitation thereof, a political subdivision which has established or may hereafter establish airports, restricted landing areas or other air navigation facilities, or which has acquired or set apart or may hereafter acquire or set apart real property for such purpose or purposes may:

(1) Delegations of authority. -- Vest authority for the construction, enlargement, improvement, maintenance, equipment, operation and regulation thereof in an officer, a board or body of the political subdivision by ordinance or resolution which shall prescribe the powers and duties of the officer, board or body. The expense of construction, enlargement, improvement, maintenance, equipment, operation and regulation shall be a responsibility of the political subdivision.

(2) Rules, regulations and ordinances. -- Adopt and amend all needful rules, regulations and ordinances for the management, government and use of any properties under its control, whether within or without the territorial limits of the political subdivision; may appoint airport guards or police, with full police powers; may fix by ordinance or resolution, as may be appropriate, penalties for the violation of its rules, regulations and ordinances, and enforce the penalties in the same manner in which penalties prescribed by

other rules, regulations and ordinances of the political subdivision are enforced. For the purposes of such management and government and direction of public use, such part of all highways, roads, streets, avenues, boulevards and territory as adjoins, or lies within 100 feet of the limits of any airport or restricted landing area acquired or maintained under this chapter shall be under like control and management of the political subdivision. It may also adopt and enact rules, regulations and ordinances designed to safeguard the public upon or beyond the limits of private airports or landing strips within the political subdivision or its police jurisdiction against the perils and hazards of instrumentalities used in aerial navigation. Rules, regulations and ordinances shall be published as provided by general law or the charter of the political subdivision for the publication of similar rules, regulations and ordinances. They must conform to and be consistent with the laws of this State and the rules and regulations of the Department of Transportation and shall be kept in conformity, as nearly as may be, with the then current federal legislation governing aeronautics and the regulations duly promulgated thereunder and rules and standards issued from time to time pursuant thereto.

(3) Leases and sales. -- Lease under such terms and conditions as it shall decide such airports or other air navigation facilities, or real property acquired or set apart for airport purposes, to private parties, any municipal or state government or the national government, or any department of either thereof, for operation; may lease or assign under such terms and conditions as it shall decide to private parties, any municipal or state government or the national government, or any department of either thereof, for operation or use consistent with the purposes of this chapter, space, area, improvements or equipment on such airports; may sell any part of such airports, other air navigation facilities or real property to any municipal or state government, or to the United States or any department or instrumentality thereof, for aeronautical purposes or purposes incidental thereto and may confer the privileges of concessions of supplying upon its airports goods, commodities, things, services and facilities. In no case in so doing may the public be deprived of its rightful, equal, and uniform use thereof.

(4) Disposition of unnecessary property. -- Sell or lease any property, real or personal, acquired for airport purposes and belonging to the political subdivision, which, in the judgment of its governing body, may not be required for aeronautic purposes, in accordance with the laws of this State, or the provisions of the charter of the political subdivision, governing the sale or leasing of similarly owned property.

The proceeds of sale of any property the purchase price of which was obtained by the sale of bonds shall be deposited in the sinking fund from which funds have been authorized to be taken to finance such bonds. In the event all the proceeds of the sale are not needed to pay the principal of the bonds remaining unpaid, the remainder shall be paid into the airport fund of the political subdivision. The proceeds of sales of property the purchase price of which was paid from appropriations shall be paid into the airport fund of the political subdivision.

(5) Charges and rentals; liens. -- Determine the charges or rental for the use of any properties under its control and the charges for any services or accommodations, and the terms and conditions under which such properties may be used. In no case may the public be deprived of its rightful, equal and uniform use of such property. Charges shall be reasonable and uniform for the same class of service and established with due regard to the property and improvements used and the expense of operation to the political subdivision. The political subdivision shall have and may enforce liens, as provided by law for liens and enforcement thereof, for repairs to or improvement or storage or care of any personal property, to enforce the payment of any such charges.

(6) Incidental powers. -- Exercise all powers necessarily incidental to the exercise

of the general and special powers herein granted. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 8; 2 Del. C. 1953, § 909; 51 Del. Laws, c. 225; 57 Del. Laws, c. 671, § 13; 60 Del. Laws, c. 503, § 26.)

§ 910. Encroachment upon airport protection privileges; abatement.

No person shall build, rebuild, create, or cause to be built, rebuilt or created any object, or plant, cause to be planted or permit to grow higher any tree or trees or other vegetation, which shall encroach upon any airport protection privileges acquired pursuant to this chapter. Any such encroachment is a public nuisance and may be abated in the manner prescribed by law for the abatement of public nuisances, or the political subdivision in charge of the airport or restricted landing area for which airport protection privileges have been acquired under this chapter may go upon the land of others and remove any such encroachment without being liable for damages in so doing. (45 Del. Laws, c. 300, § 2 (4); 2 Del. C. 1953, § 910.)

§ 911. Assistance to other political subdivisions.

Whenever the governing body of any political subdivision determines that the public interest and the interests of the political subdivision will be served by assisting any other political subdivision in exercising the powers and authority granted by this chapter, the first-mentioned political subdivision is expressly authorized and empowered to furnish such assistance by gift, or lease with or without rental, of real property, by the donation, lease with or without rental, or loan, of personal property, and by the appropriation of moneys, which may be provided for by taxation or the issuance of bonds in the same manner as funds might be provided for the same purposes if the political subdivision were exercising the powers granted in its own behalf. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 12; 2 Del. C. 1953, § 911.)

§ 912. Exclusiveness of jurisdiction.

Every airport and other air navigation facility controlled and operated by any political subdivision, or jointly controlled and operated pursuant to this chapter, shall, subject to federal and state laws, rules and regulations, be under the exclusive jurisdiction and control of the political subdivision or subdivisions controlling and operating it and no other political subdivision in which such airport or air navigation facility may be located shall have any police jurisdiction of the same or any authority to charge or exact any license fees or occupation taxes for the operations thereon. Such political subdivision or subdivisions shall have concurrent jurisdiction over the adjacent territory described in subdivision (2) of § 909 of this title. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 14; 2 Del. C. 1953, § 912.)

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[§ 921.](#) | [§ 922.](#) | [§ 923.](#) | [§ 924.](#) | [§ 925.](#) | [§ 926.](#)

TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 9. AIRPORTS OF POLITICAL SUBDIVISIONS

Subchapter II. Financing and Taxation

§ 921. Exemption of airport property and income from taxation.

Any property acquired by a political subdivision pursuant to this chapter shall be exempt from taxation to the same extent as other property used for public purposes. All income received in connection with the operation by a political subdivision of any airport or other air navigation facility shall also be exempt from taxation. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 5; 2 Del. C. 1953, § 921.)

§ 922. Payment of purchase price and improvement costs; definition of "cost."

The cost of investigating, surveying, planning, acquiring, establishing, constructing, enlarging or improving or equipping airports and other air navigation facilities, and the sites therefor, including structures and other property incidental to their operation, in accordance with this chapter may be paid for by appropriation of moneys available therefor, or wholly or partly from the proceeds of bonds of the political subdivision, as the governing body of the political subdivision shall determine.

As used in this section "cost" includes awards in condemnation proceedings and rentals where an acquisition is by lease. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 6(1); 2 Del. C. 1953, § 922.)

§ 923. Bond issues.

(a) Any bonds to be issued by any political subdivision pursuant to this chapter shall be authorized and issued in the manner and within the limitation, except as herein otherwise provided, prescribed by the laws of this State or the charter of the political subdivision for the issuance and authorization of bonds thereof for public purposes generally.

(b) Irrespective of any limitation, by general or special law or charter, as to the amount of bonds which may be issued, a political subdivision may issue bonds for the purposes defined by this chapter in excess of such limitation, in such amount as may be authorized by an ordinance or resolution referred to and approved by the voters of such political subdivision by popular vote, at any general election or special election called for that

purpose.

(c) The amount of all bonds issued by any political subdivision for the purposes defined in this chapter shall not be counted or included in the net indebtedness of the political subdivision or in any computation of the outstanding indebtedness of the political subdivision for the purpose of determining the limit of net indebtedness thereof. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 6(2)-(4); 2 Del. C. 1953, § 923.)

§ 924. Validation of prior bonds.

In all cases where a political subdivision has issued any bonds for the purpose of investigating, surveying, planning, acquiring, establishing, constructing, enlarging, equipping, or improving any airport, or other air navigation facility, or site therefor, or to meet the cost of structures or other property incidental to their operation, whether such airport or other air navigation facility was termed under the law existing at the time of the issuance of such bonds an airport, a landing field, a landing strip, an aviation field or a flying field, or has incurred any other indebtedness, or entered into any lease or other contract in connection with the acquisition, establishment, construction, ownership, enlargement, control, leasing, equipment, improvement, maintenance, operation or regulation of any such airport or other air navigation facility, or site therefor, or structure or other property incidental to its operation, the proceedings heretofore taken in all such cases are in all respects validated and confirmed. Any bonds already issued thereunder are validated and made legal obligations of such political subdivision and the political subdivision is authorized and empowered, pursuant to such proceedings, to issue further bonds for such purposes up to the limit fixed in the original authorization thereof, without limitation of the general power granted in this chapter to all political subdivisions in this State, which bonds when issued shall be legal obligations of the political subdivision according to their terms. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 6(5); 2 Del. C. 1953, § 924.)

§ 925. Authority to appropriate and expend moneys and to levy taxes.

(a) The governing bodies having power to appropriate moneys within the political subdivisions in this State acquiring, establishing, constructing, enlarging, improving, maintaining, equipping or operating airports and other air navigation facilities under this chapter may appropriate and cause to be raised by taxation or otherwise in such political subdivisions moneys sufficient to carry out therein the provisions of this chapter.

(b) Irrespective of any limitation, by general or special law or charter, as to the amount or total of taxes that may be levied, a political subdivision may levy taxes for the purposes authorized by this chapter, in excess of such limitations, in such amount as may be authorized by an ordinance or resolution referred to and approved by the voters of such political subdivision by popular vote. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 7(1), (2); 2 Del. C. 1953, § 925.)

§ 926. Use of airport revenues.

The revenues obtained from the ownership, control and operation of any airport or other air navigation facility shall be used, first, to finance the maintenance and operating expenses thereof, and, second, to make payments of interest on and current principal requirements of any outstanding bonds or certificates issued for the acquisition or improvement thereof, and to make payment of interest on any mortgage heretofore made. Revenues in excess of the foregoing requirements may be applied to finance the extension or improvement of the airport or other air navigation facilities. (Code 1935, c. 167; 45 Del.

Laws, c. 300, § 7(3); 2 Del. C. 1953, § 926.)

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TITLE 2

Transportation

PART I

Aeronautics

CHAPTER 9. AIRPORTS OF POLITICAL SUBDIVISIONS

Subchapter III. Federal Aid

§ 931. Receipt of aid; expenditure of moneys.

Every political subdivision may accept, receive and receipt for federal moneys, and other moneys, either public or private, for the acquisition, construction, enlargement, improvement, maintenance, equipment or operation of airports and other air navigation facilities, and sites therefor, and comply with the provisions of the laws of the United States and any rules and regulations made thereunder for the expenditure of federal moneys upon such airports and other air navigation facilities. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 9(1); 2 Del. C. 1953, § 931.)

§ 932. Department of Transportation as agent; conditions of grant.

(a) The governing body of any political subdivision may designate the Department of Transportation as its agent to accept, receive and receipt for federal moneys in its behalf for airport purposes and to contract for the acquisition, construction, enlargement, improvement, maintenance, equipment or operation of such airports, or other air navigation facilities, and may enter into an agreement with the Department of Transportation prescribing the terms and conditions of the agency in accordance with federal laws, rules and regulations and applicable laws of this State.

(b) The moneys that are paid over by the United States government shall be paid over to the political subdivision under such terms and conditions as may be imposed by the United States government in making the grant. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 9(2); 2 Del. C. 1953, § 932; 57 Del. Laws, c. 671, § 13; 60 Del. Laws, c. 503, § 26.)

§ 933. Contracts; law governing.

(a) All contracts for the acquisition, construction, enlargement, improvement, maintenance, equipment or operation of airports or other air navigation facilities, made by the political subdivision itself or through the agency of the Department of Transportation, shall be made pursuant to the laws of this State governing the making of like contracts.

(b) Where the acquisition, construction, improvement, enlargement, maintenance,

equipment or operation is financed wholly or partly with federal moneys, the political subdivision, or the Department of Transportation as its agent, may let contracts in the manner prescribed by the federal authorities, acting under the laws of the United States, and any rules or regulations made thereunder, notwithstanding any other state law to the contrary. (Code 1935, c. 167; 45 Del. Laws, c. 300, § 9(3); 2 Del. C. 1953, § 933; 57 Del. Laws, c. 671, § 13; 60 Del. Laws, c. 503, § 26.)

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[§ 2001.](#) | [§ 2002.](#) | [§ 2003.](#) | [§ 2004.](#) | [§ 2005.](#) | [§ 2006.](#) | [§ 2007.](#) | [§ 2008.](#) | [§ 2009.](#) | [§ 2010.](#) | [§ 2011.](#) | [§ 2012.](#)

TITLE 2

Transportation

PART II

Transportation Department

CHAPTER 20. PUBLIC-PRIVATE INITIATIVES PROGRAM IN TRANSPORTATION

§ 2001. Findings and declaration of policy.

The General Assembly hereby finds and declares that:

(a) It is essential for the economic, social and environmental well being of the State and the maintenance of a high quality of life that the citizens of the State have an efficient transportation system.

(b) The State has limited resources to fund the maintenance and expansion of the State transportation system and therefore alternative funding sources should be developed to supplement public revenue sources.

(c) A significant alternative to public revenue sources is a public-private sector initiatives program permitting private entities to undertake all or a portion of the study, planning, design, development, financing, acquisition, installation, construction, improvement, expansion, repair, operation and maintenance of public transportation projects for the citizens of Delaware in exchange for the right to lease or own the facilities for an agreed-upon period and earn a reasonable rate of return through tolls or user fees.

(d) In addition to alleviating the strain on the public treasury and allowing the State to use its limited resources for other needed projects, public-private initiative projects also do all of the following:

(1) Take advantage of private sector efficiencies in designing and building transportation projects and financial and development expertise;

(2) Allow for the rapid formation of capital necessary for funding transportation projects;

(3) More quickly reduce congestion in existing transportation corridors and provide the public with alternate route and mode selections;

(4) Provide the opportunity to link transportation investments with land use measures which further the State's growth management and clean air policies;

(5) Provide sound investment opportunities for the private sector; and

(6) Require continued compliance with environmental requirements and applicable state and federal laws that all publicly financed projects must address.

(e) The Department should be permitted and encouraged to test the feasibility of building privately-funded transportation systems and facilities through innovative agreements with the private sector by developing projects, and the Secretary should be granted authority to entertain, solicit, evaluate, negotiate and administer such agreements.

(f) The Department is encouraged and authorized to take full advantage of every financing opportunity and mechanism provided by federal legislation, including transportation legislation facilitating federal financing or grants for construction, improvement, leasing, operation or related functions as to roads, bridges, tunnels or other transportation systems.

(g) A Public-Private Initiatives Program Revolving Loan Fund, which would allow available federal and State funds to be leveraged, should be established to provide a source of public funds for partial financing of projects. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, §§ 82-84.)

§ 2002. Definitions.

As used in this chapter, unless the context indicates a different intent:

(a) "Agreement" means an agreement entered into by the Secretary and one or more contracting parties for a project.

(b) "Contracting party" means any individual, corporation, partnership, company, trust, association, joint venture, pool, syndicate, sole proprietorship, unincorporated association, body politic, authority or any other form of entity not specifically listed herein entering into an agreement with the Secretary for a project.

(c) "Project" means any public transportation project undertaken under this chapter.

(d) "Department" means the Department of Transportation.

(e) "Metropolitan planning organization" means a metropolitan planning organization established and designated pursuant to 23 U.S.C. § 134 (1993).

(f) "Secretary" means the Secretary of Transportation.

(g) "Transportation System" means any capital-related improvement and addition to the State's transportation infrastructure, including but not limited to highways, roads, bridges, vehicles and equipment, ports and marine-related facilities, park and ride lots, rail and other transit systems, facilities, stations and equipment, rest areas, tunnels, airports, transportation management systems, control/communications/information systems and other transportation-related investments, or any combination thereof. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, §§ 82, 85.)

§ 2003. Projects.

(a) Project. -- Subject to subsection (c) of this section, the Secretary may entertain and solicit proposals from, and may negotiate and enter into agreements with, private entities or consortia thereof, for projects using in whole or in part private sources of financing involving (i) all or a portion of the study, planning, design, construction, leasing, financing, operation and maintenance of transportation systems, or (ii) the repair, and/or expansion, leasing, financing, operation and maintenance of existing transportation systems, or any combination of the foregoing.

(b) Eligibility. -- The Secretary may entertain and solicit proposals from any source whatsoever; provided however, that the Secretary shall only enter into agreements regarding a transportation project that has been specifically authorized by the General Assembly, and that such authorization includes all material terms of the proposed project, including without limitation any terms concerning repayment of debt or capital to or for the benefit of any private entity; further provided (i) which has been authorized by the Delaware General Assembly (except that no agreement may be entered into which compels (A) direct or indirect expenditures or loans on the part of the State in excess of the total sum which may be appropriated by the Delaware General Assembly as the State's financial participation with respect to said transportation system or; (B) credit enhancements which pledge the full faith and credit of the State); and/or (ii) for which the General Assembly has provided specific or categorical funding authorization for purposes of implementing this chapter; and (iii) which is consistent with § 8419(2)(a) of Title 29, applicable provisions of the Department's long range transportation plan, any applicable recommendations developed by the Cabinet Committee on State Planning pursuant to Chapter 91 of Title 29, and applicable provisions of the Federal Clean Air Act >42 U.S.C. § 1857 et seq. and 42 U.S.C. § 7551|.

(c) Proposals. --

(1) The Secretary shall solicit proposals through a request for proposals pursuant to Chapter 69, Title 29, accompanied by material explaining of the Public-Private Initiatives Program enacted hereunder and describing the selection process and criteria. The Secretary may identify in these requests for proposals specific systems, corridors or routes for improvement.

(2) Alternatively, potential projects may be identified and proposed by any potential contracting party. Such unsolicited proposals will also be accepted provided they satisfy the criteria outlined in accordance with this chapter. In the event that an unsolicited proposal is deemed in compliance with this chapter and accepted for review, the Secretary shall publicly announce, not less than once a week for 2 consecutive weeks in a newspaper published or circulated in each county of the State, the acceptance of the unsolicited proposal along with a detailed description of the unsolicited proposal, and shall provide 60 days within which other interested parties may submit proposals relating to the same subject. Notwithstanding any other provisions of this Code to the contrary, all proposals made pursuant to this chapter may provide for the design-build mode of infrastructure development;

(3) Proprietary information contained in proposals not selected for projects and records of negotiations in progress shall be exempt from public disclosure.

(d) Fees authorized. -- To offset a portion of the costs of initiating this program and reviewing proposals received for projects under this chapter, the Department is authorized to assess a non-refundable Proposal Review Fee for each proposal not to exceed \$50,000.00.

(e) Selection and approval. --

(1) The projects shall be selected by a project committee, chaired by the Secretary, consisting of the Secretary, the Director of Financial Management and Budget, the Chief Engineer of the Department of Transportation, and up to 4 other persons to be appointed by the Secretary. The projects shall be selected without regard to the provisions of Chapter 69 of Title 29.

Each proposal shall be weighed on its own merits and ranked according to the selection criteria stipulated in the request for proposals, provided that upon receipt of all proposals the project committee may group similar types of project proposals together for purposes of evaluation and selection, and provided further that the proposals selected by such committee from any such group of proposals must be those with the highest ranking within that group, and provided further that such committee may elect not to select any proposals from an established group of proposals, and provided further that as to similar proposals or proposals that are mutually exclusive so that the undertaking of one would preclude the need, desirability, or ability of undertaking the other, only the proposal with the highest ranking among such proposals shall be selected, and, subject to approval as set forth above, proceed to negotiations. Each of the agreements shall be negotiated individually as a stand-alone project.

(2) Each selected project must be subsequently approved, within 45 days of its selection, by both (i) the directly affected metropolitan planning organization(s) and (ii) the Council on Transportation established pursuant to § 8409 of Title 29 or its successor, in that order. If a directly affected metropolitan planning organization approves a selected project, it shall be deemed to have given its approval to amend the Transportation Improvement Program to include such project. If the Council on Transportation approves a selected project, it shall be deemed to have given its approval to amend the Capital Improvements Program to include such project. Approval for each selected project by the affected metropolitan planning organization and the Council on Transportation shall be based solely upon the project's compatibility with State and regional transportation plans, compliance with applicable laws and regulations, and fiscal impact upon the State Capital Improvement Program or regional Transportation Improvement Program. If either organization disapproves a project, it shall set forth in writing its reasons for doing so. If neither approval nor disapproval is granted within 45 days after such proposal was delivered to any affected metropolitan planning organization or the Council on Transportation, such proposal shall be deemed approved by those organizations. Moreover, in the event that a project is disapproved as provided above, the Department may resubmit the plan or revise version thereof no sooner than 60 days after notification that the plan has been disapproved by either party.

(3) The Secretary shall promptly notify the Co-chairs of the Joint Bond Bill Committee of the Delaware General Assembly when a project has been duly selected by the project committee. After the Co-chairs' receipt of such notice, the Co-chairs shall meet and either approve or reject the project. Upon their approval of the project, it shall be deemed as an amendment to the Capital Improvements Program for the fiscal year in which the approval is granted.

(f) Compliance. -- Except as otherwise expressly provided in this chapter, all projects must comply with all applicable rules and statutes in existence at the time the agreement is entered into, including but not limited to this title, § 711 of Title 19, § 6960 of Title 29 and 49 C.F.R. Part 21, provided that the provisions of Chapter 69 of Title 29 other than § 6960 of Title 29 thereof shall not be applicable to the projects regardless of the use of State funds. Compliance with § 6960 of Title 29, or in the alternative, federal prevailing wage laws, shall be required without regard to the source of funds for a project. Each agreement may provide for protection for the contracting party from future discretionary regulatory changes which would substantially or materially change the terms and

conditions or financial assumptions of the agreement.

(g) Financing. --

(1) The Department is authorized, notwithstanding any other provision of this Code, to (i) use any federal, state or other funds, including without limitation funds obtained from or through the Delaware Transportation Authority, any loans from the Public-Private Initiatives Program Revolving Loan Fund established in § 2912 of this title and federal transportation funds, to finance, secure, guarantee, service project debt or repay project costs; and (ii) do such things as necessary and desirable to maximize the funding and financing of such projects, provided that private capital participation in the total capital cost for each project shall be negotiated with the other terms of the agreement. Notwithstanding other provisions of this chapter, the amount of such participation shall be taken into account in determining the negotiated rate of return on the investment in the project. In addition, the projected total percentage of public capital investment, as well as the limits of the Department's financial liability for the project, shall be expressly disclosed in the agreement.

(2) The Department, either directly or through a designated party, may apply for, receive and accept from any federal agency or any other governmental body grants or financial support of whatever nature for any purpose described in this chapter. The Department may transfer or lend the proceeds of any such grant, or utilize such proceeds available for credit enhancement, to public agencies or contracting parties, on terms and conditions complying with applicable federal and state law. (70 Del. Laws, c. 280, § 1; 71 Del. Laws, c. 150, § 78; 72 Del. Laws, c. 164, § 1; 74 Del. Laws, c. 69, §§ 82, 86-92.)

§ 2004. Ownership and lease of project transportation systems.

(a) Agreements may provide for either private or State ownership of the project during the construction period, depending on the project structure determined by the Secretary. Each agreement shall provide for State ownership or control of the underlying real property at all times, except as provided in subsection (b) or subsection (c) of this section. After completion and final acceptance of each project, or discrete segment thereof, the agreement shall provide for State ownership of the project and lease to the contracting party, unless the State elects to provide for ownership of the project or portion thereof by the contracting party during the term of the agreement in which case the agreement shall provide for the transfer of the project to the State at no charge at the expiration of the term of the agreement. The State shall lease each of the projects, or applicable project segments, to the contracting parties for up to 50 years after completion of such projects. An agreement may provide for lease payments to consist of royalties.

(b) If state ownership or control of railroad rights-of-way used in a project is not feasible, for example, but not by way of limitation, due to federal ownership of said rights-of-way, an agreement for a project may nonetheless be approved, subject to the following limitations:

(1) State ownership or control of any other real property utilized in the project, as well as compliance with all other provisions of subsection (a) of this section, shall nonetheless be required;

(2) The negotiations on the rate of return to the contracting party during the term of the agreement shall take this reduced ownership/control factor into account; and

(3) All expenses relating to the indemnification of the owner of any railroad rights-

of-way must be borne by the contracting party, notwithstanding the provisions of § 2008 of this title.

(c) An agreement for a project in which the state does not assume ownership or control of the underlying real property involved in the project may be approved, subject to the following limitations:

(1) Compliance with all other provisions of subsection (a) of this section shall nonetheless be required;

(2) The negotiations on the rate of return to the contracting party during the term of the agreement shall take this reduced ownership/control factor into account; and

(3) All expenses relating to the indemnification of the owner of any such real property must be borne by the contracting party, notwithstanding the provisions of § 2008 of this title. (70 Del. Laws, c. 280, § 1; 71 Del. Laws, c. 150, §§ 80, 81; 72 Del. Laws, c. 164, § 2; 74 Del. Laws, c. 69, §§ 82, 93.)

§ 2005. Exercise of Department's powers.

For purposes of facilitating these projects and to assist the contracting parties in the financing, development, construction leasing, maintenance and operation of such projects, the agreements may include provisions for the Department to exercise any powers conferred upon it by law, including but not limited to the lease of rights of way and airspace, granting of necessary easements and rights of access, power of eminent domain, granting of development rights and opportunities, issuance of permits or other authorizations, protection from competition, remedies in the event of default of either of the parties, granting of contractual and real property rights, liability during construction and the term of the lease, and the authority to negotiate acquisition of rights of way in excess of appraised value. Amounts paid by a contracting party for any right-of-way in excess of the appraised value thereof may be considered a contribution to the project only to the same extent that such excess amounts could be paid by the Department to acquire the right-of-way under applicable law. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, §§ 82, 94.)

§ 2006. Authorization of tolls and user fees; limitations on toll and user fee revenues.

(a) Authorization of tolls and user fees. -- Each agreement may authorize the contracting party to impose tolls or user fees for use of the transportation system constructed and/or leased by it to allow a reasonable rate of return on investment. The agreement may authorize the contracting party to collect tolls or user fees through both conventional methods and non-conventional methods including, but not limited to, automatic vehicle identification systems, electronic toll collection systems and, to the extent permitted by law, video-based toll collection enforcement. The agreement may authorize the collection of tolls and user fees by a 3rd party.

(b) Classification of tolls and user fees. -- A contracting party may establish different toll rates or user fees based on categories such as vehicle class or vehicle weight and may further vary toll rates by time of day or year.

(c) Maximum rate of return. -- A maximum rate of return on investment shall be negotiated by the parties and stated in the agreement. A contracting party may establish and modify toll rates and user fees as long as the maximum rate of return on investment is not exceeded.

(d) Uses of revenues. -- Each agreement shall require that over the term of the lease toll or user fee revenues be applied to payment of the contracting party's capital outlay costs for the project, including interest expense, the project's operations costs, costs of toll collections, administration of the project, any reimbursement to the State for the costs of project review and oversight, maintenance and police services, establishment and funding of a fund to ensure the adequacy of maintenance expenditures, a reasonable return on investment to the contracting party, and any other use mutually agreed upon by the parties and specifically set forth in the agreement, regardless of any contrary provisions of Delaware law.

(e) Excess revenues. -- As agreed upon by the parties the agreement may require that any revenues in excess of the maximum rate of return allowed in the agreement either be applied to any indebtedness incurred by the contracting party in connection with the project and/or be paid to one or more other entities or funds including, but not limited to, the Revolving Loan Fund established in § 2012 of this title, the State's Transportation Trust Fund established under § 1404 of this title, the Department, or the State. For the purpose of determining whether there are revenues in excess of the maximum rate of return (or in excess of any incentive rate of return authorized by the agreement pursuant to subsection (f) of this section), the agreement shall expressly provide for an annual audit to be performed (at the expense of the contracting party) by the same auditor chosen to perform the annual audit of the Transportation Trust Fund pursuant to § 1323 of this title and the certification of the rate of return which the contracting party has realized during the audited period. The contracting party shall maintain its books and corporate records in the State.

(f) Incentive rates of return. -- Notwithstanding § 2006(c) of this title, each agreement or an amendment to each agreement may provide for incentive rates of return in excess of the maximum rate of return established in the agreement for the attainment of specific safety, performance, transportation demand management or other goals set forth in the agreement or amendment.

(g) Continuation of tolls. -- After expiration of the lease or ownership period of a project to or by a contracting party, the Department may continue to charge tolls or user fees for the use of the project. The Department may delegate such authority to continue to collect tolls or user fees for the use of the project to a third party, provided that such revenues must first be used for operations and maintenance of the project and, subsequently, any revenues determined by the Secretary to be excess must be paid by such 3rd party to the State's Transportation Trust Fund, the Department or the State. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, § 95.)

§ 2007. Reimbursement for services rendered by department or other State agencies.

(a) Police services. -- Each project is deemed to be part of the State Transportation System. The Delaware State Police shall have primary jurisdiction over each project except with respect to all or any portion of a project located in a jurisdiction where primary law enforcement responsibility is delegated to another law enforcement agency by law or by applicable status of forces agreements or otherwise. Each law enforcement agency rendering services pursuant to the above shall receive reimbursement for such services in accordance with an agreement that the contracting party shall enter into with such agency.

(b) Maintenance services. -- Agreements for maintenance services may be entered into under this chapter with the Department or other State agencies, provided that such agreements shall provide for full reimbursement for services rendered by the Department or such other agencies.

(c) Coordination of permits and licenses. -- The Department shall, with the mandatory assistance of all applicable State agencies and departments, establish a unified permitting and licensing process in the Department for the processing and issuance of all necessary permits and licenses for projects under this chapter, including, but not limited to, all environmental permits, businesses and tax licenses and transportation permits. The Department shall seek the cooperation of federal and local agencies to expedite all necessary federal and local permits, licenses and approvals necessary for the projects, provided, however, that the agreements shall provide for full reimbursement for services rendered by the Department or other agencies.

(d) Other. -- The Department may provide services for which it is reimbursed including, but not limited to, preliminary planning, environmental certification (including the procurement of all necessary environmental permits), and preliminary design of the projects. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, § 82.)

§ 2008. Liability coverage; indemnification.

Each agreement must require that liability insurance coverage of an amount appropriate to protect the project's viability is secured and maintained by the contracting party. Each agreement may provide for State indemnification of the contracting party for design and construction liability where the State has approved relevant design and construction plans. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, § 82.)

§ 2009. Other agreement provisions.

(a) Grant of rights to contracting party. -- An agreement may include provisions authorizing the State to grant necessary easements and lease to a contracting party existing rights of way or rights of way subsequently acquired. An agreement may also include provisions to lease the airspace above or below the right of way associated with the project to the contracting party at less than fair market value during the term of the contracting party's lease of the project, provided that if the Department continues to lease the airspace rights to the contracting party after the expiration of such lease term, it must do so only at fair market value. The agreement may also grant the contracting party the right of first refusal to undertake projects utilizing real estate and airspace owned by the Department within or contiguous to the right of way, provided that in the judgment of the Secretary such projects must contribute to the public use and benefit of the project, and provided further that nothing herein shall derogate from the Department's power to declare real estate or airspace owned by the Department surplus to the needs of the Department pursuant to § 137 of Title 17 or any successor provision.

(b) Miscellaneous. -- An agreement may include any contractual provision that is necessary to protect the project revenues required to repay the costs incurred to study, plan, design, finance, acquire, build, install, lease, operate, enforce laws, and maintain the transportation system including, but not limited to, a traffic guarantee, an equity guarantee or insurance provided that such provision will not unreasonably prohibit the development of essential public transportation systems and facilities. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, §§ 82, 96.)

§ 2010. Operation of toll facility.

At the request of a contracting party operating a toll facility hereunder, the Department may adopt and enforce reasonable regulations consistent with State law which (i) set maximum and minimum speeds, (ii) exclude undesirable vehicles, cargoes, or materials from the use of the facility, (iii) establish high occupancy or express lanes for use during all

or any part of a day and limit the use of such lanes to certain traffic, (iv) determine points of access, (v) determine truck/trailer multiples, (vi) determine truck weight stations, and (vii) determine truck weight limits. (70 Del. Laws, c. 280, § 1.)

§ 2011. Plans and specifications.

The plans and specifications for each project constructed pursuant to this chapter shall comply with the Department's standards for state projects and any applicable federal standards. Each project is deemed to be part of the State highway system for purposes of identification, maintenance standards, and enforcement of traffic laws and for the purposes of applicable sections of this title. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, § 82.)

§ 2012. Public-Private Initiatives Program Revolving Loan Fund.

(a) Establishment of Fund. -- There is hereby established a Public-Private Initiatives Program Revolving Loan Fund which shall be maintained and administered by the Department in accordance with the provisions of this chapter and such rules as the Department may from time to time prescribe. The Fund shall be available for the purpose of providing financial assistance in accordance with the provisions of this section. Subject to the provisions of any applicable bond resolution governing the investment of bond proceeds deposited in the Fund, the Fund shall be invested and reinvested in the same manner as other State funds. The Fund shall retain any investment earnings. Subject to the provisions of any applicable bond covenants or resolutions or any other applicable laws or regulations governing the Fund, the Department may, with the approval of the Delaware General Assembly, transfer monies from the Fund to the Transportation Trust Fund.

(b) Fund deposits. -- The following shall be deposited in the Fund:

(1) Federal grants and awards or other federal assistance received by the State for the purpose of deposit therein and eligible for deposit therein under applicable federal law;

(2) State funds appropriated for deposit to the Fund;

(3) Payments received from any public or private agency in repayment of a loan previously made from the Fund or pursuant to 23 U.S.C. 129(a)(7) or successor legislation;

(4) Net proceeds of bonds approved by the Delaware General Assembly which have been designated by the Delaware General Assembly for deposit in the Fund;

(5) Interest or other income earned on the investment of moneys in the Fund; and

(6) Any additional moneys made available to the Fund by the Secretary from any sources, public or private, including excess toll revenues, with the approval of the General Assembly for the purposes for which the Fund has been established.

(c) Accounting of deposits. -- In order to facilitate the determination of the amount of funds available for financing Projects which meet either federal eligibility criteria or state eligibility criteria but not both, deposited funds commingled in the Fund shall also be accounted for separately based on whether their source is federal or state.

(d) Permitted uses of funds. -- Amounts in the Fund may be used only:

(1) To make loans for the construction, reconstruction, resurfacing, restoring,

rehabilitation or replacement of public or private toll transportation facilities or other transportation systems within the State, or the study of the feasibility thereof;

(2) To guarantee, or purchase insurance for, bonds, notes or other evidences of obligation issued by the contracting party developing a public or private toll facility or other transportation system for the purpose of financing all or a portion of the cost of such toll facility or system, if such action would improve the credit market access of the contracting party or reduce interest rates payable by such party;

(3) To earn interest on Fund accounts;

(4) For the reasonable cost of administering the Fund; and

(5) To be used for any purpose authorized by this chapter.

(e) Terms of loan agreements. -- The following terms shall apply to all loans made from the Fund:

(1) Loans shall bear interest at the average rate of interest earned by the State's pooled investment fund for the period beginning with the 1st month following the date that the loan is funded and ending on the last day of the month preceding the start of repayment; provided, however, that in the event the Department funds a loan with the proceeds of a bond issue, the rate of interest charged shall be no less than the cost the Department incurs to borrow such funds irrespective of the average rate of interest earned by the State's pooled investment funds;

(2) Loan repayment shall begin no later than 5 years from the date that the facility or system is opened to toll traffic and shall be completed by no later than 30 years from the time the loan was obligated;

(3) The loan may be subordinated to other debt financing except for loans made by any other public agency; and

(4) Reasonable origination or processing fees may be charged. (70 Del. Laws, c. 280, § 1; 74 Del. Laws, c. 69, §§ 97, 98.)

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**Appendix 2-C:
Economic Impact Assessment Update**

UPDATED ECONOMIC IMPACT EVALUATION

This appendix provides a summary of the updated economic impact evaluation of Delaware airports and aviation. The 1999 study was updated to include this information. It will be used in statewide economic impact assessment literature and educational videos.

To adequately measure economic impacts, an analysis that follows an industry-wide accepted methodology was used in this update. That methodology first identifies the direct spending and employment at airports (called direct impacts) and includes the direct spending at off-airport sites such as hotels and restaurants. Armed with this information, regional multipliers are applied to the data to determine the multiplied impacts of direct spending (called induced impacts). The technical processes involved in developing the analysis included the following:

- Direct Impacts
- Induced Economic Impacts
- Application to Delaware Aviation
- Other Key Outputs

1. DIRECT IMPACTS

By way of definition for this study, direct impacts are associated with *providers* and *users* of services at an airport. They are immediate consequences of airport economic activity. The value of direct impacts is the sum of all payroll, capital expenditures, operating and maintenance costs, taxes, and fees incurred by providers of services at the airport. The value of off-airport direct impacts is the sum of the fees and charges paid, time and cost savings, expenses related to food, lodging, ground transportation, and similar outlays.

The collection of data concerning direct impacts is essential for the accurate assessment of overall economic impacts of aviation. That is why time and effort were expended to survey 2 different components of aviation in Delaware: on-airport businesses and employers and airport users. Response to these surveys varied by airport, but overall, much valuable information was collected. In some cases, extrapolation of the survey information was needed to cover non-respondents. For example, aircraft tenants of airports were asked to specify their spending on their aircraft. From this statewide pool of information, averages for single-engine and multi-engine aircraft could be compiled and extrapolated for non-respondents.

1.1 Estimation of Direct Impacts

There were a number of ways that the direct impacts of aviation in Delaware were estimated. These included surveys, published data, and extrapolated results. From the surveys, specific questions were asked concerning on-airport spending and employment. This spending comes from one of three primary sources: the airport sponsor/management, on-airport businesses and employers, and based aircraft tenants. From published data, information regarding average wages and labor cost components in various industries was collected. Both the survey data and the published data could be interpolated and extrapolated to estimate direct impacts of aviation.

On-Airport Employer Survey

The On-Airport Employer Survey was distributed to all employers located on Delaware airports. Responses were screened by asking whether or not the business was aviation related. If the business had no requirement for aviation, its location on the airport was not an essential aspect of its operation and thus, it was not included in the survey data base. Responses that were applied to the study's catalogue of impacts were limited to those companies or employers that needed the airport in some way in order to operate effectively. Employers like Fixed Base Operators, corporate flight departments, the Air National Guard, and so on, were included in the aviation-related impact base. Key questions asked in this survey included the number of full and part-time employees, the annual gross sales volume, estimated annual expenditures, and total estimated payroll. The direct economic impact of these employers could be measured from the responses.

Airport User Survey

Direct economic impacts of based aircraft tenants were assessed through a survey questionnaire. In addition to activity levels and business/personal use questions, the survey asked about the level of spending for fuel, maintenance, storage, and "other" expenses. In addition, the aircraft type was recorded so that statewide or airport level averages could be developed on the basis of the size of the aircraft. With a knowledge of an airport's fleet mix, these averages could then be applied to non-respondents at that airport.

To estimate the individual economic impact of air transportation visitors using Delaware airports, the number of annual visitors was multiplied by a per diem expense level times the average length of stay. The per diem amount utilized within this report was taken from information provided by the Travel Industry Association's TravelScope Delaware. Their surveys found that the average expenditure of each visitor in the area totaled \$270 during an visit. Therefore, the \$270 figure was used to calculate indirect aviation impacts of each air visitor using Delaware airports.

2. INDUCED ECONOMIC IMPACTS

Induced economic impacts are the *multiplied effects* of the direct and indirect impacts. Induced impacts are created by the successive rounds of spending in the local economy until the original direct or indirect impact has been incrementally exported from the local area. Thus, the economic impacts of aviation can be felt in parts of Delaware's economy that are far removed from aviation. Regions that are more economically self-sufficient have higher responding "multipliers" than do regions that are more dependent on regional imports since less of the money is siphoned out of the community for goods and services.

The effects of induced economic impacts can be demonstrated through the following example. A new firm opens up in Delaware, generating 200 new jobs, most of them filled by local residents. At the end of the year, the regional labor office notes that employment has risen by 350 – yet only 200 new jobs were created. Why did an additional 150 jobs appear in the State? The process by which these jobs were created is known as the multiplier or ripple effect and is a result of several factors – the new firm making purchases of inputs from other firms in the region (thereby

generating additional output and potentially employment) as well as the impacts of the expenditures of wages and salaries earned by the 200 new employees. It would be a tedious and difficult process to trace the impacts on a case by case study. Fortunately, an accounting system and associated model exists to make this more feasible. To adequately describe the model and analytical processes, this section is organized to include the following:

- The Input-Output Accounting System
- Input-Output Model Demonstration.
- Input-Output and Social Accounting
- IMPLAN software

2.1 Input-Output Accounting System

A typical region with m firms, produces a whole array of goods and services from agriculture, to food processing, to manufacturing, to personal and business services and government. Tracing all the detailed transactions between these firms would be a daunting task; hence, firms are assigned to n broad sectors based on their principal product. The number of sectors, n , ranges from 50 to several hundred and the allocation conforms to the Standard Industrial Classification (SIC). For this presentation, only 5 sectors will be shown to facilitate the analysis and to avoid getting bogged down in details.

The transactions between these sectors are arrayed in a matrix (n rows and n columns), as shown in Table C-1. Looking across the *rows*, the sales made by the firm at the left can be traced to firms listed at the top of the column. Thus sector 3 sells \$3 m to sector 1, \$20 m to sector 2, \$50 m to sector 4 and so forth. The *columns* provide complementary information of the source of purchases made by the sector at the top of the column from all other sectors. Again, following sector 3, note that it buys \$9 m from sector 1, \$7 m from sector 2, \$38 m from sector 4 and \$26 m from sector 5. This part of the input-output table is referred to as the *interindustry transactions*; it provides an *economic photograph* of the ways in which one sector is linked to another sector.

Table C-1 - The Input-Output Accounting System											
		Interindustry Transactions (Millions of \$)					Final Demand (Millions of \$)				
							Households	Government	Exports	Total Final Demand	Total Sales
	Sector	1	2	3	4	5	6	7	8	9	10
1	1	21	0	9	3	0	30	15	22	67	100
2	2	1	8	7	29	0	25	7	23	55	100
3	3	3	20	0	50	7	5	9	6	20	100
4	4	31	2	38	0	3	12	13	1	26	100
5	5	10	25	26	1	4	9	19	6	34	100

Table C-1 - The Input-Output Accounting System											
		Interindustry Transactions (Millions of \$)					Final Demand (Millions of \$)				
							Households	Government	Exports	Total Final Demand	Total Sales
6	Total Intermediate	66	55	80	83	14	81	63			
7	Value Added	20	40	10	17	40	2	62			
8	Imports	14	5	10	0	46	77	55			
9	TOTAL INPUTS	100	100	100	100	100	160	180			

However, sectors also make sales to other sets of activities – consumers, government and to customers located outside the region (exports). In addition, firms also make purchases of labor (wages and salaries), returns to capital (profits and dividends) and imports. The sum of wages and salaries and profits and dividends (returns to labor and capital) are referred to as *value added*. These are shown in row 7 while *imports* has its own row (8). The columns 6-8 (aggregated in column 9) are referred to as *final demand*; rows 7 and 8 are referred to as primary inputs.

2.2 The Input-Output Model Demonstration

Table C-1 is basically an accounting system – a double entry one similar to that prepared for a business in which sales and purchases or assets and liabilities will be shown but, in this case, for a regional economy. The next step is to prepare an economic model so that the impact of changes in one sector can be traced on the rest of the economy. The reason for doing this rather than assuming that all sectors will have the same impact is because the nature of dependence on the regional economy and interdependence among sectors varies.

It can be assumed that each sector produces goods and services according to a fixed recipe (formally known as a production function); hence, to produce \$1 m worth of steel, it is assumed that a fixed proportion will be allocated to limestone, iron ore, scrap, energy, coke, labor and so forth. Inputs are expressed in monetary terms since it would be difficult to combine tons of iron ore with megawatts of electricity, or hours of labor in some consistent fashion. This fixed recipe permits expression of the transactions in proportional form, known as *direct coefficients*. These are shown in Table C-2. A simple case was used in which each sector's output was \$100 m (in reality, each sector's production will be very different). To obtain the direct coefficients, the entries in the 5 x 5 part of Table C-1 are divided by 100. It is further assumed that these proportions are invariant with levels of production (i.e., no economies of scale). The final assumption is that the economy is driven by signals emanating from final demand (consumers, government, exports). This is the *exogenous* part of the economy, while the interindustry transactions respond to these signals and are therefore *endogenous*.

Table C-2 - The Direct Coefficients Matrix					
Sector	1	2	3	4	5
1	0.21	0.00	0.09	0.03	0.00
2	0.01	0.08	0.07	0.29	0.00
3	0.03	0.20	0.00	0.50	0.07
4	0.31	0.02	0.38	0.00	0.03
5	0.10	0.25	0.26	0.01	0.04

In a mathematical sense, the input-output model can be defined by a series of equations. Using the simplified format from the Table C-1:

- Let T be the matrix of transactions in the 5x5 part of Table C-1;
- Let f (nx1) be the aggregation of final demand and
- Let x be the vector (nx1).

The accounting yields the following:

$$T+f=x \tag{1}$$

Define R as the matrix of coefficients (Table C-2); by definition:

$$T=Rx \tag{2}$$

Substituting for T back into equation (1), yields the following:

$$Rx+f=x \tag{3}$$

Solving for x , yields the following:

$$x= [I - R]^{-1}f \tag{4}$$

Equation (4), therefore, represents the basic driving mechanism of the regional economy. Final demand, f , generates total output x , but expanded by the value $[I - R]^{-1}$. The latter is the essence of the input-output model and is known as the *Leontief inverse matrix*, named after the founder of input-output analysis, who was awarded the Nobel Prize in economics for his efforts. This matrix is shown in Table C-3. The entries reveal the direct and indirect impacts on a sector when final demand in the sector at the top of the column changes by \$1 (or \$1 million or \$100 million). Moving down column 3, it was noted earlier that sector 3 purchased \$0.09 for every \$1 of production from sector 1. However, as a result of this, sector 1's production increases and this, in turn, generates additional demands on other sectors and eventually some of these sectors will require inputs from sector 1. Thus, the difference between 0.09 in Table C-2 and 0.18 in Table C-3 represents the *indirect impact*. Moving down the rest of column 3 and comparing the entries with those in Table C-2, it is noted that the entry on the principal diagonal is always >1. The unit value represents the increase in final demand in that sector. The remaining portion is the direct and indirect impact of expansion.

Table C-3 - The Leontief Inverse (Multiplier) Matrix					
SECTOR	1	2	3	4	5
1	1.33	.05	.18	.15	.02
2	.23	1.17	.3	.50	.04
3	.4	.36	1.41	.82	.13
4	.58	.19	.61	1.38	.09
5	.31	.41	.48	.38	1.09
Multiplier	2.85	2.18	2.98	3.23	1.37

At the bottom of Table C-3 there is a row labeled “multiplier.” It should be noted that these values vary from 1.37 (sector 5) to 3.23 (sector 4). How should these entries be interpreted? Essentially, they provide information on the impact on the rest of the economy (including the sector in question) of a unit change in final demand in any sector. The value 2.98 for sector 3 explains that for every increase of \$1 in that sector an additional 1.98 worth of activity is generated for a total value of production of 2.98. Why do these values vary? In large part, they reflect the degree to which a sector is dependent on other sectors in the region for its inputs and as a source of consumption for its products. It would be incorrect to assume that a sector’s importance in the economy is directly related to the size of the multiplier. While true in part, a sector with a large volume of production but a modest multiplier may generate a greater volume of activity in the region than the sector with the largest multiplier but a smaller volume of production.

There are several additional multipliers that can be calculated. For example, when a sector expands production, it will increase payments to labor generating additional wages and salaries that will be spent in the region. Further, other industries whose production has to expand to meet these new demands will also spend more on wages and salaries. Thus, an income multiplier may be generated that reveals the relationship between direct income generation and total income (in similar fashion to output). The analysis could also be transformed into employment terms. Referring back to the opening section, it becomes clear why 350 jobs were created in total when only 200 direct jobs were created. The secret is the multiplier process!

Multipliers vary not only across sectors but also across regions. A small regional economy, with a modest representation of industry, may not be able to provide all the necessary inputs required by local industry. Thus, there will be considerable importation of inputs (sometimes referred to as leakages). In general, the larger the value of the imports, the lower the value of the multiplier. The value of multipliers could be expected to decrease as the economic region under consideration gets smaller. Thus moving from the US as a whole to a census region, an individual state, a metropolitan region and finally to a county would result in smaller and smaller multiplier values. However, there are a few cases in which this finding is not confirmed – cases in which a region may have a significant representation of a particular sector.

2.3 Social Accounting Systems

The input-output system simplifies the transactions that take place in an economy by focusing on industry-to-industry activities. However, there may be other important transactions that an analyst would like to explore – those between the government and consumers (taxes, transfers such as unemployment compensation, welfare), between firms and government (such as business taxes) or between consumers and firms (dividends from stock ownership). These so-called institutional transactions are captured in the social accounting matrix. It can be thought of as an expanded input-output system in which some of the entries in the primary inputs and final demand section of Table C-1 are expanded to capture the transactions just noted. This process makes more activities endogenous and, concomitantly, less activities exogenous.

With a social accounting system, the multipliers tend to be larger than those derived from the input-output system alone. This stems from the fact that more activities have become endogenous to the accounting system, thus circulating impacts more times before they are exported out. It should be noted that contained within the social accounting system is the input-output transactions from Table C-1.

2.4 IMPLAN Software

IMPLAN, developed originally by the US Forest Service, is a comprehensive impact system that is built on the framework on input-output and social accounting methodology. The database is maintained at the county level, affording the analyst an opportunity to create regions for study that are aggregations of counties. The database includes the latest business censuses (2003) supplemented by County Business Patterns and other data derived from the Bureau of Economic Analysis.

The input-output and social accounting models are derived from national data with adjustments made to reflect regional specialization, size and industrial composition. The procedures used to accomplish this are well-known and accepted in the literature on nonsurvey techniques. Since IMPLAN provides a much more comprehensive system (i.e., the complete input-output table or social accounts, in contrast to RIMS II and EIFS that only provide aggregate multipliers), it is possible to trace impacts of change in one sector on other sectors in a more detailed fashion. The IMPLAN software permits users to:

- Develop a complete set of social account matrices
- Develop user-specified multiplier tables
- Change any component of the system: production functions, trade flows, or database
- Create custom impact analyses by entering final demand changes
- Obtain any report in the system to examine the model's assumptions and calculations

In addition, the IMPLAN databases are composed of the following components:

- Employment;

- Industry Output;
- Value Added
 - Employee Compensation;
 - Proprietary Income;
 - Other Property Type Income;
 - Indirect Business Taxes;
- Institutional Demands
- Personal Consumption Expenditures (PCE) - three income levels;
- Federal Government Military and Non-Military Purchases;
- State and Local Government Education and Non-Education Purchases;
- Commodity Credit Corporation;
- Inventory Purchases;
- Capital Formation;
- Foreign Exports;
- Federal, State and Local Government Sales;
- Inventory Sales.
- National Structural Matrices
 - Use
 - Make
 - Inter-Institutional Transfers (SAM)

The ability to edit data makes IMPLAN a dynamic economic modeling tool. Software users have the ability to edit all underlying data, from value added, employment, and final demands to production functions, byproducts, and regional purchase coefficients - and many other components.

3. APPLICATION TO DELAWARE AVIATION

The final step in the analytical process of regional economic impact analysis is the estimation of the induced or multiplied effects of Delaware's direct and indirect aviation impacts. Using the IMPLAN software, extended input-output tables were generated for each Delaware county and for the state as a whole. From these tables, an impact model was developed and used to ascertain the ripple effects associated with each specific airport-related activity. One advantage of the IMPLAN system is the detailed sectors that are available, which enable very specific mapping of the survey results into the appropriate sector. Since each sector of the economy has a different set of linkages with other sectors in the economy, the multipliers will also vary by sector. Thus airport expenditures and tourism expenditures will enter the economy through different sectors and thereby circulate through different paths in accumulating ripple effects.

This section provides a summary of each airport's direct, indirect, and induced economic impacts. In addition, there is a discussion of market potential and future economic development at each airport. This documentation is the culmination of work involving the survey data, the secondary source data, and the IMPLAN multipliers in determining the economic impact of Delaware airports.

3.1 Chandelle Estates Airport

Chandelle Estates Airport (0N4) is located 3 miles northeast of Dover in an agricultural and light residential area. The Airport has a paved runway 2,533 feet in length by 28 feet in width. There are significant displacements of runway thresholds on both runway ends caused by trees. These displacements result in a reduced useable runway length. Any expansion of the runway would be difficult due to physical constraints of a highway at one end and woodlands at the other. The Airport is populated mostly by single engine aircraft that are flown for personal use. There are currently 22 single-engine aircraft based at the airport. The airport serves a local set of pilots who use the facility primarily as a recreational and training facility, with relatively minor business use. The primary economic activities on the airport involve flight training, the sale of aircraft fuel and oil, rental of hangar and tie-down space, and aircraft maintenance. In addition, the Airport serves as a base for some crop spraying operations and powerline surveillance.

For the future, it is likely that the facility will continue in its present role until ownership changes or the airport is converted to a different use. The Airport serves a function by accommodating aircraft in hangars and tie-downs that would otherwise be needed at other central Delaware airports. In this regard, the Airport serves to increase the overall capacity of the State's airport system without cost to any public unit of government.

The economic impact of the airport includes direct and induced components of output, employment and income. Table C-4 presents a summary of each of these components of economic impact for Chandelle Estates Airport.

Table C-4 - Direct and Induced Economic Impacts: Chandelle Estates Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$63,000
Airport Related Expenditures (Total including capital costs)	\$128,500
Airport Related Employment (Total including capital development)	2
Induced Impacts**	
Induced from Direct Spending	\$51,900
Total Induced Employment Impact	
Estimated State/Local Taxes	\$6,700
Grand Total Dollar Impacts	\$180,400
Grand Total Income Impacts*	\$83,800
Grand Total Employment Impacts	2

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.2 Chorman Airport

Chorman Airport (D74) is located 2 miles southwest of Farmington in a mostly agricultural area. The Airport is the most recent private use facility to become public use in Delaware. It has one runway - a 3,588 foot by 37 foot paved surface. The Airport has 19 based aircraft, 17 single-engine and 2 multi-engine propellor aircraft. Key economic and business activities that occur at the Airport include crop spraying and aircraft maintenance. As a privately owned airport, the crop spraying business is operated by the airport owner, with maintenance work provided by Abbots Aero Services, Russell Aircraft Refurbishing, and Hangar 6 Aircraft Service. The bulk of aircraft operations at the Airport are in support of the crop spraying operation. However, there is an increased use of the airport for weekend training and other business and personal flying operations.

For the future, the Airport desires to expand its based aircraft totals by constructing new aircraft storage space. Long term plans by the owners are to improve safety set back distances for the runway and terminal area buildings and develop a substantial number of new hangar units. There is a young and energetic management that will likely expand the business function of the airport within its market niche. At least 5 aircraft are currently used in the aerial spraying operation. The Airport serves a function by accommodating aircraft in hangars and tie-downs that would otherwise be needed at other central Delaware airports. In this regard, the Airport serves to increase the overall capacity of the State's airport system without cost to any public unit of government.

The economic impact of the airport includes direct and induced components of output, employment and income. Table C-5 presents a summary of each of these components of economic impact for Chorman Airport.

Table C-5 - Direct and Induced Economic Impacts: Chorman Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$496,700
Airport Related Expenditures (Total including capital costs)	\$1,734,000
Airport Related Employment (Total including capital development)	12
Induced Impacts**	
Induced from Direct Spending	\$781,000
Total Induced Employment Impact	4
Estimated State/Local Taxes	\$120,700
Grand Total Dollar Impacts	\$2,515,000
Grand Total Income Impacts*	\$658,800
Grand Total Employment Impacts	16

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.3 Delaware Airpark

Delaware Airpark (33N) is located 1 mile west of Cheswold and 5 miles northeast of Dover, in an agricultural and residential area. The Airport is operated by the Delaware River and Bay Authority (DRBA). The Airport has one runway - a 3,582 foot by 60 foot paved surface. The Airport is populated by a variety of aircraft types including 43 single engine aircraft, 2 twin engine aircraft, and 1 rotorcraft.

In August of 2000, the State of Delaware's Department of Transportation purchased Delaware Airpark with the agreement and understanding that DRBA would operate the facility on a long term basis. This would insure permanent public general aviation transportation access to central Delaware. Under DRBA operation, the mission of the Airpark is focused on business and economic development.

Key economic and business activities that occur at the Airport include the flight training operation of Delaware State University, a specialty FBO that works on one type of aircraft (Beechcraft Bonanzas), a paint shop, and flight instruction. Other business aviation activities at the Airport include crop spraying, tourism, and some business/corporate use of aircraft. Of these activities, perhaps the most visible is the Delaware State University flight training operation. Under this program, the University has contracted with the military to train pilots in ROTC and aerospace programs and has close to 20,000 operations annually. The DRBA is currently looking to add an aircraft maintenance shop to the facility.

For the future, the Airport is in the process of expanding its runway system with the development of a new 4,200 foot runway parallel and 400 feet to the north of the existing runway. Land acquisition for this project has already begun. It can be anticipated that facilities will be upgraded to accommodate business aircraft in all-weather conditions. In addition, some needed facility capital maintenance will occur as the Airport infrastructure continues to be modernized. Delaware Airpark's market will be identified and expanded as businesses in central Delaware learn of investment and improvements at the facility.

The economic impact of the airport includes direct and induced components of output, employment and income. Table C-6 presents a summary of each of these components of economic impact for Delaware Airpark.

Table C-6 - Direct and Induced Economic Impacts: Delaware Airpark	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$893,200
Airport Related Expenditures (Total including capital costs)	\$2,656,200
Airport Related Employment (Total including capital development)	30
Induced Impacts**	
Induced from Direct Spending	\$954,400

Table C-6 - Direct and Induced Economic Impacts: Delaware Airpark	
Item	Total Current Impacts
Total Induced Employment Impact	15
Estimated State/Local Taxes	\$137,400
Grand Total Dollar Impacts	\$3,610,600
Grand Total Income Impacts*	\$1,261,700
Grand Total Employment Impacts	45

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.4 Jenkins Airport

Jenkins Airport (15N) is located 1 mile west of the city of Wyoming in a mostly agricultural area. The Airport is not paved and is surrounded by open fields and some residential development. The airport has significant infrastructure, with one turf runway (2,842 feet by 70 feet) and another turf crosswind runway (2,035 feet by 70 feet). The Airport is populated mostly by single engine aircraft that are flown for personal use. The current fleet mix includes 18 single-engine aircraft, and 1 multi-engine aircraft. The airport is used primarily as an aircraft salvage and parts operation. Jenkins Aircraft Parts buys old or damaged aircraft and salvages parts from those aircraft for use in the repair of other aircraft in the region and across the nation. The business continues to grow as its name is recognized in more market areas. The Airport also serves a local set of pilots who use the facility primarily as a recreational and training facility, with relatively minor business use. In addition to the salvage operation, other economic activities on the airport include the sale of aircraft fuel and oil, rental of hangar and tie-down space, and minor aircraft maintenance. The owner of the Airport has operated the facility for more than 50 years and does not expect to change the mission or operational character of the airport.

For the future, it is likely that the facility will continue in its present role until ownership changes or the airport is converted to a different use. The changing nature and growth of residential housing in the area may apply economic pressure to produce higher rates of return from the Airport in the future, however, that is more likely to occur in the intermediate or long range future rather than the near term. The Airport currently serves a number of economic functions, the first of which is the accommodation of a unique business on the airport - aircraft salvage and parts recovery. In addition, the Airport provides storage space for aircraft in hangars and tie-downs that would otherwise be needed at other central Delaware airports. In this regard, the Airport provides an increase in the overall capacity of the State's airport system without cost to any public unit of government.

The economic impact of the airport includes direct and induced components of output, employment and income. Table C-7 presents a summary of each of these components of economic impact for Jenkins Airport.

Table C-7 - Direct and Induced Economic Impacts: Jenkins Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$43,000
Airport Related Expenditures (Total including capital costs)	\$87,700
Airport Related Employment (Total including capital development)	2
Induced Impacts**	
Induced from Direct Spending	\$35,400
Total Induced Employment Impact	
Estimated State/Local Taxes	\$4,600
Grand Total Dollar Impacts	\$123,100
Grand Total Income Impacts*	\$57,200
Grand Total Employment Impacts	2

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.5 Laurel Airport

Laurel Airport (N06) is located 1 mile southwest of the city in an agricultural area. The Airport is not paved and is surrounded by open fields and some residential development. The Airport has one turf runway - a 3,175 foot by 270 foot runway. Any expansion would be difficult due to physical constraints of a highway at one end of the runway (State Highway 24) and property boundaries at the other runway end. The Airport is populated by mostly by single engine aircraft (13 aircraft) and 1 twin engine aircraft. The Airport's primary economic activity is directed toward parachute jump training, with other business and personal use activities as well. The parachute training is significant, attracting over 1,000 sky-divers to the airport each year. The training and jump season extends roughly 8 months per year with peak activity occurring the in summer months. Local hotels, restaurants, and other retail outlets benefit from the attraction of weekend sky divers. It is estimated that the Airport generates approximately 2,000 hotel room stays each year, with significant numbers of purchased meals at area restaurants. The twin engine aircraft is used in the sky-diving/parachute training operation. Other business and economic activities at the Airport include aircraft maintenance, a crop spraying operation, sale of aircraft fuel and oil, and rental of hangar and tie-down space. The Airport is operated by a partnership of principals involved in the parachute training, aircraft maintenance, and aerial spraying activities of the Airport.

For the future, there are no plans to change the mission or operational character of the airport. The Airport serves a niche market and has established a name within the sky-diving community. This keeps activity constant or growing each successive year. In addition to the parachute training, the Airport provides a base of operation for a significant crop spraying operation (4 aircraft), an aircraft maintenance business, and as the home base for 10 other aircraft. The Airport serves a geographic area in Delaware devoid of other aviation facilities and thus increases the

overall capacity and coverage of the State’s airport system without cost to any public unit of government.

The economic impact of the airport includes direct and induced components of output, employment and income. Table C-8 presents a summary of each of these components of economic impact for Laurel Airport.

Table C-8 - Direct and Induced Economic Impacts: Laurel Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$842,000
Airport Related Expenditures (Total including capital costs)	\$2,180,800
Airport Related Employment (Total including capital development)	16
Induced Impacts**	
Induced from Direct Spending	\$941,100
Total Induced Employment Impact	11
Estimated State/Local Taxes	\$187,800
Grand Total Dollar Impacts	\$3,121,900
Grand Total Income Impacts*	\$1,158,400
Grand Total Employment Impacts	27

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.6 New Castle Airport

New Castle Airport (ILG) is located 4 miles south of Wilmington in an industrial, commercial, and residential area. The Airport is operated by Delaware River & Bay Authority (DRBA). The 1,250 acre Airport has three runways, twelve taxiways, and several aircraft parking ramps. The runways include:

- 7,181 foot by 150 foot asphalt surface runway (9/27)
- 7,012 foot by 150 foot asphalt surface runway (1/19)
- 4,603 foot by 150 foot asphalt surface runway (14/32).

The availability and length of the longest runways are sufficient to accommodate the largest business jet aircraft in the nation’s fleet. As a result, a number of Fortune 500 companies, including Boeing, Campbell’s Soup, DuPont, CitiCorp, and W.L. Gore are based at the Airport. In all, there are 66 business jets that are located on the Airport. Other aircraft types located at the facility include 167 single engine aircraft, 24 twin engine aircraft, 16 rotorcraft, and 9 military aircraft.

New Castle Airport remains today as the only public airport in Delaware with airline service (Delta Airlines), an air traffic control tower, and instrument landing system (ILS). The Airport has three full service FBOs: AeroTaxi, AvCenter-Wilmington, and Dassault Falcon Jet. Combined, these providers offer 72 T-Hangars and 30 aircraft tie down spaces and allow the DRBA to offer one of the largest and most complete general aviation service airports on the east coast.. The airport has 75 tenants ranging from major corporate clients to individual aircraft owners. Some of the on-airport businesses are not aviation related and thus were not included in our estimates of employment, income, and dollar output. Major employers on the airport include Fixed Base Operators, Flight Safety International (a pilot and mechanic training facility), and the Army and Air National Guards. Other large employers include the corporate flight departments of the Fortune 500 companies based at the Airport.

For the future, the DRBA is charged with a mission of economic development. Therefore, it can be anticipated that enhancement of airline service will be a priority. In addition, new corporate facilities will continue to be constructed to accommodate business and corporate aviation. As will all large airports, some needed facility capital maintenance will occur as the Airport runway infrastructure is improved. The economic impact of the Airport includes direct and induced components of output, employment and income. Table C-9 presents a summary of each of these components of economic impact for New Castle Airport.

Table C-9 - Direct and Induced Economic Impacts: New Castle Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$66,859,600
Airport Related Expenditures (Total including capital costs)	\$200,062,700
Airport Related Employment (Total including capital development)	1,817
Induced Impacts**	
Induced from Direct Spending	\$72,048,300
Total Induced Employment Impact	644
Estimated State/Local Taxes	\$8,805,800
Grand Total Dollar Impacts	\$272,111,000
Grand Total Income Impacts*	\$92,908,500
Grand Total Employment Impacts	2,461

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.7 Smyrna Airport

Smyrna Airport (38N) is located 1 mile east of the city of Smyrna in an agricultural area. The Airport is not paved and is surrounded by open fields and wetlands. The current runway is 2,600 feet in length by 125 feet in width. Any expansion would be difficult due to physical

constraints. The Airport is populated entirely by single engine aircraft that are flown for personal use. The current fleet mix is limited to 6 single-engine aircraft. The Airport serves a local set of pilots who use the facility primarily as a recreational and training facility, with relatively minor business use. The primary economic activities on the Airport involve the sale of aircraft fuel and oil, rental of hangar and tie-down space, and minor aircraft maintenance. The owner of the Airport has operated the facility for more than 50 years and does not expect to change the mission or operational character of the Airport.

For the future, it is likely that the facility will continue in its present role until ownership changes or the airport is converted to a different use. The changing nature and growth in Smyrna may apply economic pressure to produce higher rates of return from the Airport in the future, however, that is more likely to occur in the intermediate or long range future rather than the near term. The Airport serves a function by accommodating aircraft in hangars and tie-downs that would otherwise be needed at other central Delaware airports. In this regard, the Airport serves to increase the overall capacity of the State's airport system without cost to any public unit of government.

The economic impact of the Airport includes direct and induced components of output, employment and income. Table C-10 presents a summary of each of these components of economic impact for Smyrna Airport.

Table C-10 - Direct and Induced Economic Impacts: Smyrna Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$26,000
Airport Related Expenditures (Total including capital costs)	\$60,300
Airport Related Employment (Total including capital development)	1
Induced Impacts**	
Induced from Direct Spending	\$23,500
Total Induced Employment Impact	
Estimated State/Local Taxes	\$3,100
Grand Total Dollar Impacts	\$83,800
Grand Total Income Impacts*	\$35,300
Grand Total Employment Impacts	1

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.8 Summit Airport

Summit Airport (EVY) is located 5 miles north of the city of Middletown in an agricultural and increasingly residential development area. The Airport has significant infrastructure, with one paved runway (4,487 feet by 65 feet) and one turf crosswind runway (3,600 feet by 200 feet). It is

the largest privately owned airport in Delaware, occupying over 209 acres. Some expansion of the primary runway is possible and may be undertaken in the near future. This expansion would extend the runway to 5,300 feet and would increase safety margins for larger aircraft.

The Airport is populated mostly by a variety of aircraft types including 63 single engine aircraft, 6 multi-engine propeller aircraft, and 7 rotorcraft. The airport's primary economic activity is directed toward airframe, engine, and avionics maintenance and overhaul. Employment of approximately 83 is directed toward these on-airport activities. Aircraft from all across the nation are brought to Summit Airport each year for maintenance, avionics, and modification. Other business activities that take place on the airport include aircraft interior refurbishment, aerial crop spraying, corporate aviation, and fuel sales. In addition, the State Police helicopter base of operation of northern Delaware is located at the Airport with 7 employees. This base includes a hangar facility and 3 helicopters which are medevac equipped.

The Airport is working to maintain and improve relations with its neighbors, as the area surrounding the Airport continues to increase in residential development. The Airport was classified as a general aviation reliever facility and as such, received federal grants for facility improvements. Having received federal funding, the airport is eligible for future federal funding, even though it is privately owned. This will ensure that the Airport has access to adequate capital development funding as long as federal grants are provided.

For the future, there are no plans to change the mission or operational character of the airport. The Airport serves a broad market and has established a name within the aircraft maintenance, avionics, and overhaul business market. Because the Airport is privately owned, the Airport Sponsor provides all aircraft services offered on the facility. This arrangement is not expected to change in the future.

The economic impact of the Airport includes direct and induced components of output, employment and income. Table C-11 presents a summary of each of these components of economic impact for Summit Airport.

Table C-11 - Direct and Induced Economic Impacts: Summit Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$4,890,000
Airport Related Expenditures (Total including capital costs)	\$17,855,600
Airport Related Employment (Total including capital development)	100
Induced Impacts**	
Induced from Direct Spending	\$10,141,500
Total Induced Employment Impact	94
Estimated State/Local Taxes	\$1,313,400
Grand Total Dollar Impacts	\$27,997,100
Grand Total Income Impacts*	\$8,353,200

Table C-11 - Direct and Induced Economic Impacts: Summit Airport	
Item	Total Current Impacts
Grand Total Employment Impacts	194

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.9 Sussex County Airport

Sussex County Airport (GED) is located 2 miles southeast of the city of Georgetown in an agricultural and industrial development area. The Airport has significant infrastructure, with one paved runway (5,000 feet by 150 feet) and another short crosswind runway (2,330 feet by 50 feet). There is an active program to lengthen the longer runway by 1,000 feet to increase safety and to accommodate corporate users and the Boeing Business Jet traffic to DeCrane Aircraft Systems Integration Group for modification. This runway extension will involve the closure and relocation of a roadway and the acquisition of property. The Airport is populated by a variety of aircraft types including 35 single engine aircraft, 15 multi-engine propeller aircraft, 4 business jets, and 2 rotorcraft. On-airport business activity attracts a steady flow of business jet aircraft to the airport as well.

The Airport's character has evolved over past several years toward a business friendly facility that seeks to expand on-airport employment. Many of the area's citizens and political leaders appreciate the economic benefits that accrue to the region as a result of airport employment. In this regard, the airport's primary economic activity is directed toward airframe modification, aircraft manufacturing, flight training, aircraft maintenance, and corporate aircraft storage. One of the largest employers on the Airport is DeCrane, Inc. with over 425 employees. DeCrane has 200,000 square feet of work space and they specialize in modifying fuel tanks on Boeing Business Jets as well as the installation of winglets. Other on-airport aviation employment is provided by the Delaware State Police in support of their southern Delaware helicopter medevac unit. In addition to aviation-related employment, the Sussex County Airport is home to an industrial park which supports 625 jobs.

The Airport has purchased land and easements designed to increase compatibility with airport neighbors and protect aircraft approaches from obstructions. For the future, continued business development and expansion of the Airport's client base is planned. The terminal building is relatively new with full restaurant facilities and meeting space. The Airport continues to market its strengths including an adjacent industrial park, its significant airfield infrastructure, and its location near Delaware beaches.

The economic impact of the Airport includes direct and induced components of output, employment and income. Table C-12 presents a summary of each of these components of economic impact for Sussex County Airport.

Table C-12 - Direct and Induced Economic Impacts: Sussex Airport	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$39,456,700
Airport Related Expenditures (Total including capital costs)	\$104,127,900
Airport Related Employment (Total including capital development)	461
Induced Impacts**	
Induced from Direct Spending	\$46,920,800
Total Induced Employment Impact	560
Estimated State/Local Taxes	\$7,554,800
Grand Total Dollar Impacts	\$151,048,700
Grand Total Income Impacts*	\$55,439,300
Grand Total Employment Impacts	1,021

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

3.10 Dover Air Force Base

Dover AFB (DOV) serves as one of the Air Force's East Coast heavy airlift military facilities. The Air Force Base is located three miles east of the City of Dover, Delaware, and covers more than 3,900 acres, has 2 runways and 1,700 buildings. Given the availability of 12,903 feet of runway length and large Lockheed C-5 Galaxy and C-17 aircraft, logistical support can be given to United States military forces around the world. During the Gulf War, Dover Air Force Base served as the primary airlift departure point from the United States to the Middle East. Logistical supplies and personnel were transported to and from Dover AFB during the conflict. Dover AFB now supports ongoing military operations in Iraq and elsewhere in the world. The 436th Airlift Wing is the active duty military force at Dover AFB. The 436th is the only combat-ready C-5 Galaxy wing capable of employing airdrop and special operations tactics in support of worldwide airlift. Dover AFB operates the largest aerial port in the US Department of Defense with its passenger terminal moving over 100,000 passengers per year. Dover AFB is also home to the Air Mobility Command Museum, which had more than 50,000 visitors in 2005.

The economic impact of the AFB includes direct and induced components of output, employment, and income. This data was provided by the military, with multiplier effects calculated by the consultant. Table C-13 presents a summary of each of these components of economic impact for Dover Air Force Base.

Table C-13 - Direct and Induced Economic Impacts: Dover Air Force Base	
Item	Total Current Impacts
Direct Impacts	
Airport Related Income*	\$307,909,700
Airport Related Expenditures (Total including capital costs)	\$370,515,700
Airport Related Employment (Total including capital development)	7,807
Induced Impacts**	
Induced from Direct Spending	\$133,385,652
Total Induced Employment Impact	3,904
Estimated State/Local Taxes	\$21,045,800
Grand Total Dollar Impacts	\$528,180,200
Grand Total Income Impacts*	\$434,152,700
Grand Total Employment Impacts	11,711

* Includes indirect incomes from visitor spending and capital development. This is a subset of the total impacts and is already included in the output number.

** Source: IMPLAN Software - Developed originally by the US Forest Service, it is a comprehensive impact system built on the framework of input-output and social accounting methodology.

Chapter 3: Forecast of Aviation Demand

FORECAST OF AVIATION DEMAND

THE FORECAST OF AVIATION DEMAND FOR THE State of Delaware stands as a foundation for subsequent recommendations of the State System Plan Update. Forecasts must be realistic to provide adequate justification for the airport planning and development being recommended. A forecast that is either too high or too low can jeopardize a project by affecting environmental and funding decisions. Therefore, it was important to quantify the aviation activity indicators that will be used in the development of facility recommendations, airport reference codes, noise analysis inputs, and financial priority rankings. This chapter documents the forecasting effort used to project aviation demand through the year 2025.

The development of the forecast incorporated the following elements:

- Role of the FAA's Terminal Area Forecasts
- Forecast Methodology
- Forecast of Airline Demand
- Forecast of General Aviation Demand
- Forecast of Military Operations
- Peak Month and Peak Hour Operations
- Summary of Aviation Demand Forecasts

Each of these topics are discussed below.

1. ROLE OF THE FAA'S TERMINAL AREA FORECASTS

The Terminal Area Forecast System (TAF) is the official forecast of aviation activity at FAA facilities. These forecasts are prepared annually to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public. The TAF includes forecasts for active airports in the National Plan of Integrated Airport System (NPIAS). In all, there are currently 3,527 airports included in the forecasting database.

Recent guidance from the FAA indicates that independent forecasts such as those generated by the SASPU must conform to the TAF in order to be approved for FAA funded projects. Locally developed forecasts for operations, based aircraft, and enplanements are considered consistent with the FAA's Terminal Area Forecasts if they meet the following criteria:

- All NPIAS Airports:
 - The forecast must differ by less than 10 percent in the 5-year forecast period and by 15 percent within the 10-year forecast period.
 - Forecast activity levels do not affect the timing or scale of an airport project.
- Commercial Service Airports other than Large, Medium, and Small Hub facilities, and General Aviation and Reliever Airports:
 - The forecast activity levels do not affect the role of the airport as defined in the NPIAS

- General Aviation and Reliever Airports:
 - Airports with under 100,000 annual operations or with less than 100 based aircraft are exempt from the 10 and 15 percent conformance rules.

Forecasts generated by this SASPU have been coordinated with the TAF and are consistent with the guidelines listed above.

2. FORECAST METHODOLOGY

There are three general methods of forecasting that were used in this study. They included:

- Share of the Market Projection
- Socioeconomic Regression Projection
- Trend Analysis Projection

In addition to these methods, this section discusses the role of judgmental input to the forecasting process. The goal of this process is to produce a simple, accurate method of projecting aviation demand. Each of these forecasting techniques along with a description of the role of judgmental input are briefly presented below.

2.1 Share of the Market Projection

Share of the market projections are developed by calculating historical shares of national or regional aviation activity and then projecting these respective shares into future time frames. By using the share of the market technique, regional or national trends can be reflected in the local forecasts. Socioeconomic and per capita projections, on the other hand, are usually based on local factors. Share of the market projections are most adaptable to passenger enplanement projections as well as based and registered aircraft projections. These projections reflect historical trends and therefore may include increasing, constant, or decreasing future market shares. A primary concern regarding market share forecasting revolves around the confidence that is placed in the overall "market" forecast. If the market forecast is accurate, it follows that market shares will tend to be accurate as well. For this study, FAA forecasts were used as the market indicators for U.S. airline passenger enplanements and for active registered aircraft. These forecasts are updated annually and thus maintain relative accuracy.

On lower levels of forecasting, the market share methodology was used as well. In this regard, general aviation aircraft operations were forecast using a market share ratio called Operations-Per-Based-Aircraft (OPBA). In a sense, each based aircraft represented a "share" of the total operations at a particular airport.

2.2 Socioeconomic Regression Projection

The socioeconomic regression projection is based upon an assumed causal relationship between population, income, or employment and aviation activity in a particular area. To obtain this

projection of demand, socioeconomic data are related via regression analysis to aviation activity. The resulting set of regression equations, coupled with independent projections of future socioeconomic data, produces a projection of aviation activity.

Measures of socioeconomic activity in Delaware initially focused on three sets of statistics:

- Population
- Per Capita Personal Income (PCPI)
- Employment

These statistical data were collected during the inventory phase of the study. In particular, the historical portions of the data were collected from the U.S. Department of Commerce, Bureau of Economic Analysis, while the forecast portions (except for PCPI) were collected from the latest Delaware Population Consortium report¹. These projections are officially recognized by the Delaware State Planning Office and the U.S. Department of Housing and Urban Development.

The socioeconomic regression projection technique measures the relationship between the dependent variables (aviation activity) and independent variables (socioeconomic statistics). There is usually an assumption of causality between the independent and dependent variables. A statistic produced by the analysis called the coefficient of determination, R^2 . The R^2 statistic indicates whether the relationship between dependent and independent variables is significant by explaining the percentage variation in the dependent variable associated with the variation in the independent variable. In this study, preference was given to simple linear, ordinary least squares regression. Other more complex forms of regression analysis including multiple independent variable or logarithmic were not employed since data testing did not reveal the need to use these methods. Socioeconomic regression analysis was used to develop projections of demand for registered aircraft. Independent variables that were used in the regression analysis included population, income, and employment, by county.

2.3 Trend Analysis Projection

A projection based upon trend analysis of historical data is one means of forecasting aviation activity. Typically, trend analysis fits historical data to classical growth curves and extends the demand element into future periods. The most common growth curves are in the form of linear, exponential, and logarithmic equations. Most forecasters believe that prior events have an influence on current and future activities. The methods described thus far make little assumption about the **way** in which the past influences the future. In fact, the time series least squares analysis assumes that all past events will influence the future with equal weight. Such an assumption quickly loses credibility in the light of dramatic changes that have occurred in the airline industry since 9/11/01 or the cessation of single engine aircraft production. For this study, then, two trend analysis projection methods were used: exponential smoothing and time series least squares.

¹ Source: Delaware Population Annual Population Projections, October 11, 2005, Version 2005.0

Exponential Smoothing

The exponential smoothing process offers a method of weighting the historical data to avoid a simplified view of each past event. This process is based on a weighted average of past events, constructed with geometrically declining weights. Thus, the original data values are replaced with a smoothed series. The exponential smoothing process can be described mathematically as follows:

$$\bar{x}_t = \alpha x_t + \alpha(1-\alpha)x_{t-1} + (1-\alpha)^2 x_{t-2} + \dots$$

This reduces to:

$$\bar{x}_t = \alpha x_t + (1-\alpha)\bar{x}_{t-1}$$

Hence, the original value for x_t is replaced with a smoothed series \bar{x}_t .

Time Series Least Squares

Another very simple method that was used in the forecasting procedure was the time series least squares analysis. Often, a forecaster can use a time series least squares trend line as a starting point for further analysis. Time series least squares analysis extrapolates historical trends through the forecast period. One shortcoming of this projection technique is that no causal factors are considered, and all historical data points are weighted equally. This method assumes that historical trends will repeat themselves in the future. Another possible shortcoming is that the historical data may not fit a linear trend line.

2.4 Role of Judgmental Forecasting Input

There are a number of methods that have formalized the role of judgmental input to the forecasting or decision making process. The Delphi Method was developed as a means to formalize the input of knowledgeable people for use in predicting certain outcomes or decisions. This is a type of "decision by poll" or decision by consensus that is sometimes desirable for forecasting purposes.

For this study, airport operators were asked about future growth and plans for their airports. In most cases, the responses were used in the judgmental process of evaluating various projections. For example, the desires at Chorman Airport to develop a large number of T-hangars will materially impact the forecasts of aviation demand. Similarly, the lack of growth plans at some other privately owned airports will result in lower estimates of future aviation demand. In addition to these inputs, forecasts from current airport master plans for Summit, New Castle Airport, and Sussex County Airport were used in developing the SASPU forecasts.

2.5 Application of Selected Forecasting Methodology

The forecasting techniques described above are anticipated to be used for each of the aviation activity elements included in this study. This process requires explanation since the forecasting

techniques offer no detailed descriptions of how they will be used on each activity indicator. Described below are the detailed methods of forecasting each element of aviation demand for this system plan.

Airline Passenger Enplanements

Airline passenger enplanements are defined as passengers who have boarded a departing aircraft. Forecasts of enplanements for New Castle Airport were developed using a market share analysis combined with a comparative analysis. The comparative analysis examined other similar sized markets with a nearby hub airport. Because airline service began on June 29, 2006, there is no historical data string that can be used to determine a trend in enplanement growth. Thus, the comparative analysis established a baseline level of enplanements, which were then forecast using a constant market share of U.S. enplanements. This forecast assumed that growth of airline enplanements at New Castle Airport will mirror the national growth rate.

Aircraft Fleet

Forecasts of registered aircraft were performed for each county in Delaware. Because there may be a future registration fee for aircraft registered in Delaware, it was important to project the potential number of registered aircraft throughout the planning period. All three forecasting techniques were used to develop projections of registered aircraft demand. The FAA's national projections of registered aircraft from their Fiscal Years Forecast series was used as the "market" for the county market share forecasts. Both static and dynamic market share projections were developed from the historical data. County socioeconomic data (population, income, employment) were used to generate the socioeconomic regression projections of registered aircraft. Exponential smoothing and least squares trend analysis were used for the trend projections. From these three projection methodologies, a preferred forecast was selected using statistical and judgmental methods.

Historical based aircraft information was collected and market shares of based-to-registered aircraft were derived from the registered aircraft historical data. It was found through this process that very little correlation existed between the growth in registered aircraft and based aircraft growth. This is due to the fact that most of Delaware's registered aircraft are located out-of-state and are simply registered to corporations based in Delaware. Property tax laws favor registrations of this type, and therefore, growth in aircraft registrations has far outstripped the growth in locally based aircraft. Thus, based aircraft forecasts were developed using historical trends from each airport and projecting them into the future.

Aircraft Operations

General aviation operations were forecast using an operations-per-based-aircraft ratio. That is, historical OPBA levels were trended for each airport and applied to forecast based aircraft numbers. In sequence, based aircraft must be forecast before general aviation operations. Because there is no current aircraft operations counting program in place, the operations forecasts at all but

New Castle Airport had to be developed from historical estimates. Air Traffic Control Tower counts were used for New Castle County Airport.

Airline operations forecasts were calculated using the enplanement forecasts, aircraft equipment capacities, and projected load factors. Peak period activity was estimated from the airline schedules and projected operations.

For general aviation peak period operations, the forecasting method used was similar to other peak period estimation techniques. In this regard, historical relationships were identified between peak period operations and annual operations at each airport. If trends were apparent in the historical data, they were projected into future periods. Otherwise, a static ratio was used.

The projections of local/itinerant operational splits were based upon historical information. In this regard, the data was examined for trends and when found, were trended into the future. If no trends were found, a static ratio of local percentage versus itinerant percentage was used.

Military Operations

Annual military operations were forecast using an average of the historical data for each airport. These will be supplemented with discussions with military representatives at Dover AFB and at New Castle County Airport. Adjustments will be made if military personnel indicate changes in anticipated military operations levels at Delaware airports.

General Aviation Passengers Enplanements

General aviation enplanements were forecast as a function of general aviation aircraft average occupancy rates and itinerant and local operations. Thus, this projection technique is not a true share of the market but rather it is based on a relationship between aircraft occupancy and a type of aircraft operation (itinerant or local). In sequence, general aviation enplanements were forecast after general aviation aircraft operations.

Active Pilots

A forecast of active pilots was derived using national, State, and Delaware data concerning pilot licenses. In this regard, a constant share of the market forecast was developed for Delaware pilots.

3. AIRLINE DEMAND FORECASTS

The forecasts of airline demand for Delaware focused on the only airline airport in the State. New Castle Airport has had airline service at various times in the past. Prior to Delta's inauguration of service in the summer of 2006, New Castle Airport was served by Shuttle America in 1999 and 2000. In the absence of airline service within the State, Delawareans must drive to out-of-state airports such as Philadelphia International and BWI. The latest airline service offering in Delaware

is subject to the financial health of the carrier (Delta) and the acceptance of the service by local air travelers.

Airline demand forecasts focused on enplanements as the driving force for all of the other components of airline demand. Thus, if the number of annual and peak hour enplanement forecasts is realistic, all of the other portions of demand should be reasonable, as well. Components of the airline forecast include:

- Airline Passenger Enplanements
 - Total Annual
 - Peak Month, Average Day of Peak Month, Peak Day, Peak Hour
- Airline Aircraft Operations
 - Total Annual
 - Fleet Mix
 - Peak Month, Average Day of Peak Month, Peak Hour
- Air Cargo Activity

3.1 Airline Enplanement Forecast

The forecast of airline enplanements used two different means of projecting airline enplanements to see if consistent trends evolved. Methods used in the forecasting process included:

- Comparative Analysis
- Market Share Projection

Because there is no history associated with the Delta Airlines service at New Castle Airport, there can be no trend analysis or regression analysis, since historical data strings are necessary for those analyses.

Comparative Analysis

A comparative methodology developed for air service studies was employed in this study. The comparative analysis examined historical performance of other airline airports that are similar in size and economic profile to New Castle Airport. Obviously, there are numerous factors that contribute to the success of an airline operation and no two communities are exactly alike. But there is value in looking at the common measures of airline demand, including the number of enplanements-per-capita that occur in different communities and the impact of larger nearby airline airports on demand (such as Philadelphia International's impact on New Castle Airport).

For this study, a model was used that estimates total potential air travel demand from small-to-medium sized cities located near major alternate airports. Because we know that large airports (or airports with low fares) attract a certain percentage of passengers from smaller airports, one way of estimating the effects of this phenomenon is to chart the information from many different airports concerning their number of enplanements, their population, and their distance to the nearest larger

airline airport. A final level of comparison dealt with the types of airline service available and how that, in itself, either limits or enables local enplanement growth. Recent statistical information from 91 communities throughout the U.S. was gathered in developing the model. Information input to the model included: enplanements, county population, distance to the nearest large hub air terminal, and type of airline service available (turbo prop, jet, etc.).

The type of airline service available turns out to be a significant factor in measuring the actual ability of an airport to capture local airline passengers. In this regard, airports with large jet service enplaned more *per capita* than did airports with regional jet service only. Similarly, airports with regional jet service enplaned more per capita than airports with turbo-prop service only. For these reasons, three estimates of local demand were generated: one for the total service area and two for the probable immediate demand that could be captured with 1) good local service using large jet aircraft service and, 2) for regional jet aircraft (50-seat or less) only.

	Annual Enplanements
● New Castle County total passenger potential:	790,600
● Large jet aircraft market capture potential:	290,900
● Regional jet aircraft market capture potential:	87,300

These numbers are based on the *average* performance of other cities across the United States. Actual performance at ILG could be either higher or lower than these averages. In the forecast, these numbers may have to be dampened due to airline capacity constraints. That is, if too few seats are available in the market to meet this potential demand, the actual demand will be lower. For example, if the airline begins service with three flights per day, using 50 seat aircraft, the largest number of enplanements that could be carried in a year would be slightly under 55,000 (at 100 percent load factor).

Currently, there is a significant leakage of all passenger trips generated from New Castle County, Delaware to airline airports outside of the State. This leakage has been estimated at almost 800,000 passenger enplanements per year. While it would not be possible to capture all of these passengers at New Castle Airport due to the presence of Philadelphia International and BWI, the model predicts that 11 percent of these could be retained if regional jet service were available. Delta's initial service to ILG is with regional jets. The model also predicts that if large jet service were offered at ILG, up to 37 percent of the market could be captured.

Market Share Projections

Because airline service was only recently resumed, the market share projection could not use historical enplanement data to determine any trend, whether increasing, decreasing, or static. Therefore, the estimated first year traffic potential was used as the basis for estimating the market share as a percent of U.S. enplanements. Both levels of service were included in the 2005 base data. That is, both the regional jet service and large jet service scenarios were included as projections. That share was held constant throughout the forecast period. To obtain a forecast, the projected constant market share was applied to the Federal Aviation Administration's (FAA) latest forecast

of total U.S. enplanements. Table 3-1 presents the market share projections of airline enplanement demand for New Castle Airport. As shown there are two projections of demand. For this forecast, the Regional Jet Service Projection was shown as preferred, since that is currently being provided by Delta Airlines. This forecast projects 100,600 enplanements by 2010, 116,300 by 2015, and 155,400 by the year 2025.

Table 3-1 - Enplanement Projections					
Year	US Enplanements ¹	ILG Regional Jet Service	Market Share	ILG Large Jet Service	Market Share
2000	704,888,000				
2001	693,179,000				
2002	627,684,000				
2003	643,261,000				
2004	688,313,000				
2005 ²	731,698,000	87,300	0.0119%	290,900	0.0398%
2010	843,236,000	100,600	0.0119%	335,200	0.0398%
2015	974,580,000	116,300	0.0119%	387,500	0.0398%
2020	1,125,984,000	134,300	0.0119%	447,700	0.0398%
2025	1,302,402,000	155,400	0.0119%	517,800	0.0398%

¹ History and forecast from FAA Terminal Area Forecasts: <http://www.apo.data.faa.gov/main/taf.asp>
² Represents potential demand for ILG service.

Although the forecast for ILG show a beginning year total of 87,300, that number represents a mature market. Thus, it is likely that a two-year ramp-up period (2008) will be needed to achieve the 87,300 passenger enplanement level. From there, activity should grow at the national rate.

Airline Aircraft Operations Forecast

A forecast of airline operations is required to assess the adequacy of the terminal and airfield system throughout the planning period and to help determine the financial impact and the environmental effects associated with future air traffic levels.

Table 3-2 presents a projection of airline operations, based on the current schedule and projected level of passengers. The projections relies on a ratio called enplanements-per-departure. The forecast of annual airline operations, each operation consisting of one takeoff or landing, was derived from the forecast of annual enplaned passengers for each respective component of airline demand. The methodology used consisted of the following steps:

- Determine the historical ratio of enplaned passengers to airline departures ((enplanements/operations) times 2);
- Project changes in the enplaned passengers per departure ratio for the planning period for each component of demand;
- Apply the projected enplaned passengers per departure ratios to the forecasts of annual enplaned passengers to calculate airline operations, ((enplanements/enplanements-per-departure) times 2).

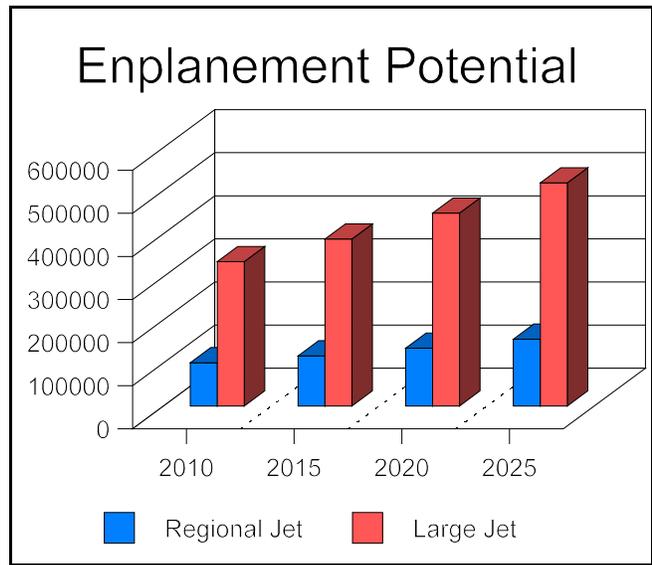


Figure 3-1 - Forecast of Enplanement Potential

The key component of the forecast, therefore, is the projection of a reasonable enplanement-per-departure ratio. During the period (as will be shown in the next section), the average number of seats per departure for the airlines serving New Castle Airport is expected to grow from 34.2 to 37.9. This growth will readily accommodate the expected increase in enplanements-per-departure that are forecast for the airport.

Table 3-2 - Forecast of Airline Operations			
Year	Airline Operations	Enplanements	Enplanements Per Departure Ratio
2008 ¹	4,700	87,300	37.1
2010	4,900	100,600	41.0
2015	5,400	116,300	43.0
2025	6,900	155,400	45.0

¹ It is assumed that it will take 2 years to reach enplanement comparative potential for ILG.

Airline Fleet Mix

Related to the number of airline operations at New Castle Airport is the size and make up of the airline's fleet serving the market. Forecasting the airline fleet mix permits planners to estimate the need for airport facilities in terms of runway length, strength, and terminal building requirements.

In 2006, Delta started its service using 40 passenger CRJ 140. It is anticipated that a small percentage of those aircraft will still be operating in that market by 2008, but many will have been replaced by the 50-seat regional jets. By 2010, the market will have grown to the point where some service from 70-seat regional jet aircraft will be needed. This growth continues throughout the planning period, resulting in a year 2025 split of 70%-30% (50-seat to 70-seat aircraft split). Table 3-3 presents the forecast of airline fleet mix for New Castle Airport.

Table 3-3 - Airline Fleet Mix Forecast				
Year	40-Seat RJ	50-Seat RJ	70-Seat RJ	Total
2008 Operations	520	4,180	0	4,700
%	11.1%	88.9%	0.0%	100.0%
Forecast				
2010 Operations	0	4,165	735	4,900
%	0.0%	85.0%	15.0%	100.0%
2015 Operations	0	4,320	1,080	5,400
%	0.0%	80.0%	20.0%	100.0%
2025 Operations	0	4,830	2,070	6,900
%	0.0%	70.0%	30.0%	100.0%

The forecast trend of average airline airplane size, in terms of the number of seats per departure at New Castle Airport includes the following:

	Aircraft Size Average Seats/Departure
● 2008	48.9
● 2010	53.0
● 2015	54.0
● 2025	56.0

Peak Period Airline Activity

Airline activity is subject to peak period movements. Measures of this activity can include peak month, average day of the peak month, peak day, and peak hour operations and enplanements. These indicators are used by airport planners to estimate airfield layouts and terminal building and parking area size and configurations. Because airline operations are scheduled, it is easier to track peak period activity than similar measures for general aviation activity. Discussed below are the methods used to forecast peak period airline activity, along with the forecasts themselves.

Peak Period Airline Operations

For this study, the Delta Airlines schedule was consulted to determine New Castle Airport’s peak period airline operations. From the schedule it was determined that with only one carrier, and 18 operations per week, there is no peak period. The maximum peak hour operations is 2; the minimum is 1. This trend is likely to continue into the future unless a second air carrier is introduced to the market or an additional hub city is added. Under those circumstances, 4 peak hour operations would be possible. For the forecast then, 2 peak hour airline operations are predicted through the year 2015, with 4 peak hour operations forecast for the last period, year 2025. The monthly and daily peak period forecasts are include in Table 3-4, along with peak hour departures.

Table 3-4 - Airline Peak Hour Operations and Enplanements					
Year	Annual Airline Operations	Peak Month Operations	Ave Day of Peak Month	Peak Hour Operations	Peak Hour Departures
2008	4,700	430	14	2	1
Forecast					
2010	4,900	450	15	2	1
2015	5,400	495	17	2	1
2025	6,900	630	21	4	2

Peak Period Airline Enplanements

Peak period airline enplanements include the peak month, peak day, average day of the peak month, and peak hour enplanements. Estimating the peak hour in a non-survey method is relatively simple using inputs already generated by this forecasting methodology. Normally, peak period departures times the peak number of enplanements-per-departure will yield peak hour enplanements. This procedure was used in estimating peak month enplanement activity. The average day of the peak month was estimated by dividing the peak month by 30. The peak day of the peak month was estimated by increasing the average day by 10 percent.

Peak hour airline enplanements are defined as the peak number of enplanements during any one hour period in a calendar year. For this analysis, the methodology could be simplified to show that the potential peak hour enplanements would total the seating capacity for the largest aircraft to use the airport. In this case, the 70 seat RJ is the largest aircraft and would create the potential peak hour number of enplanements.

Table 3-5 presents the results of the peak period enplanement forecasts for New Castle Airport. For the forecast period, peak hour enplanements are anticipated to grow from 50 in 2008

to 120 by the year 2025.

Table 3-5 - Airline Peak Period Enplanements					
Year	Annual Airline Enplanements	Peak Month Enplanements	Ave Day of Peak Month	Peak Day of Peak Month	Peak Hour Enplanements
2008	87,300	3,201	107	117	50
Forecast					
2010	100,600	3,689	123	135	70
2015	116,300	4,264	142	156	70
2025	155,400	5,698	190	209	120

4. GENERAL AVIATION DEMAND FORECASTS

General aviation is defined as all civil flying except that classified as airline. This includes flying for pleasure, business, or training, in aircraft ranging from single-engine, fixed wing to balloons. In Delaware, the most significant demand for airports, airport facilities, and airport services stems from general aviation. To accurately measure the State's future facility and airway needs, activity in this very important part of aviation must be forecast. General aviation demand can be forecast using different measures of activity. These different elements include:

- Registered Aircraft Forecast
- Based Aircraft Forecast
- Based Aircraft Fleet Mix
- General Aviation Operations
 - Annual Operations - Local/Itinerant Split
 - Peak Month and Peak Hour Operations
 - Operational Fleet Mix Forecast
- Annual General Aviation Enplaned Passengers
- Civil Pilots in Delaware

4.1 Registered Aircraft Forecast

A registered aircraft is defined as being either fixed or rotary wing, operated in non-airline service with a current registration. Historical information used to develop the registered aircraft forecast is based on data compiled by private vendors (Avantext, Hi-Tech Marketing) for the years 1995-2005 and by the FAA published in their **Census of U.S. Civil Aircraft** (1990-1994). These sources provided aircraft information, by type for each Delaware county on an annual basis.

In total, registered aircraft forecasts were developed for the three Delaware counties. It should be noted that the number of registered aircraft in Delaware counties in recent years have increased dramatically as a result of tax-sheltering of assets by corporations based in the State. This is not to say that these aircraft are based in the State - most are not. However, to arrive at an acceptable forecast, three methodologies were used that included share of the market, socioeconomic regression, and trend analysis. Forecast methodologies described in the previous section were employed to obtain reasonable forecasts of registered aircraft. The following sections briefly discuss the parameters of each projection methodology.

Market Share Projection

The historical market share was calculated using the U.S. historical registered aircraft as the base (divisor) and corresponding county registered aircraft as the numerator. Both static and dynamic market shares were evaluated. The static market share was calculated based upon the last year of available data applied to year 2010, 2015, and 2025 registered aircraft forecasts for the U.S. The static market share projection assumed that a county's registered aircraft will increase at the same rate as that of the United States. The dynamic share was estimated using a trend of the

historical market share. Table 3-6 presents the market share projections of registered aircraft demand for each Delaware county.

Socioeconomic Regression Projections

A total of three socioeconomic regression projections were developed for each Delaware county. The socioeconomic regressions used population, employment, and income statistics from each county. The socioeconomic statistics were regressed against registered aircraft and projections were made based upon the resulting regression equations. Table 3-6 presents the socioeconomic regression projections of registered aircraft for Delaware counties. Also presented are the regression R² values for each projection.

Trend Projections

Trend projections use historical registered aircraft data to formulate predictions of future activity. For this study, two trend analysis methods were used to project registered aircraft activity - double exponential smoothing and least squares linear trending. As described earlier, the double exponential smoothing process produces projections by combining the forecast for the previous period with an adjustment for past errors. Double exponential smoothing is appropriate when the time series contains a linear trend. Table 3-6 presents both trend projections of registered aircraft in Delaware.

Table 3-6 - Forecast of Registered Aircraft by County					
YEAR	2005	2010	2015	2025	R squared (Theils U)
KENT COUNTY					
Market Share					
1. Constant	1,391	1,517	1,608	1,794	
2. Dynamic	1,391	1,405	1,337	1,148	
Socio-Regression					
3. Population	1,391	2,042	2,349	2,901	0.75
4. Employment	1,391	1,856	1,937	2,088	0.82
5. PCPI	1,391	1,930	2,240	2,861	0.78
Trend Analysis					
6. Exp. Smoothing	1,391	1,348	1,287	1,163	(0.93)
7. Linear Trend	1,391	2,002	2,354	3,057	0.87
Derived Projections					
8. High/Low Average	1,391	1,695	1,821	2,103	
9. Multi-Average	1,391	1,729	1,873	2,145	
SELECTED	1,391	1,517	1,608	1,794	

Table 3-6 - Forecast of Registered Aircraft by County					
YEAR	2005	2010	2015	2025	R squared (Theils U)
NEW CASTLE COUNTY					
Market Share					
1. Constant	10,103	11,018	11,682	13,029	
2. Dynamic	10,103	11,702	13,647	17,988	
Socio-Regression					
3. Population	10,103	12,598	14,711	18,083	0.98
4. Employment	10,103	10,069	10,450	10,564	0.90
5. PCPI	10,103	14,052	17,334	23,897	0.78
Trend Analysis					
6. Exp. Smoothing	10,103	12,422	14,606	18,973	(0.70)
7. Linear Trend	10,103	13,643	16,701	22,817	0.98
Derived Projections					
8. High/Low Average	10,103	12,061	13,892	17,230	
9. Multi-Average	10,103	12,215	14,161	17,907	
SELECTED	10,103	11,018	11,682	13,029	
SUSSEX COUNTY					
Market Share					
1. Constant	385	420	445	496	
2. Dynamic	385	468	546	692	
Socio-Regression					
3. Population	385	420	468	551	0.95
4. Employment	385	417	451	507	0.96
5. PCPI	385	454	527	672	0.94
Trend Analysis					
6. Exp. Smoothing	385	464	542	697	(0.75)
7. Linear Trend	385	433	493	612	0.97
Derived Projections					
8. High/Low Average	385	443	496	597	
9. Multi-Average	385	439	496	604	
SELECTED	385	439	496	604	

Selection of Preferred Forecast

As noted earlier, much of the registered aircraft growth in Delaware since the early 1990s is directly attributable to the tax laws in the State that do not tax aircraft as personal property. Many of the registered aircraft are not based in the State, but only registered to a corporation that is incorporated in Delaware. Because this explains most of the high growth in New Castle and Kent Counties, forecasting judgment must be used in selecting a preferred forecast of registered aircraft.

This historical data shows that the most recent years have slowed or reversed the growth trend created by the tax shelter incentives. In this regard, much of the historical data is skewed since it reflects growth that has either matured or slowed. Thus, to select high growth scenarios would be to ignore the most recent trends. For this reason, conservative forecasts, based on the Constant Market Share of national growth were selected for both Kent and New Castle counties. Those projections imply that growth in Delaware will at least match the national trend. For Sussex County, a higher growth was selected, since its historical numbers do not reflect the corporate tax shelter trends of the other two counties. In this regard, an average of all of the projections (Multi-Average) was selected, reflecting a consensus of all high and low projections. The Multi-Average Projection has the benefit of reducing the influence of a single high or low projection if the majority of other projections were in the other direction. As shown in Table 3-6, Sussex County projected the highest percentage growth over the forecast period (57 percent), followed by both Kent and New Castle County (29 percent). These growth rates are significantly lower than previous system planning forecasts and represent a maturing market in Delaware.

4.2 Based Aircraft Forecast

By definition, a based aircraft is a general aviation aircraft which is stationed at an airport on a permanent basis. Unlike registered aircraft forecasts, which draw from an array of published historical data sources, based aircraft forecasts are hindered by the lack of reliable historical data. For this study, historical based aircraft information was taken from the FAA's Form 5010-1, supplemented by input from airport master plans, the FAA's Terminal Area Forecasts, and airport manager reviews.

Two projections of based aircraft were developed: a historical trend approach that considered past growth at a particular airport, and a market share approach that considered the growth rate in registered aircraft for each Delaware county. From these two approaches, a forecast of based aircraft was developed for each Delaware airport.

Table 3-7 presents the forecasts of based aircraft for all public-use airports in Delaware. In addition to the forecasts made for individual airports, based aircraft totals for the State are presented in Table 3-7. As shown, the numbers of based aircraft in the State are forecast to increase from 506 in the first period to 692 by the year 2025 - a 37 percent growth over the period. This growth is slightly higher than the national average of 29 percent growth of active aircraft over the same period.

Table 3-7 - Forecast of Based Aircraft				
AIRPORT	2005	2010	2015	2025
Chandelle Estates	24	25	26	28
Chorman Airport	19	25	35	49
Civil Air Terminal	0	0	0	0
Delaware Airpark	44	48	51	57
Jenkins Airport	19	21	22	25
Laurel Airport	14	16	18	22
New Castle Airport	257	280	297	331
Smyrna Airport	6	7	7	8
Summit Airport	76	83	88	98
Sussex County Airport	47	54	61	74
Delaware Total	506	559	605	692

4.3 Based Aircraft Fleet Mix Forecast

An aircraft fleet mix refers to the characteristics of a population of aircraft. General aviation aircraft are classified with regard to specific physical traits such as aircraft type (whether fixed wing or rotorcraft), their weight, and number and type of engines. Aircraft having dissimilar physical and operating traits require varying types and amounts of airport facilities. For this reason, it is important to estimate the type of aircraft that will be operating and based at Delaware airports.

In the forecasting process, the based aircraft fleet mix is used later to determine operational fleet mix forecasts. Fleet mix categories included: single engine, multi-engine, turbojet, rotorcraft, and "other." This information was available from the most recent FAA Form 5010-1, Airport Master Record.

The fleet mix forecasting process involved a number of steps:

- The existing based aircraft fleet mix at each public-use airport was identified.
- Growth rates for each aircraft type from the forecast of general aviation fleet mix for the United States (Table III.4) were calculated.
- U.S. fleet mix growth rates were applied to the based aircraft forecasts for each planning period.

Using this method, the based aircraft fleet can be projected using national trends of active aircraft fleet mix. Table III.5 presents a summary of the forecast of based aircraft fleet mix for each public use airport in Delaware.

Table 3-8 - U.S. Fleet Mix Forecast¹							
Year	Single Engine	Multi-Engine	Turboprop	Jet	Rotor	Other ²	Total
2005	144,530	17,481	8,030	8,628	7,595	28,327	214,591
2010	147,150	17,575	9,030	11,757	9,915	38,785	234,212
2015	149,075	17,660	10,030	15,605	11,945	43,805	248,120
2025	153,097	17,829	12,030	23,031	16,078	56,165	278,231

¹ Source: FAA Aviation Forecasts for Fiscal Years 2006-2017 with year 2025 extrapolated by Consultant.
² Includes experimental aircraft, sport aircraft, ultralights, balloons, and gliders.

Table 3-9 - Forecast of Based Aircraft Fleet Mix by Airport						
Airport	Single-Engine	Multi-Engine	Jet	Rotor	Other	Total
Chandelle Estates						
2005	22	2	0	0	0	24
2010	23	2	0	0	0	25
2015	24	2	0	0	0	26
2025	26	2	0	0	0	28
Chorman Airport						
2005	17	2	0	0	0	19
2010	21	2	0	0	2	25
2015	26	3	1	0	5	35
2025	35	4	2	0	8	49
Delaware Airpark						
2005	42	2	0	0	0	44
2010	44	3	0	0	1	48
2015	45	3	1	0	2	51
2025	45	4	3	1	4	57
Jenkins Airport						
2005	18	1	0	0	0	19
2010	21	0	0	0	0	21
2015	22	0	0	0	0	22
2025	25	0	0	0	0	25
Laurel Airport						
2005	13	1	0	0	0	14
2010	15	1	0	0	0	16
2015	16	1	0	0	1	18
2025	18	1	0	0	3	22
New Castle Airport						

Table 3-9 - Forecast of Based Aircraft Fleet Mix by Airport						
Airport	Single-Engine	Multi-Engine	Jet	Rotor	Other	Total
2005	167	24	66	0	0	257
2010	183	26	70	1	0	280
2015	191	28	74	2	2	297
2025	211	31	81	4	4	331
Smyrna Airport						
2005	6	0	0	0	0	6
2010	7	0	0	0	0	7
2015	7	0	0	0	0	7
2025	8	0	0	0	0	8
Summit Airport						
2005	63	6	0	7	0	76
2010	68	7	1	7	0	83
2015	68	8	5	7	0	88
2025	75	9	7	7	0	98
Sussex County Airport						
2005	35	5	4	2	1	47
2010	40	5	5	2	2	54
2015	43	6	7	2	3	61
2025	49	7	12	2	4	74
DELAWARE TOTALS						
2005	383	43	70	9	1	506
2010	422	46	76	10	5	559
2015	442	51	88	11	13	605
2025	492	58	105	14	23	692

4.4 General Aviation Operations Forecast

As mentioned previously, an operation is either a takeoff or a landing. Thus, a takeoff and landing constitute two operations. General aviation operations forecasts were prepared for each public-use airport in Delaware for a number of activity measures. In this regard, the following operational elements were forecast:

- Annual Operations - Local/Itinerant Split
- Peak Period Operations
- Operational Fleet Mix

Descriptions of the methodologies and results for each of these elements are presented below.

Annual Operations Forecast - Local/Itinerant Split

Forecasts of general aviation operations were developed using a two-step process. First, historical operations-per-based-aircraft (OPBA) ratios for each airport were estimated. The OPBA's are ratios of total general aviation operations at an airport divided by the corresponding number of based aircraft. These OPBA's were further subdivided into local and itinerant OPBA ratios. Table 3-10 presents the forecast of local and itinerant general aviation operations for each Delaware public-use airport.

Except for Chorman Airport, the ratio between local and itinerant operations was held constant in forecast years. At Chorman Airport, the development of new hangars is expected to draw a significant number of based aircraft in the future. This based aircraft population is anticipated to change the local-itinerant split toward more local operations. That trend is reflected in the projected numbers. In addition, the forecasts show that there are no local operations at the Civil Air Terminal due to the prohibition of civil aircraft training at Dover AFB. Table 3-10 presents the forecast of general aviation operations at Delaware public-use airports. As shown, aircraft operations are anticipated to grow from 303,800 in 2005 to 425,800 by the year 2025 - a 40 percent increase.

Table 3-10 - Forecast of General Aviation Operations

AIRPORT	2005			2010			2015			2025		
	Local	Itinerant	Total									
Chandelle Estates	6,500	300	6,800	6,800	300	7,100	7,000	300	7,300	7,600	400	8,000
Chorman Airport	1,500	13,100	14,600	4,200	15,000	19,200	9,900	17,000	26,900	18,900	19,500	38,400
Civil Air Terminal	0	660	660	0	800	800	0	1,000	1,000	0	1,400	1,400
Delaware Airpark	30,000	6,000	36,000	32,700	6,500	39,200	34,700	6,900	41,600	38,700	7,700	46,400
Jenkins Airport	1,000	1,500	2,500	1,000	1,500	2,500	1,200	1,700	2,900	1,300	1,900	3,200
Laurel Airport	7,000	750	7,750	8,000	900	8,900	9,000	1,000	10,000	11,000	1,200	12,200
New Castle Airport	70,247	53,253	123,500	76,600	58,100	134,700	81,200	61,600	142,800	90,600	68,700	159,300
Smyrna Airport	2,000	300	2,300	2,000	300	2,300	2,300	300	2,600	2,600	400	3,000
Summit Airport	39,800	25,500	65,300	41,500	26,600	68,100	46,000	29,500	75,500	51,300	32,900	84,200
Sussex County	28,800	15,600	44,400	32,900	17,800	50,700	37,100	20,100	57,200	45,200	24,500	69,700
Delaware Total	186,847	116,963	303,810	205,700	127,800	333,500	228,400	139,400	367,800	267,200	158,600	425,800

Peak Period Operations

Since many general aviation landside and airfield facility needs are related to the levels of activity during peak periods, forecasts were developed for peak month, design day, and design hour general aviation operations at Delaware public-use airports. Typically, non-towered general aviation airports do not keep accurate records of peak period activity. Thus, an industry-accepted method of estimation was used to predict peak period activity that does not require a census of hourly operations totals. The approach used in developing the peak period operations forecasts is outlined as follows:

- **Peak Month GA Operations:** This level of activity is defined as the calendar month when peak aircraft operations occur. Peak Month percentages at Delaware Airports were estimated using the assumption that peak month operations are 10 percent greater than average month operations. The only exception to this rule was for New Castle Airport, where actual FAA Air Traffic Control Tower statistics were used to establish general aviation peak month operations.
- **Design Day Operations:** This level of operations is defined as the average day within the peak month. This indicator can be readily developed by dividing peak month operations by 30.
- **Peak Hour Operations:** This level of operations is defined as the peak hour within the design day. For airports with between 50 and 300 design day operations, general aviation peak hour operations tend to be 20 percent of those design day operations. As the design day operations decrease, the peak hour percentage increases and vice versa.²

Table 3-11 presents the forecast of peaking characteristics for general aviation operations at Delaware public-use airports. As shown, general aviation peak hour operations are forecast to range from 2 to 84 by the year 2025. It should be noted that forecast airline and military peak hour operations will be added to the general aviation segment to develop a total forecast peak hour operations potential for applicable airports.

Table 3-11 - Forecast of Peak Period Operations				
AIRPORT	GA Operations	Peak Month	Design Day	Peak Hour
Chandelle Estates				
2005	6,800	623	21	6
2010	7,100	651	22	7
2015	7,300	669	22	7
2025	8,000	733	24	7
Chorman Airport				

²

Source: New York State Department of Transportation, Aviation Bureau research. Lorrin Bird, 2001.

Table 3-11 - Forecast of Peak Period Operations				
AIRPORT	GA Operations	Peak Month	Design Day	Peak Hour
2005	14,600	1,338	45	13
2010	19,200	1,760	59	14
2015	26,900	2,466	82	16
2025	38,400	3,520	117	23
Civil Air Terminal				
2005	660	348	87	26
2010	800	422	105	32
2015	1,000	527	132	40
2025	1,400	738	185	56
Delaware Airpark				
2005	36,000	3,300	110	22
2010	39,200	3,593	120	24
2015	41,600	3,813	127	25
2025	46,400	4,253	142	28
Jenkins Airport				
2005	2,500	229	8	2
2010	2,500	229	8	2
2015	2,900	266	9	3
2025	3,200	293	10	3
Laurel Airport				
2005	7,750	710	24	7
2010	8,900	816	27	8
2015	10,000	917	31	9
2025	12,200	1,118	37	11
New Castle Airport				
2005	123,500	12,271	409	70
2010	134,700	13,384	446	76
2015	142,800	14,188	473	80
2025	159,300	15,828	528	84
Smyrna Airport				
2005	2,300	211	7	2
2010	2,300	211	7	2
2015	2,600	238	8	2
2025	3,000	275	9	3
Summit Airport				
2005	65,300	5,986	200	40

Table 3-11 - Forecast of Peak Period Operations				
AIRPORT	GA Operations	Peak Month	Design Day	Peak Hour
2010	68,100	6,243	208	42
2015	75,500	6,921	231	46
2025	84,200	7,718	257	51
Sussex County Airport				
2005	44,400	4,070	136	27
2010	50,700	4,648	155	31
2015	57,200	5,243	175	35
2025	69,700	6,389	213	43

Peak month operations at New Castle Airport averaged 9.94 percent from 2001 through 2005

Operational Fleet Mix Forecast

The operational fleet mix forecast was derived directly from based aircraft fleet mix unless other specific information concerning operational use was available. The process involved multiplying the operations per based aircraft (OPBA) utilization rate times the number of aircraft in each category. Table 3-12 presents the forecast of operational fleet mix for each public-use airport in Delaware.

Table 3-12 - Forecast of Operational Fleet Mix						
AIRPORT	Single-Engine	Multi-Engine	Jet	Rotor	Other	Total
Chandelle Estates						
2005	6,233	567	0	0	0	6,800
2010	6,532	568	0	0	0	7,100
2015	6,738	562	0	0	0	7,300
2025	7,429	571	0	0	0	8,000
Chorman Airport						
2005	13,063	1,537	0	0	0	14,600
2010	16,128	1,536	0	0	1,536	19,200
2015	19,983	2,306	769	0	3,843	26,900
2025	27,429	3,135	1,567	0	6,269	38,400
Civil Air Terminal						
2005	0	218	343	99	0	660
2010	0	264	416	120	0	800
2015	0	330	520	150	0	1,000
2025	0	462	728	210	0	1,400
Delaware Airpark						
2005	34,364	1,636	0	0	0	36,000

Table 3-12 - Forecast of Operational Fleet Mix						
AIRPORT	Single-Engine	Multi-Engine	Jet	Rotor	Other	Total
2010	35,933	2,450	0	0	817	39,200
2015	36,706	2,447	816	0	1,631	41,600
2025	36,632	3,256	2,442	814	3,256	46,400
Jenkins Airport						
2005	2,368	132	0	0	0	2,500
2010	2,500	0	0	0	0	2,500
2015	2,900	0	0	0	0	2,900
2025	3,200	0	0	0	0	3,200
Laurel Airport						
2005	7,196	554	0	0	0	7,750
2010	8,344	556	0	0	0	8,900
2015	8,889	556	0	0	556	10,000
2025	9,982	555	0	0	1,664	12,200
New Castle Airport						
2005	80,251	11,533	31,716	0	0	123,500
2010	84,115	11,951	32,175	460	0	128,700
2015	91,834	13,463	35,580	962	962	142,800
2025	101,548	14,919	38,983	1,925	1,925	159,300
Smyrna Airport						
2005	2,300	0	0	0	0	2,300
2010	2,300	0	0	0	0	2,300
2015	2,600	0	0	0	0	2,600
2025	3,000	0	0	0	0	3,000
Summit Airport						
2005	54,130	5,155	0	6,014	0	65,300
2010	55,793	5,743	820	5,743	0	68,100
2015	58,341	6,864	4,290	6,006	0	75,500
2025	64,439	7,733	6,014	6,014	0	84,200
Sussex County Airport						
2005	33,064	4,723	3,779	1,889	945	44,400
2010	37,556	4,694	4,694	1,878	1,878	50,700
2015	40,321	5,626	6,564	1,875	2,813	57,200
2025	46,153	6,593	11,303	1,884	3,768	69,700
DELAWARE TOTALS						
2005	232,970	26,055	35,838	8,003	945	303,810
2010	249,200	27,763	38,106	8,201	4,230	327,500

Table 3-12 - Forecast of Operational Fleet Mix						
AIRPORT	Single-Engine	Multi-Engine	Jet	Rotor	Other	Total
2015	268,313	32,152	48,538	8,993	9,805	367,800
2025	299,810	37,224	61,037	10,847	16,882	425,800

4.5 Annual General Aviation Enplaned Passengers

Forecasts of annual general aviation enplaned passengers play an important role in determining such landside facilities as the general aviation terminal building sizes and the amount of automobile parking areas and access roads. This activity indicator is often ignored due to the lack of historical data.

To forecast general aviation enplaned passengers, an aircraft occupancy rate was multiplied by the number of departures from an airport. In 2003, the Aircraft Owners and Pilots Association (AOPA) estimated that an average of 2.5 passengers per general aviation departure was a reasonable estimate of aircraft occupancy. For this study, this factor was applied to all forecast itinerant departures and 10 percent of local departures except for the Civil Air Terminal (to account for touch-and-go training that does not add to landside facility use) in order to tabulate a forecast of general aviation enplanements. The Civil Air Terminal at Dover Air Force Base has a much higher enplanement per departure number due to its use by NASCAR race teams. For this facility, the average number of passengers per departure used in the forecast was 15. These tabulations are presented in Table 3-13.

Table 3-13 - Forecast of General Aviation Enplanements				
AIRPORT	2005	2010	2015	2025
Chandelle Estates	1,200	1,200	1,300	1,500
Chorman Airport	16,600	19,300	22,500	26,700
Civil Air Terminal	4,900	6,000	7,500	10,500
Delaware Airpark	11,300	12,200	13,000	14,500
Jenkins Airport	2,000	2,000	2,300	2,500
Laurel Airport	9,700	11,100	12,500	15,300
New Castle Airport	75,300	82,200	87,200	97,200
Smyrna Airport	600	600	700	800
Summit Airport	36,900	38,400	42,600	47,500
Sussex County Airport	23,100	26,400	29,800	36,300
Delaware Total	181,600	199,400	219,400	252,800

It can be argued that this methodology ignores 90 percent of the local operations component, which is true. However, local operations are primarily training and are typically made up of repeated takeoffs and landings. Pilots in training do not add significantly to the passenger through-put of the

airport facilities and thus their total inclusion would unduly raise the projected demand levels, which in turn, would suggest unnecessary facilities. Thus, this component is cut by 90 percent to increase the reasonability of the projections.

4.6 Civil Pilots in Delaware

One gauge of future aviation demand in Delaware is the number of pilots anticipated over the long term. In this regard, a forecast of pilots was prepared for the short, intermediate, and long term periods. The forecast was prepared using a top-down, share of the market approach. In this regard, total pilots for Delaware were forecast as a subset of the national forecasts of active pilots. To forecast the number of civil pilots in Delaware, a short history was examined (Table 3-14) and compared to corresponding totals for the U.S. An average market share of 2.25 percent of the history was used to project future growth in pilots in Delaware. As shown, Delaware's pilot population has hovered around 1,400 since 2001. For the future, the forecast shows increases from 1,382 in 2005 to 1,663 by the year 2025 - a 20.3 percent increase over the period.

Table 3-14 - Forecast of Delaware Pilots			
Year	U.S. Civil Pilots	DE Pilots	DE Market Share
2002	631,762	1,398	2.21%
2003	625,011	1,402	2.24%
2004	618,633	1,404	2.27%
2005	609,603	1,382	2.27%
Forecast			
2010	623,962	1,403	2.25%
2015	665,932	1,497	2.25%
2025	739,846	1,663	2.25%

5. MILITARY OPERATIONS FORECAST

Military activity shows little or no correlation to community socioeconomic data or other recognized air traffic indicators. The level of military operations is a function of Department of Defense Policy and Congressional funding. Therefore, it is difficult to accurately predict the level of activity for Delaware airports. Table 3-15 presents the existing and forecast military activity for each Delaware public-use airport (including Dover Air Force Base) with some record of previous military use. To develop a forecast, the most recent historical level of activity was simply held constant throughout the planning period. In addition to the annual operations forecast, a projection of peak hour operations was included in Table 3-15.

Table 3-15 - Forecast of Military Operations at Delaware Airports				
	2005	2010	2015	2025
Dover AFB	124,000	124,000	124,000	124,000
Peak Hour	66	66	66	66
New Castle Airport	10,612	10,600	10,600	10,600
Peak Hour	10	10	10	10
Summit Airport	100	100	100	100
Peak Hour	2	2	2	2
Sussex County Airport	1,200	1,200	1,200	1,200
Peak Hour	4	4	4	4

6. SUMMARY OF AVIATION DEMAND FORECASTS

Table 3-16 presents a summary of the aviation demand forecasts for each system airport. Included in summary are airport-specific based aircraft and operations numbers, along with enplanement and peak period statistics. It should be noted that peak hour components were added to project the highest potential peak period operations for each airport. While rare, all of the types of activity could potentially occur during the same hour.

Table 3-16 - Summary of Aviation Demand Forecasts				
Airport/Forecast Component	2005	2010	2015	2025
Chandelle Estates				
Based Aircraft	24	25	26	28
Operations	6,800	7,100	7,300	8,000
Peak Hour Operations	6	7	7	7
Enplanements - GA	1,200	1,200	1,300	1,500
Chorman Airport				
Based Aircraft	19	25	35	49
Operations	14,600	19,200	26,900	38,400
Peak Hour Operations	13	14	16	23
Enplanements - GA	16,600	19,300	22,500	26,700
Civil Air Terminal¹				
Based Aircraft	0	0	0	0
Operations	660	800	1,000	1,400
Peak Hour Operations	26	32	40	56
Enplanements - GA	4,900	6,000	7,500	10,500
Delaware Airpark				
Based Aircraft	44	48	51	57
Operations	36,000	39,200	41,600	46,400

Table 3-16 - Summary of Aviation Demand Forecasts				
Airport/Forecast Component	2005	2010	2015	2025
Peak Hour Operations	22	24	25	28
Enplanements - GA	11,300	12,200	13,000	14,500
Jenkins Airport				
Based Aircraft	19	21	22	25
Operations	2,500	2,500	2,900	3,200
Peak Hour Operations	2	2	3	3
Enplanements - GA	2,000	2,000	2,300	2,500
Laurel Airport				
Based Aircraft	14	16	18	22
Operations	7,750	8,900	10,000	12,200
Peak Hour Operations	7	8	9	11
Enplanements - GA	9,700	11,100	12,500	15,300
New Castle Airport				
Based Aircraft	257	280	297	331
Operations - Total	134,112	150,200	158,800	176,800
Airline	NA	4,900	5,400	6,900
General Aviation	123,500	134,700	142,800	159,300
Military	10,612	10,600	10,600	10,600
Peak Hour Operations - Total	82	88	92	96
Airline	2	2	2	2
General Aviation	70	76	80	84
Military	10	10	10	10
Enplanements - Airline	87,300	100,600	116,300	155,400
Enplanements - GA	75,300	82,200	87,200	97,200
Smyrna Airport				
Based Aircraft	6	7	7	8
Operations	2,300	2,300	2,600	3,000
Peak Hour Operations	2	2	2	3
Enplanements - GA	600	600	700	800
Summit Airport				
Based Aircraft	76	83	88	98
Operations	65,400	68,200	75,600	84,300
General Aviation	65,300	68,100	75,500	84,200
Military	100	100	100	100
Peak Hour Operations	42	44	48	53
General Aviation	40	42	46	51

Table 3-16 - Summary of Aviation Demand Forecasts				
Airport/Forecast Component	2005	2010	2015	2025
Military	2	2	2	2
Enplanements - GA	36,900	38,400	42,600	47,500
Sussex County Airport				
Based Aircraft	47	54	61	74
Operations	45,600	51,900	58,400	70,900
General Aviation	44,400	50,700	57,200	69,700
Military	1,200	1,200	1,200	1,200
Peak Hour Operations	31	35	39	47
General Aviation	27	31	35	43
Military	4	4	4	4
Enplanements - GA	23,100	26,400	29,800	36,300
Delaware Total				
Based Aircraft	506	559	605	692
Operations - Total	315,722	350,300	385,100	444,600
Airline	NA	4,900	5,400	6,900
General Aviation	303,810	333,500	367,800	425,800
Military¹	11,912	11,900	11,900	11,900
Peak Hour Operations - Total	233	256	281	327
Enplanements - Airline	87,300	100,600	116,300	155,400
Enplanements - General Aviation	181,600	199,400	219,400	252,800

¹ Does not include Dover AFB military operations.

Chapter 4: Demand/Capacity & System Needs

Demand/Capacity & Aviation System Needs

THE PURPOSE OF THIS CHAPTER IS TO compare forecast aviation demand with existing airport capacities and then to identify potential bottlenecks and needed facilities. One of the ultimate outputs of the system plan is to determine the locations and types of airport facilities needed to adequately serve the State of Delaware. Areas where capacity deficiencies are expected can be given special attention in the identification of appropriate alternatives that will deal with the specific problems. This chapter is divided into three major sections:

- Demand/Capacity Analysis
- Facility Needs Analysis
- Summary

1. DEMAND/CAPACITY ANALYSIS

Using existing airport master plans, the prior aviation system plan, and Federal Aviation Administration (FAA) Advisory Circular 150/5060-5 **Airport Capacity and Delay**, airport airfield capacities for public-use system airports were determined. Also, many of the previous system planning capacity calculations have been updated for each individual airport. This section briefly outlines the process by which airfield capacity was obtained or calculated and presents the results of the analysis. The discussion is organized as follows:

- Definition of Airfield Capacity
- Methodology Used
- Hourly Capacity and Annual Service Volume
- Annual Aircraft Delay

The analysis of landside capacity was included in the Facility Needs Analysis since the determination of landside capacity often was the very measure of facilities needed (auto parking spaces, hangar facilities, terminal building, etc.).

1.1 Definition of Airfield Capacity

Airfield capacity, as it applies to the Delaware Aviation System Plan Update is a measure of terminal area airspace and airfield saturation. It is defined as the maximum rate at which aircraft can arrive and depart an airfield with an acceptable level of delay. Measures of capacity in this chapter include the following:

- **Hourly Capacity of Runways:** The maximum number of aircraft operations that can take place on an airport runway system in one hour.
- **Annual Service Volume:** The annual capacity or a maximum level of annual aircraft operations that can be accommodated on an airport runway system with an acceptable level of delay.
- **Annual Delay:** The total amount of time per year that aircraft are delayed due to a

constrained operating environment at an airport.

1.2 Methodology Used

A variety of techniques have been developed for the analysis of airfield capacity. The current technique accepted by the Federal Aviation Administration and employed in this study is described in the FAA Advisory Circular 150/5060-5, **Airport Capacity and Delay**. The Airport Capacity and Delay Model (ACDM) from that Advisory Circular uses the following inputs to derive an estimated airport capacity:

- Meteorological Conditions
- Airfield Layout and Runway Use
- Navigational Aids
- Aircraft Operational Fleet Mix
- Touch-and-Go Operations

These inputs were used in the calculation of airfield capacity at public-use airports in Delaware.

Meteorological Conditions

Wind conditions are of prime importance in determining runway use and orientation. The most desirable runway orientation based on wind is the one which has the largest wind coverage and minimum crosswind components. Wind coverage is that percentage of time crosswind components are below an acceptable velocity. In this regard, the FAA recommends that a runway system provide 95 percent wind coverage.

In addition to wind coverage, meteorological conditions involve visibility and cloud ceiling conditions. Visual Meteorological Conditions (VMC) are those weather conditions that permit aircraft to operate and maintain safe separations by visual means (generally a minimum of a 1,000 foot cloud ceiling with 3 miles horizontal visibility). Aircraft that operate under these conditions generally use Visual Flight Rules (VFR). Instrument Meteorological Conditions (IMC) exist when the height of the dominant cloud base falls below that prescribed under VMC, and the range of horizontal visibility is constrained below VMC limits. During these weather conditions, aircraft must operate under Instrument Flight Rules (IFR). Other factors not associated with weather can also influence the use of VFR and IFR operations such as airline operations and instrument flight training.

Airfield Layout and Runway Use

A portion of the capacity analysis is related to the airfield layout and runway use. For single runway airports, the location of the taxiways, combined with the mix of aircraft using the airport determines the average amount of runway occupancy time for arriving aircraft. For multiple runway airports such as New Castle Airport capacity of the runway system is impacted by the simultaneous use of more than one runway. In addition, the layout of the runway system (intersecting versus

parallel) determines the efficiency by which simultaneous operations can be managed. Operating configurations that converge have lower hourly capacities than parallel configurations. Also, it should be noted that for capacity calculation purposes, multiple runway airports are treated as single runway airports if there is no Air Traffic Control Tower (ATCT) available at the facility.

Navigational Aids

The availability of navigational aids permits airports to remain open for greater portions of the year than non-instrument capable airports. For example, airports without navigational aids cannot be used during Instrument Flight Rule (IFR) conditions. Thus, airports that do not have IFR capacity will have a lower overall capacity than airports with such capability. The influence of Air Traffic Control facilities available at an airport is also important. If an Approach Control facility with radar can directly vector an aircraft to a position from which an instrument landing can occur, the separation between arriving aircraft can be shortened. This separation must necessarily increase for safety purposes if no radar or Approach Control facility is available. Thus, the capacity of an instrument-equipped airport will differ, based upon the complexity of facilities available.

Aircraft Operational Fleet Mix

The FAA's Airport Capacity and Delay Model identifies an airport's aircraft fleet mix in terms of four classifications ranging from A (small, single engine with gross weight 12,500 lbs. or less) to D (large aircraft with gross weights over 300,000 lbs.). These classifications and examples of each are identified in Table 4-1.

The capacity model requires that total annual operations be converted to operations by specific aircraft classification category. In particular, the "C" plus "D" percentage (if greater than zero) significantly impacts the capacity calculation. This is important since aircraft of different sizes and speeds must be spaced farther apart in approach and departure sequencing than aircraft of similar size and speed. Also, the existence and frequency of wake vortices require greater separations when light aircraft follow heavy aircraft than vice versa.

Table 4-1 - Aircraft Classification System Used In Capacity Model			
CLASS A	Small single-engine, gross weight 12,500 pounds or less		
	Examples:	Cessna 172/182 Beech Bonanza	Cirrus SR20/22 Piper Cherokee/Warrior
CLASS B	Twin-engine, gross weight 12,500 pounds or less		
	Examples:	Beech Baron Cessna 402 Mitsubishi Mu-2	Piper Navajo Beech 99 Rockwell Turbo Commander
	CLASS C	Large aircraft, gross weight 12,500 pounds to 300,000 pounds	
Examples	Boeing 737/757 Lear 35/55	Gulfstream G-II/III/IV/V Airbus 319/320/321	

Table 4-1 - Aircraft Classification System Used In Capacity Model			
		McDonnell Douglas MD 80/88	Challenger 600/601
CLASS D	Large aircraft, gross weight more than 300,000 pounds		
	Examples	Boeing 747/767/777	Airbus A-300/310/380
		Lockheed L-1011	

Touch-And-Go Operations

A touch-and-go operation occurs when an aircraft lands and then makes an immediate takeoff without coming to a full stop. Touch-and-go operations increase the number of operations that a runway system can process due to the low occupancy time associated with each operation. The primary purpose of touch-and-go operations is for the training of student pilots. In Delaware, Chandelle Estates and Jenkins Airport are two privately owned airports that do not permit touch-and-go operations.

* * * * *

Table 4-2 presents a listing of the airfield capacity inputs for each of the public-use airports in Delaware. As shown, the multiple runway airports (Jenkins, New Castle Airport, Summit, and Sussex County Airport), have greater wind coverages than the single-runway airports. In addition, the airport fleet mix percentages for "C" and "D" type aircraft are listed.

Table 4-2 - Airfield Capacity Inputs				
Airports By County	Wind Coverage	Touch-And-Go %	Class C&D Aircraft %	IFR Capability
KENT				
Chandelle Estates	91.6%	0%	0%	No
Delaware Airpark	95.4%	40%	0%	Yes
Chorman Airport	95.7%	10%	0%	No
Jenkins Airport	98.6%	0%	0%	No
Smyrna Airport	91.8%	30%	0%	No
NEW CASTLE				
New Castle Airport	99.5%	20%	26%	Yes
Summit Airport	95.9%	20%	0%	Yes
SUSSEX				
Laurel Airport	93.6%	30%	0%	Yes
Sussex County Airport	99.1%	30%	9%	Yes

1.3 Hourly Capacity and Annual Service Volume

For each system airport, the FAA's Airport Capacity and Delay Model combined information concerning runway configuration, runway usage, meteorology, operational fleet mix, and touch-and-go operations to produce an hourly capacity base for each VFR and IFR operational runway use configuration. Each hourly capacity base was then assigned a proportionate weight (based on the time each is used) in order to determine the weighted hourly capacity of the entire airfield. Once the weighted hourly capacity was determined for an airport, its annual capacity could then be determined.

The Annual Service Volume (ASV) is a function of the weighted hourly capacity of the airfield and the annual, daily, and hourly demands placed upon the airfield. ASV is estimated by multiplying the daily and hourly operation ratios by the weighted hourly capacity. If the airport's average month, design day and design hour operations are particularly low, this results in significantly lower daily and hourly operations ratios, and consequently, a very low ASV. If operational ratios are high, a high ASV will occur. Table 4-3 presents a summary of the weighted hourly and ASV capacities of the Delaware system airports.

Table 4-3 - Weighted Hourly and ASV Capacities				
County/Airport	Annual Service Volume	Hourly Capacity		
		IFR	VFR	Weighted
KENT				
Chandelle Estates	46,200	0	54	40.8
Delaware Airpark	173,800	20	128	106.2
Chorman Airport	50,500	0	58	45
Jenkins Airport	41,900	0	67	67
Laurel Airport	37,900	20	80	68.9
Smyrna Airport	46,000	0	80	80
NEW CASTLE				
New Castle Airport	190,000	70	104	84.3
Summit Airport	150,200	20	108	92
SUSSEX				
Sussex County Airport	143,200	20	102	87.7

Table 4-4 presents a summary of airfield demand/capacity comparisons for each system airport. For planning purposes, those airports that have reached 75 percent (or more) of their operational airfield capacity are of special concern, since at this level, capacity expansion actions must be considered. In Delaware, a comparison of existing capacity with year 2025 projected operations demand indicates that New Castle Airport would reach 84 percent of airfield capacity. Because of the significance of New Castle Airport to the State aviation system, planning for capacity expansion should be in place during the third phase period (years 2016-2025).

Table 4-4 - Airfield Demand/Capacity Comparisons				
County/Airport	Annual Service Volume	Year 2025 Operations	Percent of Capacity	Annual Delay (Hours)
KENT				
Chandelle Estates	46,200	8,000	17%	9
Delaware Airpark	173,800	46,400	27%	131
Chorman Airport	50,500	38,400	76%	665
Jenkins Airport	41,900	3,200	8%	0
Laurel Airport	37,900	12,200	32%	47
Smyrna Airport	46,000	3,000	7%	0
NEW CASTLE				
New Castle Airport	190,000	159,300	84%	3,823
Summit Airport	150,200	84,200	56%	730
SUSSEX				
Sussex County Airport	143,200	69,700	49%	453
STATE TOTAL	879,700	424,400	48%	5,858

As shown in Table 4-4, airports where airfield capacity will become a concern by 2025 include New Castle and Chorman. On a statewide basis, 48 percent of the airfield capacity available at the State's public use airports will be used by the year 2025. When New Castle Airport is taken out of the State totals, it can be shown that the remaining public use airports will have roughly 70 percent of their airfield capacity available by the year 2025.

1.4 Annual Aircraft Delay

Annual aircraft delay is an important measure of how well the airfield services demand. It can also be used to estimate economic costs of experiencing delay and thus provide a feasibility measure for airport improvement projects. Delay statistics can be expressed either in total number of annual hours or as an average in minutes per aircraft operation. FAA Advisory Circular 150/5060-5, **Airport Capacity and Delay**, provides a graph of the relationship between the Demand-ASV ratio and average aircraft delay (in minutes per operation). The relationship can be expressed as follows in Table 4-5.

Table 4-5 - Demand/Capacity and Average Delay	
Ratio of Annual Demand to ASV	Average Annual Aircraft Delay (Minutes per Operation)
0.1	0.0
0.2	0.1
0.3	0.2
0.4	0.3
0.5	0.4
0.6	0.6
0.7	0.8
0.8	1.2
0.9	1.8
1.0	2.8
1.1	5.6
1.2	10.0
1.3	15.0

As shown, when annual aircraft operations equal annual service volume (ratio of 1.0), the average annual aircraft delay is 2.8 minutes per aircraft. The actual level of delay can vary dramatically and is dependent upon a number of conditions including weather, air traffic control, runway down times for maintenance, etc. For example, a 4 minute average delay can be associated with actual delay periods of 20 minutes or longer.

Average annual delay estimates for each of the Delaware Aviation System Airports were presented earlier in Table 4-4. If no capacity expansion is undertaken for the future, the aviation system is anticipated to experience almost 5,900 hours of aircraft operational delay by the year 2025. Over 65 percent of this delay will be attributable to one airport: New Castle Airport (over 3,800 hours of delay). Summit Airport and Chorman Airport will experience the next highest amounts of delay (730 annual hours and 665 annual hours respectively), while aircraft operational delays at the remaining public-use airports will be negligible. Thus, capacity enhancements there, and at Chorman Airport and Summit Airport to a lesser degree, would accommodate all significant aircraft delays anticipated at Delaware airports over the planning period.

On a State-wide basis, the sum of all airport capacities is enough to handle all future traffic in the area. This assumes that if one airport becomes saturated in terms of aircraft operations, the excess demand would be distributed to nearby airports with surplus capacity. The combined airfield capacities of all system airports is about 880,000 operations per year. The total number of operations projected for the year 2025 is roughly 424,400 or about 48 percent of total capacity.

2. AVIATION SYSTEM NEEDS

ONE OF THE ULTIMATE OUTPUTS OF THE system plan is to determine the locations and types of airport facilities needed to adequately serve the State of Delaware. The purpose of generating airport facility needs is to identify potential "trouble spots" at existing system airports in terms of capacity deficiencies or airport improvement needs. This section builds on the results of the Demand/Capacity Analysis in Section 1 and will ultimately provide a base upon which the analysis of alternatives can be performed. In order to adequately address aviation system requirements this chapter has been organized to include the following sections:

- Airport Systems Concept
- Airport Facility Need Standards
- Airfield Facility Needs
- Landside Facility Needs
- Airspace/Navaid Needs
- Surface Transportation Needs
- Summary of Findings

2.1 Airport Systems Concept

An airport "system" implies a group of interdependent airports regularly interacting toward a unified goal. Each airport in a system, therefore, has a specific function which contributes toward that goal. The Aviation System Needs portion of the analysis applies system parameters to the network of Delaware public-use airports in order to better define the needs of airport users and citizens of the State. In this regard, the goals and objectives of the study provide direction as to what is ultimately desirable in the State's air transportation system. To better define the location and types of facilities needed, the following criteria were developed:

- ***Demand/Capacity Relationships:*** Where capacity deficits appear (either for the airfield or for the landside), additional airport facilities are needed. Facility requirements in this chapter deal only with existing airports and use FAA and aviation industry standards.
- ***Airport Locational Criteria:*** These standards are based upon the stated goals and objectives of the study. As such, the following locational standards apply:
 - Commercial air service should be within 60 minutes driving time for all of the State's citizens.
 - Business jet airports (ARC: C-II or Larger) should be within 30 minutes driving time of all significant population centers of more than 25,000.
 - Utility airports (ARC: B-I and B-II) should be within 30 minutes driving time of all cities with over 2,500 population.
- ***Airport Master Planning Recommendations:*** All recent master plans were examined to determine their site-specific facility recommendations for Delaware airports. Airport master plans often have examined local issues in far greater detail than is possible in a study of this scope. Thus, the facility recommendations from

airport master plan studies will be examined for use in this system plan.

Using these three input factors, a general idea of the location and types of airports needed in Delaware can be generated.

Airport Demand/Capacity Relationships

From the Demand/Capacity Analysis section, it was evident that capacity limitations will begin to create excessive delays at New Castle Airport during the long-range planning period. In addition, Chorman, Summit, and Sussex airports will reach between 49 to 76 percent of their capacity by the end of the planning period. All of the other public use airports will be well under their estimated airfield and landside capacity.

Thus, airfield capacity needs will probably spur the development of capacity relief facilities at New Castle Airport toward the end of the planning period (2025). Chorman Airport will also need capacity relief if forecasts of activity are realized. Other airports will not need new facilities from a capacity relief standpoint, but this does not preclude the development of runway and taxiway facilities to accommodate larger or heavier aircraft. For example, some airports may need additional runway length, based upon the type of aircraft forecast to use the facility. In these cases, the airport will have sufficient capacity to accommodate the number of operations forecast, but may not have the length, width, or strength to adequately serve forecast demand.

From the landside perspective, many aircraft owners desire hangar facilities due to inclement weather or excessive sun exposure in Delaware. As the cost of aircraft continues to rise, the relative value of each plane appreciates. Thus, hangars are used both for convenience and to protect valuable investments. Presently, many system airports have waiting lists for hangar space. These examples point to a need for continuous upgrading of facilities. Airfield and landside improvements at system airports are discussed later in this chapter under the topic of airport facility needs standards.

Airport Locational Criteria

Airport locational criteria were developed in response to the goals and objectives of the study pertaining to air transportation accessibility. These goals and objectives translated the need for commercial service and general aviation airport availability into driving times from population centers. Figure 4-1 presents a graphic depiction of 30 minute driving times around B-I or larger airports. For commercial service airports (New Castle, Philadelphia International, BWI, and Salisbury, MD), Figure 4-2 presents a depiction of 60 minute driving times around each facility, as they impact Delaware.

As shown on the maps, there are several areas that are beyond the 30 minute driving time radii of B-I or larger airports in Delaware. However, no incorporated cities with more than 2,500 population are outside the 30 minute driving time areas. Even so, it can be argued that the Bethany Beach area down to Fenwick Island is a significant population center that is "unserved" by a

Delaware general aviation airport, since it is over 30 minutes driving time to the Sussex County Airport. This is true, but these areas are served by Ocean City Airport, located roughly 10 miles south of the Delaware border.

The significant population centers of Wilmington, Newark, and Dover are all within 30 minutes driving time of C-II or larger airports. New Castle has commercial air service while Dover AFB qualifies as a transport airport since it can safely accommodate corporate jets and is classified as a E-VI airport. As long as Dover AFB accepts civilian aircraft operations, no new C-II facilities are needed in Delaware according to service area criteria. It should be noted that both Summit Airport and Sussex County Airport are classified as B-II and B-III facilities respectively and both currently accommodate business jet activity.

For commercial air service, New Castle Airport provides airline access to northern Delaware residents extending below the city of Dover. From the south, Salisbury, Maryland provides airline service to residents in Sussex County and southern Kent County within an hour's driving time. As shown in Figure 4-2, the State has adequate coverage with regard to airline service availability.

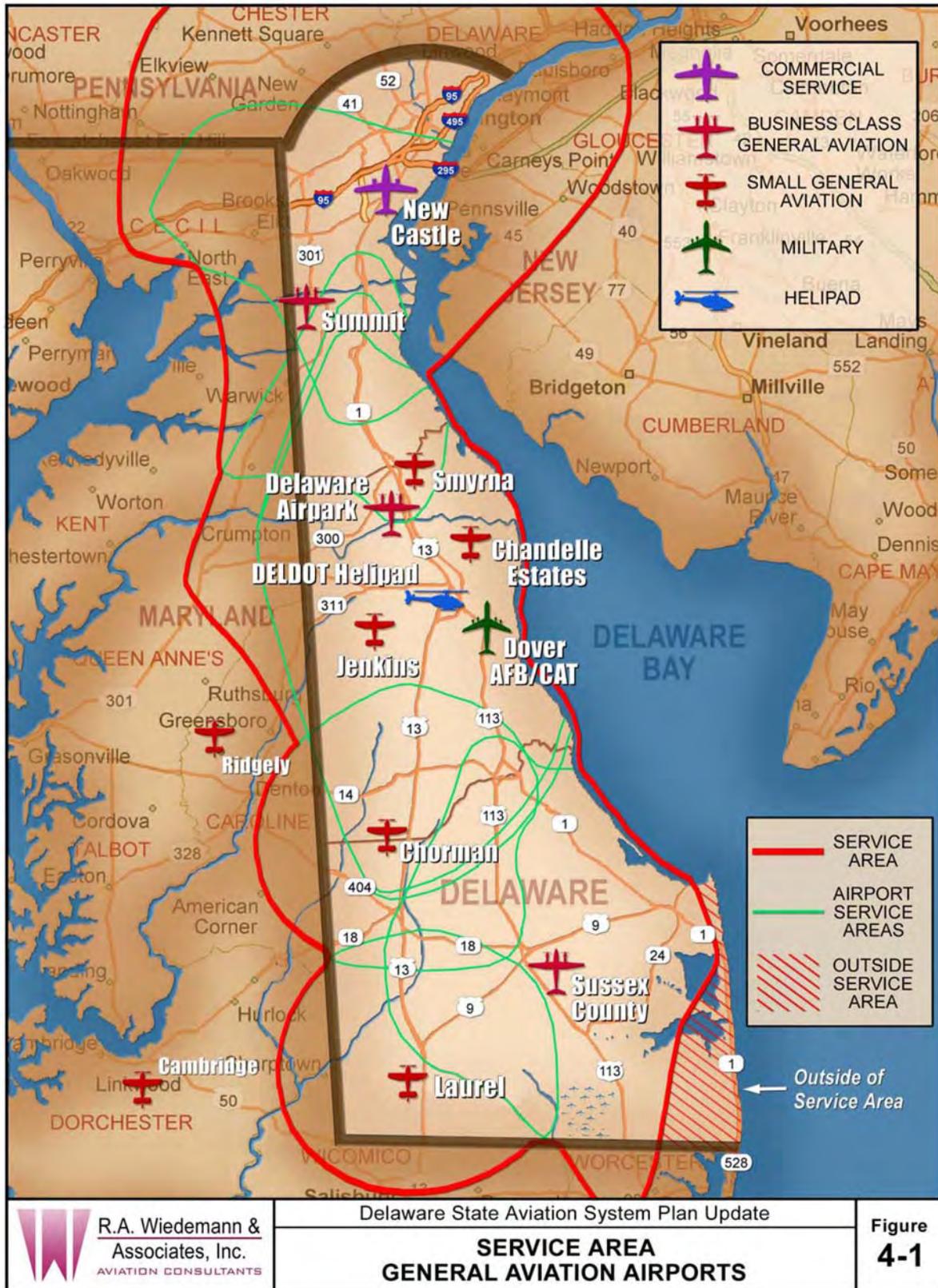
Airport Master Planning Recommendations

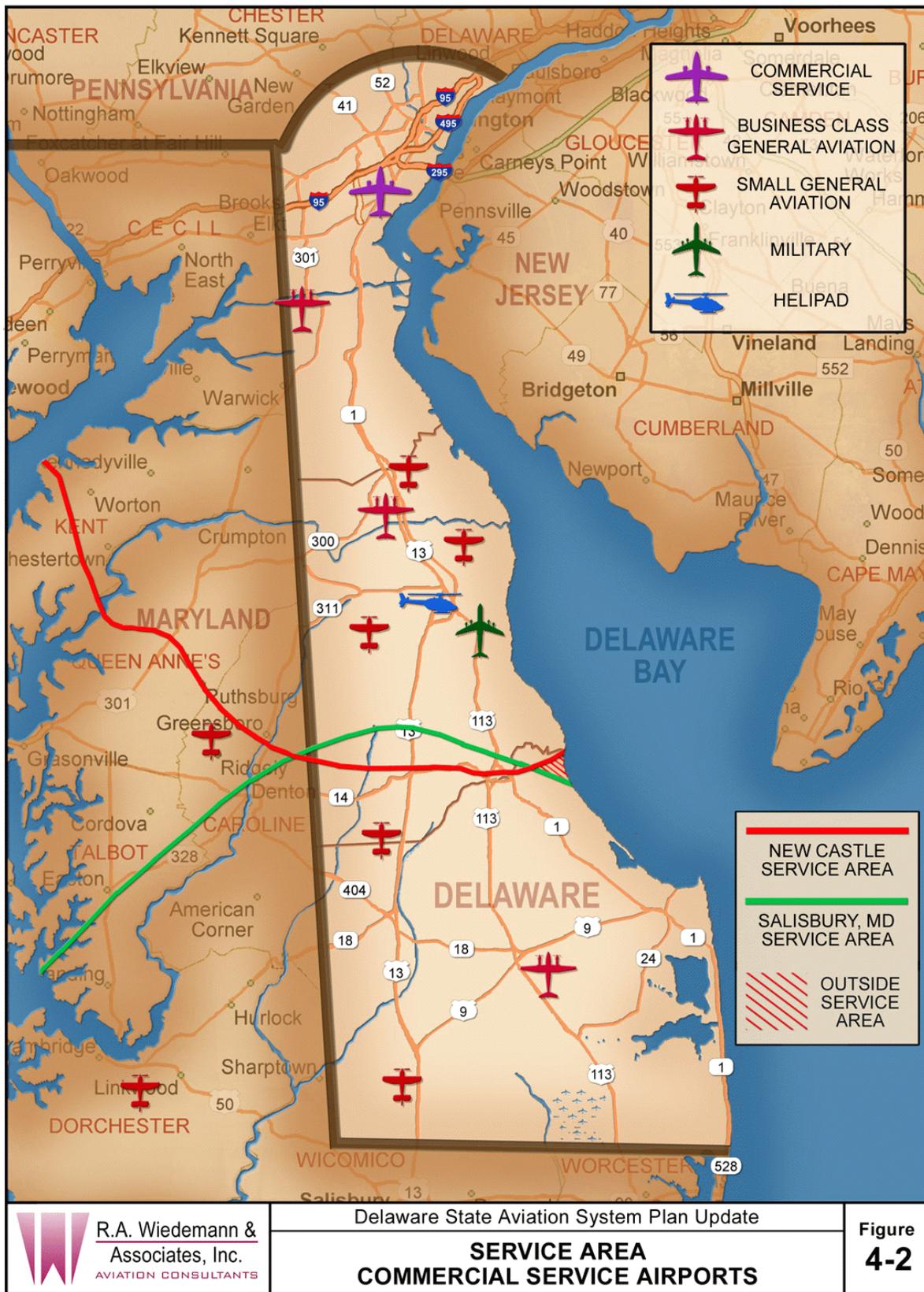
Recommendations from recent airport master plans were used for 4 of the 10 public use airports and were carried through this analysis:

- Delaware Airpark
- New Castle Airport
- Summit Airport
- Sussex County Airport

Since the master planning level of detail exceeds that for system planning, facility recommendations from these plans were used to complement the airport facility requirements standards used in this study. Recommended airfield facility improvements resulting from the application of master planning studies included the following:

- **Delaware Airpark:** The current master plan recommends the lengthening of the runway from 3,582' x 60' to 4,200' x 75' and extending the parallel runway 618' in length and 15' in width. Other findings indicated a need to develop apron, hangars, and terminal area facilities.
- **New Castle Airport:** Runway safety areas and other landside facilities are recommended for improvement as a result of the ongoing New Castle Airport Master Plan.
- **Summit Airport:** Recommendations included the expansion of Runway 17-35 to 5,320 feet with a full parallel taxiway. Findings also indicated the need for the establishment of terminal area facilities for growth and replacement to eventually result in two activity centers that segregate the FBO aircraft maintenance and general aviation services.





- **Sussex County Airport:** Recommendations include the extension of Runway 4-22 from 5,000 feet to 6000 feet. In addition, a new parallel taxiway is recommended for Runway 4-22. Plans are in effect to reopen Runway 10-28, rehabilitated to a length of approximately 3,500' and 75' wide. Runway 13-31 is to be closed.

2.2 Airport Facility Need Standards

From the criteria applied in the previous section, the airport locations and types needed in Delaware become more well defined. This section sets forth the facility need standards that will be used on an individual airport basis throughout the remainder of this study. Facility need standards refer to acceptable planning guidelines issued by the State, FAA, or other recognized industry authorities. These guidelines deal with airport improvements and are linked to increased aviation activity as it affects the role and service level of an airport. The general planning standards used in developing facility recommendations in this study are geared toward airports with paved runways. Development standards used in this analysis include the following improvement categories:

- Land
- Runways and Taxiways
- Aircraft Parking Aprons
- Lighting Systems and Approach Aids
- Hangars
- Auto Parking
- Miscellaneous

Land

Airside land requirements include acreage under runway protection zones, the primary runway surface, and the land under transitional slopes extending from the runway centerline out to the building restriction lines. The dimensional standards for airside land requirements can be derived from the most recent FAA Advisory Circular 150-5300-13 **Airport Design**. These dimensional criteria were followed as closely as possible in determining minimum land requirements for small general aviation airports and were extrapolated for larger airports. Privately owned airports where no airport upgrades were recommended were not subject to these standards.

Landside areas comprise the land required for fixed base operations, aircraft parking aprons, hangar areas, terminal buildings, auto parking lots, access roads, and utilities. Landside areas are dependent upon runway and taxiway configurations, as well as the airport's ground access system. Since landside acreage requirements will vary according to the airport's configuration and ground access system, minimum acreage will differ among the airports. In general, the minimum land area required by each classification is as follows:

Minimum Acreage

- | | |
|-----------------|----------|
| ● A-I | Variable |
| ● B-I | 57 |
| ● B-II | 111 |
| ● C-II & Larger | 214 |

Runways and Taxiways

Runway and taxiway dimensional requirements are outlined in FAA Advisory Circular: 150/5300-13, **Airport Design**. Planning guidelines for runway and taxiway development are dependent upon the largest aircraft to regularly use the airport. Typical runway lengths for system airports in Delaware would include:

- **A-I Runways:** These have a length of approximately 2,500 feet or longer, and a minimum width of 60 feet. Turf runways are not subject to these standards.
- **B-I Runways:** These have a length of about 3,000 feet or longer and a minimum width of 60 feet.
- **B-II Runways:** These have a length of about 3,600 feet or longer and a minimum width of 75 feet. B-II airports that accommodate small planes with 10 or more seats can have a runway length of up to 4,200' and runway strengths up to 30,000 pounds.
- **C-II or Larger Runways:** These have a minimum length of 5,300 feet and a width of 100 feet. These runways accommodate aircraft weighing more than 12,500 pounds.

The requirements outlined the FAA Advisory Circular do not deal with turf airports. Runways at turf airports are generally limited by property boundaries and topography. Property boundary limitations frequently prevent adequate runway protection zones needed to meet minimum federal safety standards.

Aircraft Parking Aprons

Aircraft parking area requirements were calculated on the assumption that paved apron areas will be provided for all based general aviation aircraft not kept in hangars at B-I or larger airports. This was equivalent to 25 percent of all small single engine aircraft based at these airports. A total of 300-400 square yards of apron per aircraft was used for planning the local apron requirement. In addition, transient aircraft parking area requirements equaled one-half the number of busy day (a busy day is 10 percent busier than the average day) transient aircraft, at 400-600 square yards per aircraft. It should be noted that master planning requirements may differ from these system planning standards. In these instances, the master planning recommendations were adopted.

Lighting Systems and Approach Aids

Criteria for airport lighting systems and approach aids were developed for the system plan using FAA standards as a basis. Based on these criteria, high intensity runway lighting (HIRL) and medium intensity approach light systems (MALS) were recommended at airports that qualify for a precision instrument approach. All other runways were recommended to have medium intensity runway lighting (MIRL) systems. The taxiway lighting for all taxiways and turnarounds adjoining a lighted runway was medium intensity taxiway lighting (MITL). For turf airports, low intensity runway lights (LIRL) are considered sufficient. Approach aids were recommended at B-I or larger airports as follows:

- A Non-Precision Instrument Approach Aid was recommended at all C-II and larger airports and other airports with over 20,000 annual operations. In addition, a Global Positioning System (GPS) non-precision instrument approach was recommended for public-use airports with qualifying airfield facilities (proper separation standards for runways and taxiways, lighted obstructions, etc.).
- The GPS-based Wide Area Augmentation System (WAAS), Vertical Navigation (VNAV), or LPV¹ approaches were recommended at airports with qualifying forecasts of operations or instrument approaches or where safety concerns or training activity levels dictated a need.
- A Medium intensity Approach Light System (MALS) was recommended at airports that qualify for precision instrument approaches.
- Runway End Identifier Lights (REIL) were recommended for all paved and lighted runways except those with MALS, since they are not compatible.
- Visual approach aids such as Precision Approach Path Indicators (PAPI) or Visual Approach Slope Indicators (VASI) were recommended for all B-I or larger airport runways not already equipped.

Buildings

Hangar space requirements at system airports were based upon industry standards and experience with aircraft owner preferences in Delaware. These take into account the relative value of each type of aircraft and thus, the relative importance of protecting that investment. Year 2025 hangar space requirements were calculated for each airport as follows:

Percent of Aircraft Type	Type of Storage
100% of Jet Aircraft	Conventional Hangar
50% of Multi Engine Aircraft	Conventional Hangar
50% of Multi Engine Aircraft	T-Hangar
75% of Single Engine Aircraft	T-Hangar
25% of Single Engine Aircraft	Apron Tie-Down

Auto Parking

Auto parking areas are recommended for all classifications of airports. Auto parking space requirements are a function of the number of passengers, employees, and pilots expected to use an airport during the daily peak hour. At general aviation airports, planning standards indicate that

¹ LPV is not an acronym. The name LPV is used for approaches constructed with WAAS criteria where the value for the vertical alarm limit is more than 12 meters and less than 50 meters.

roughly 1.3 auto parking spaces per total number of peak hour general aviation pilots and passengers is adequate.

Miscellaneous

All public use airports capable of night operations were recommended to have both a rotating beacon and a lighted wind indicator. Table 4-6 presents a summary of facility need standards used for the general aviation airports in the Delaware system.

Table 4-6 - General Aviation Minimum Facility Needs Standards			
FACILITIES	B-I Airports¹	B-II Airports¹	C-II & Larger Airports¹
Land			
Airfield	33 Acres	59 Acres	131 Acres
Runway Protection Zones	16 Acres	28 Acres	59 Acres
Landside	8 Acres	24 Acres	24 Acres
TOTALS	57 Acres	111 Acres	214 Acres
Runways			
Length	3,000 Feet ²	3,600 Feet ³	5,300 Feet
Width	60 Feet ²	75 Feet	100/150 Feet
Strength	12,500 Lbs.	12,500 Lbs. ³	Over 12,500 Lbs.
Taxiways			
Parallel (Width)	25 Feet	35 Feet	35/50/75 Feet
Turn-around (Area)	1,400 s.y.	3,000 s.y.	4,000 s.y.
Aircraft Parking Apron			
Based Aircraft (Area)	300 s.y.	300 s.y.	400 s.y.
Itinerant Tiedown (Area)	400 s.y.	400 s.y.	600 s.y.
Lighting and Approach Aids			
HIRL	No	w/Precision Instrument Approach	w/Precision Instrument Approach
MIRL	Yes	Yes	Yes
MITL	Yes	Yes	Yes
LIRL	Less-than-utility Airport Only		
ILS/GPS ⁴	No	Conditional	Conditional
NPIA	Demand Driven	Demand Driven	Yes
Visual Approach Aids	Yes	Yes	Yes
MALS	No	w/Precision Approach	w/Precision Approach
REIL	Yes	Yes (not w/MALS)	Yes (not w/MALS)
Buildings			
GA Terminal (Minimum) ⁵	500 s.f.	800 s.f.	1,000 s.f.
Conventional Hangar	As Required	As Required	As Required

Table 4-6 - General Aviation Minimum Facility Needs Standards			
FACILITIES	B-I Airports ¹	B-II Airports ¹	C-II & Larger Airports ¹
T-Hangar ⁶	As Required	As Required	As Required
Auto Parking			
Area per Space	35 s.y.	35 s.y.	35 s.y.
Miscellaneous			
Fencing	As Required	As Required	As Required
Rotating Beacon	Yes	Yes	Yes
Wind Indicator	Yes	Yes	Yes
Pavement Overlay ⁷	As Required	As Required	As Required

Legend

- HIRL: High Intensity Runway Lights
- MIRL: Medium Intensity Runway Lights
- MITL: Medium Intensity Taxiway Lights
- LIRL: Low Intensity Runway Lights
- GPS: Global Positioning System Approach
- ILS: Instrument Landing System
- NPIA: Non-Precision Instrument Approach
- MALS: Medium Intensity Approach Light System
- REIL: Runway End Identifier Lights

- ¹ U.S. Department of Transportation, Federal Aviation Administration, **Airport Design**, AC No. 150/5300-13, September, 2004.
- ² A-I runways have a length of approximately 2,500 feet or longer, and a minimum width of 60 feet. Turf runways are not subject to these standards.
- ³ B-II airports that accommodate small planes with 10 or more seats can have a runway length of up to 4,200' and runway strengths up to 30,000 pounds.
- ⁴ FAA Order 7031.2C, November 1984, **Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services**, FAA Order 8260.3B, United State Standard for Terminal Instrument Procedures (TERPS), May, 2002, and State discretion.
- ⁵ Delaware recommended standard.
- ⁶ Hangar space dictated by fleet mix: Jets - 100% stored in conventional hangars; Multi Engine - 50% stored in conventional hangars, 50% stored in T-hangars; Single Engine - 75% stored in T-hangars.
- ⁷ Maximum pavement life assumed to be 20 years.

2.3 Airfield Facility Needs

Having stated the dimensional requirements of the airfield facilities, the next step was to apply these standards to the airports in Delaware. The runway extensions indicated by the master plan input, the locational standards, or the fleet mix forecast are included as "needed" facilities. **It should be understood that the designation of an upgrade or improvement for an airport indicates a future aviation need for the general area and does not represent a decision to upgrade that particular airport.** Such a decision must be made by the airport Sponsor, using the results of master planning and appropriate environmental studies as a basis. Table 4-7 presents the airfield improvements suggested by the analysis. All other system airports are assumed to retain

existing runway dimensions for the future planning horizon.

Table 4-7 - Suggested Airfield Improvements to System Airports: Year 2025			
Airport Name	Existing Primary Runway Dimensions	Future Primary Runway Dimensions	Dimensional Upgrade
Chandelle Estates	2,533' x 28'	2,533' x 60'	32' in width
Delaware Airpark ¹	3,582' x 60'	4,200' x 75'	618' in length and 15' in width
Dover AFB ²	12,902' x 150'	N/A	N/A
Chorman Airport	3,588' x 40'	3,600' x 60'	12' in length 20' in width
Jenkins Airport	2,842' x 70'	2,842' x 70'	None
Laurel Airport	3,190' x 270'	3,190' x 270'	None
New Castle Airport	7,012' x 150'	7,012' x 150'	None
Smyrna Airport	2,600' x 125'	2,600' x 125'	None
Summit Airport ¹	4,487' x 65'	5,320' x 75'	833' in length and 10' in width
Sussex County Airport ¹	5,000' x 150'	6,000' x 150'	1,000' in length

¹ Recommendations from airport master plan.

² Recommendations for military runway lengths are made solely by the military.

2.4 Landside Facility Needs

The landside facility needs for Delaware airports were developed on a generalized basis using the demand/capacity relationships developed earlier in this Chapter. For the purposes of this analysis, landside facility requirements refer to the aircraft or passenger processing capability of an airport. As such, landside facility needs were identified for the hangar and apron areas of the general aviation areas of all airports. It should be remembered that facility needs outlined in this section are simply suggestions and cannot be implemented at any of the system airports without airport owner/sponsor support (particularly the privately owned airports). Table 4-8 presents a summary of additional terminal, hangar, or apron facility needs.

In addition, it should be noted that this analysis is meant to identify potential capacity constraints within the system regarding landside passenger handling and aircraft processing capability. That is why the focus of the analysis is on terminal, hangar, and apron area facilities. Later in the Alternatives Analysis (Chapter 6), the entire range of airport facilities including land acquisition, pavement overlays, airfield lighting, and miscellaneous items will be undertaken using the facility requirements standards outlined in this chapter.

Table 4-8 - Suggested Additional Landside Facility Needs (Year 2025)				
Airport Name	Terminal Building Improvements	Additional Apron Area (s.y.)	Additional C- Hangar Space (s.f.)	Additional T- hangar Units
Chandelle Estates	None	1,300 s.y.	None	5 Units
Delaware Airpark	None	None	None	16 Units
Dover AFB/Civil Air Terminal	None	None	N/A	N/A
Chorman Airport	500 s.f.	6,000 s.y.	None	30 Units
Jenkins Airport	500 s.f.	None	None	3 Units
Laurel Airport	None	None	None	None
New Castle Airport ¹	30,000 s.f.	5,300 s.y.	None	79 Units
Smyrna Airport	None	None	None	1 Unit
Summit Airport	None	None	30,600 s.f.	16 Units
Sussex County Airport	None	None	None	28 Units
TOTAL ADDITIONAL FACILITIES	31,000 s.f.	12,600 s.y.	30,600 s.f.	178 Units

¹ The terminal building improvement assumes successful airline service and the need for a new terminal.

2.5 Airspace/Navaid Needs

The inventory chapter defined existing airspace use patterns for both IFR and VFR conditions at Delaware airports. The purpose of this section is to examine the future airspace use patterns for each airport and to identify areas where future IFR demands will require improved navaid facilities. As mentioned in the inventory, the airspace within Delaware is composed of Classes A, B, D, E, and G. Although there is no *special use* airspace in Delaware, it should be noted that there is extensive military training activity using Lockheed Galaxy C5's and other large military transport aircraft at Dover AFB. The airspace and nav aids within the study area have been previously illustrated in Figures 2-2 through 2-6.

From a VFR perspective, no changes, with the exception of increased activity levels, are expected across the State. Even though overlaps will continue in Kent County, no problems are foreseen with respect to VFR activity levels during the planning period. From an IFR perspective, it should be noted that the FAA has primary responsibility for the development and management of the airways system. Thus, it is beyond the scope of this study to detail requirements pertaining to Air Traffic Control facilities or equipment. Rather, the focus of this analysis is directed toward specific airport instrumentation that can serve to increase the level of safety at system airports.

The facility needs portion of this analysis specified recommendations for the provision of nonprecision and precision instrument approaches at system airports. In this regard, it was recommended that a nonprecision Global Positioning System (GPS) instrument approach be available at public use airports in Delaware that had qualifying facilities (proper separation standards for runways and taxiways, lighted obstructions, etc.) Currently, six airports (New Castle County, Summit Airport, Sussex County Airport, Delaware Airpark, Laurel Airport, and Dover AFB) are

already equipped with a minimum of one or more nonprecision instrument approaches. Of these airports, New Castle Airport and Dover AFB have precision instrument approaches. Sussex County Airport is working to upgrade their nonprecision approach to a precision approach in the near future.

Of the remaining airports, Chorman would have the activity needed to justify an instrument approach in the future. However, current runway safety areas would not permit an instrument approach due to the lack of separation between the runway and the various hangar facilities along the flight line. Thus, Chorman would only be eligible if either the runway were relocated or the terminal buildings were relocated. At some point in the future, it is anticipated that the GPS system (WAAS, LPV, VNAV) will permit the addition of precision instrument approach at Summit Airport.

2.6 Surface Transportation Needs

Surface transportation, in this section, is defined as the on-airport capacity of the highway access system. The on-airport surface access systems were examined at each Delaware system airport. From a demand/capacity standpoint, there are no anticipated shortfalls or constraints. If improvements are undertaken, they will probably be for improved convenience or operational efficiency rather than for capacity reasons. Off-airport surface access capacity needs are beyond the scope of this plan. However, a general statement can be made that, given the anticipated surface access demand to each Delaware airport, no significant inefficiencies in the off-airport highway access system were noted. In effect, each airport and its constituent market area is well served by the existing highway system.

On-airport or at-airport access in the state features highways of varying capacities and demand loadings. Future peak hour vehicle traffic generated from airport operations are shown in Table 4-9. In addition, the existing minimum hourly capacities are compared with the future traffic levels. As shown, there is a surplus of not less than 67 percent of the demand for all system airports. In some cases, the surplus exceeds 90 percent. In particular, New Castle Airport has the highest demand, but there are more than four separate entrance ways to the Airport - spreading peak hour demand.

Table 4-9 - Existing Surface Access Demand				
Airport Name	Access Road	2025 Peak Hour Vehicle Trips ¹	Existing Hourly Roadway Capacity ²	2025 Surplus or (Deficit)
Chandelle Estates	Route 9	16	200	184
Chorman Airport	Nine Foot Road	54	200	146
Civil Air Terminal at Dover AFB	Horsepond Road	132	400	268
Delaware Airpark	State Route 42	66	200	134
Jenkins Airport	Westville Road	7	200	193
Laurel Airport	State Route 24	26	200	174
New Castle Airport	US 13, State Routes 273,58, & 202	226	1,000	774
Smyrna Airport	State Route 6	7	200	193

Table 4-9 - Existing Surface Access Demand				
Summit Airport	US 301	125	400	275
Sussex County	Airport Road, S Railroad Ave	110	400	290

¹ Vehicle trips estimated from general aviation industry averages of 2.35 times peak hour operations (originally published in Aviation Demand and Airport Facility Requirement Forecasts for Medium Air Transportation Hubs Through 1980). This number accounts for pilots, passengers, and employees at the airport.

² Estimated minimum capacity of 200 hourly vehicles for airport ingress and egress turn lanes

2.7 Summary of Findings

It is important at this point in the study to assess the findings that have resulted from the analysis. Further, these findings will have implications on the direction and focus of the alternatives analysis. This chapter has centered around the needs of the aviation system based on the goals and objectives of the plan. As such there were three main criteria used to assess the "system" needs of Delaware airports.

- Demand/Capacity Relationships
- Airport Locational Standards
- Airport Master Planning Recommendations

Airport upgrades and facility needs based on these criteria affect 9 of the 10 system 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 84 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. The alternatives analysis (Chapter 6) will consider the entire range of facility requirements and associated costs including land acquisition, pavement overlays, airfield lighting, and miscellaneous items.

Chapter 5: Identification of Alternatives

IDENTIFICATION OF AVIATION SYSTEM ALTERNATIVES

THE STATE AVIATION SYSTEM PLAN UPDATE (PHASES I and II) is taking a new 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 needed 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: Inventory of System Condition and Performance
- Element 3: Forecast of Aviation Demand
- Element 4: Demand/Capacity & Aviation System Needs

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

- Are there alternative solutions to aviation challenges in Delaware?
- What factors must be considered in order to reach the best solution?
- How does the Aviation Advisory Committee and public interact in the decision process?
- 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?
- What technical tools (GIS., etc.) would be helpful in administering the system?
- How will Homeland Security impact the general aviation airports system and what must the State do to plan for this?

Other outputs of the Phase II study address the sources of funding for aviation development, impacts of the aviation system on the environment, and impact of the aviation system on other transportation systems within the State. Phase II builds on the results of the Phase I work and serves to provide State decision makers with enough information to carry out sound aviation policy initiatives. 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 could be considered for development as alternatives are:

- The No Action Alternative
- An Expansion of the Existing Aviation System Alternative
- A Contracted System of Airports 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?
- Where will the bottlenecks appear, if at all?
- What are the physical development needs of the system?

Briefly, the answers to these questions can be summarized as follows:

1.1 Delaware's Most Pressing Aviation Issues

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

- The Need for Airport Security Programs
- The Need to Mitigate or Remove Airport Airspace Obstructions
- Air Transportation Access in Central Delaware
- The Need to Identify Economic Impacts of Aviation in Delaware
- Airline Service Outlook for Delaware Citizens
- The Need to Preserve Available Landing Sites
- Airport/Community Land Use Compatibility
- The Need for Helicopter Landing Sites in Coastal Areas
- The Coordination of SASPU with Other Transportation Planning & the Public
- The Need for Geographic Information System Data for Delaware Airports
- Legislative Initiatives for Aviation
- The Growth of Corporate Aviation and Proliferation of Very Light Jets
- The Future of Military Aviation in Delaware
- The Need for Reliable Airport Operations Counts
- Safety at Privately Owned, Private-use Airports
- The Need for Aviation Program and Development Funding

1.2 Delaware's Overall 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 **The Present Makeup of Delaware's Aviation 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 = 506; total annual aircraft operations = 315,700.
- **Airspace Structure and Nav aids:** 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 506 in 2005 to 692 by the year 2025. Aircraft operations are anticipated to grow from 315,700 to 444,600 during the same period.

1.5 **Aviation Activity Bottlenecks in the State:**

- **Publicly Owned, Public-Use Airports:** Airport capacity will not be exceeded for any of the system airports over the 20 year period. New Castle Airport will begin to approach its capacity limitations at the end of the period, using 84 percent of its available capacity. This level of activity will create over 3,800 annual hours of aircraft delay. The next closest publicly owned airport to reach its capacity is Sussex County Airport with 49 percent by the year 2025.
- **Privately Owned, Public-Use Airports:** Chorman Airport is anticipated to reach 76 percent of its capacity within 20 years, however this can be remedied through the development of a new taxiway. Summit Airport is forecast to reach 56 percent of its

annual capacity by 2025. No other privately owned, public-use airport is anticipated to reach as much as 33 percent of its available capacity.

1.6 Physical Development Needs of the System:

- **Impacted System Airports:** Airport upgrades and facility needs were identified for eight (8) of the eleven (11) aviation system facilities carried through this analysis. Of these eight (8) airports, five (5) need upgrades to their runway or taxiway systems and 8 airports have landside improvement needs listed. No improvements were identified for the DELDOT Helistop.
- **Airfield Improvements:** Airfield improvements, including runway extensions or upgrades and taxiway improvements were identified for Chandelle Estates Airport, Chorman Airport, Delaware Airpark, Summit Airport, and Sussex County Airport.
- **Landside Improvements:** 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 12,600 square yards of apron area are needed at system airports within the planning horizon.

The results of the Phase I study are being used as inputs for the Phase II conclusion of the study. Input from the Aviation Advisory Committee on each of the upcoming work elements is vital to the success of the overall plan.

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 which were considered for development as alternatives included:

- ***The No Action Alternative:*** This alternative is based on an analysis of the adequacy of the existing aviation system.
- ***An Expansion of the Aviation System Alternative:*** This alternative considers the potential impacts of the addition of new or expanded airport and heliport facilities in the State. This may include the recent addition of airline service at New Castle Airport, greater air cargo use of the Civil Air Terminal at Dover AFB, and full integration of an expanded Delaware Airpark into the central Delaware aviation system. In addition, helicopter landing sites in the coastal area of Sussex County will be examined.
- ***A Contracted System of Airports Alternative:*** This alternative considers potential closures of privately owned airports and associated impacts.

In addition to these major alternatives, two significant subsystems were considered:

- ***Central Delaware Mini-System:*** The current effectiveness of the Delaware Airpark/Civil Air Terminal “mini-system” will be analyzed. At the heart of this analysis is the question of effective air transportation access to central Delaware. Can the Civil Air Terminal be counted on as a permanent public-use facility? In addition, the question concerning the appropriateness of Delaware Airpark as the best publicly owned general aviation airport in central Delaware will be confirmed through a reexamination of the airport site selection process.
- ***Heliport Subsystem:*** Questions surrounding the availability of permanent and temporary helicopter landing sites throughout the State will be examined in this subsystem. The availability of emergency aerial medical evacuation sites throughout the State and potential public-use landing sites in coastal Delaware will be studied.

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

Table 5-1 - Year 2025 Forecast 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	28	8,000	28	8,000	0	0
Chorman Airport	49	38,400	49	38,400	0	0
Delaware Airpark	57	46,400	57	46,400	134	76,200
DELDOT Helistop	0	50	0	50	0	50
Dover AFB ¹	0	1,400	0	1,760	0	0
Jenkins Airport	25	3,200	25	3,200	0	0
Laurel Airport	22	12,200	22	12,200	0	0
New Castle Airport	331	176,800	331	176,800	331	176,800
Smyrna Airport	8	3,000	8	3,000	0	0
Summit Airport	98	84,300	98	84,300	102	85,800
Sussex County Airport	74	70,900	74	70,900	125	105,800
New Heliport(s)	N/A	N/A	3	450	N/A	N/A
GRAND TOTALS	692	444,650	695	445,460	692	444,650

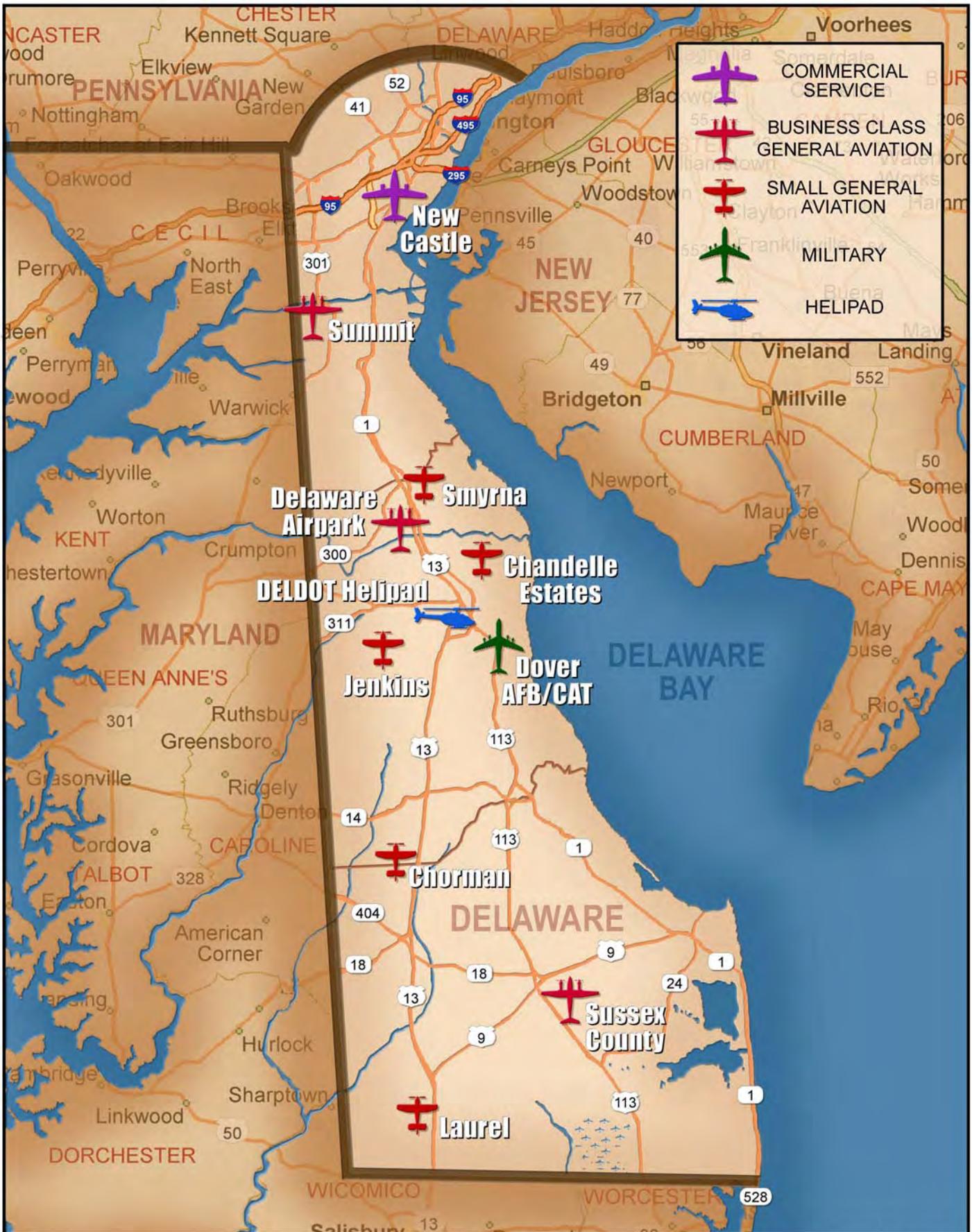
Each alternative system is described in the following sections.

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.

¹ Represents general aviation activity only.

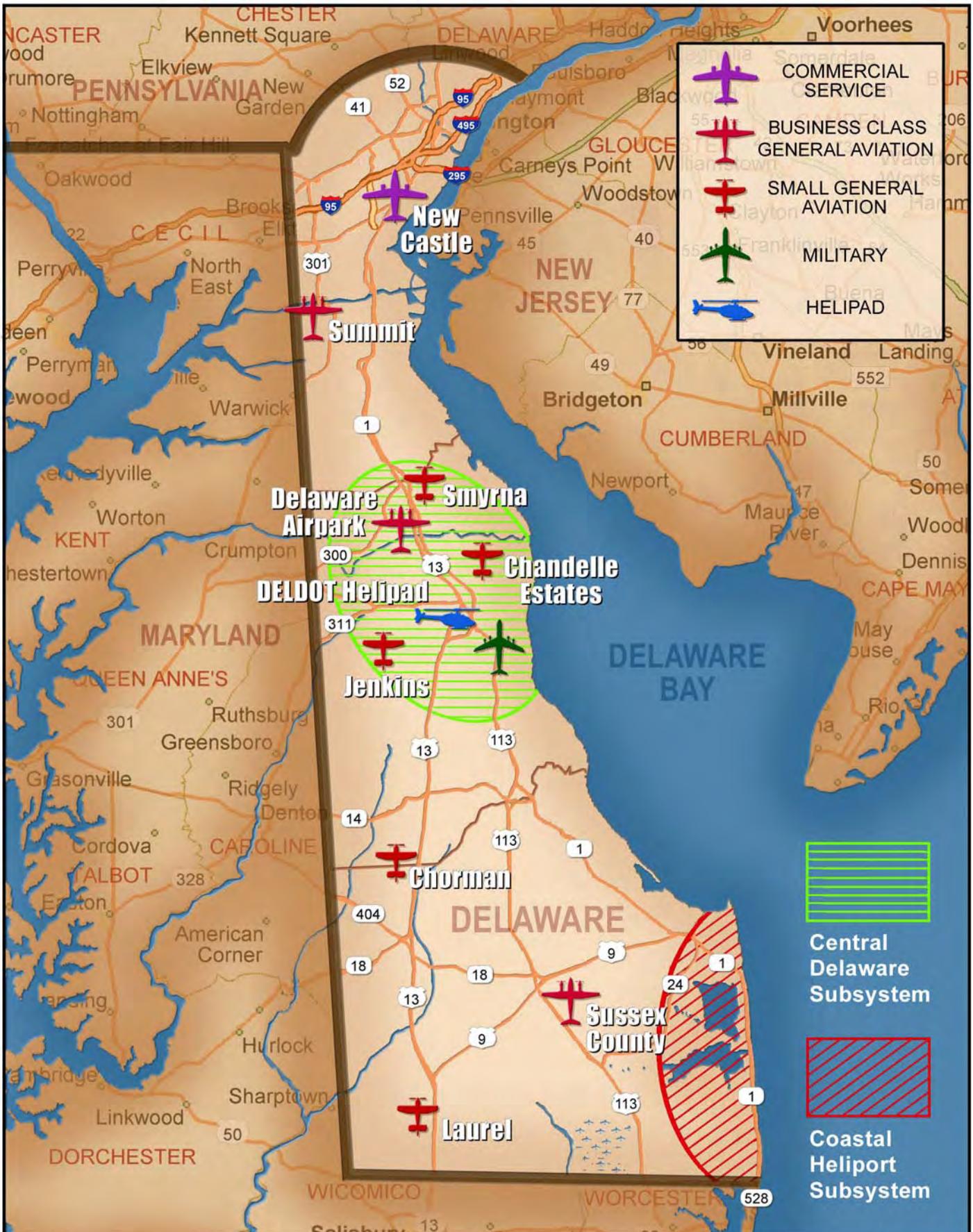


2.2 Alternative 2 - Expansion of the Aviation System

Alternative 2 is called the “Expansion of the Aviation System” because it considers new airports and heliports or expanded existing airports as part of the future aviation system. It is actually a synthesis of a number of different actions that would ultimately expand the existing system.

Based on the forecasts of air traffic, the Air Force's receptivity toward full joint use of Dover AFB, the public ownership of Delaware Airpark, the possible acquisition of development rights at one or more privately owned airports, and the feasibility of new coastal heliports or landing sites in Sussex County, an expanded airport system was identified. This system includes all of the existing system airports plus Dover AFB and any new public use heliports to serve the coastal areas of Sussex County. The planning standards used are those established in Phase I and those established by the Federal Aviation Administration (FAA) with respect to facility requirements needed to accommodate the forecast traffic volumes, giving full consideration to factors such as operational efficiency, safety, environmental concerns, and development costs. Expansion requirements are given in terms of additional land, airfield improvements, building areas, terminal access, and landside facilities.

One significant issue considered in this Alternative involves the preservation of aviation landing sites. In this regard, an analysis was completed in Phase 1 showing the geographic coverage of airports within the State. Preservation of landing sites is important for two primary reasons: 1) Meet aviation system planning criteria for geographic accessibility and coverage; and 2) Provide future Delaware residents with access to the National Airspace System as envisioned by the National Aeronautics and Space Administration (NASA) program called “SATS” (Small Aircraft Transportation System). In this regard, a preliminary analysis of the State aviation system indicates that without any of the privately owned airports, gaps in geographic coverage exist for Laurel Airport and for Chorman Airport to a lesser extent. These gaps would be added to the existing airport service void in coastal Delaware. With regard to the SATS program, NASA envisions a time when personal air transportation will be normal for many Americans. As aircraft become more technology equipped, they will be able to fly with very little human control needed other than preflight programming. However, for the NASA program to be effective, there must be an adequate number of local landing sites available in the future. Good planning and long-range vision would incorporate the preservation of aviation landing sites into the SASPU. Figure 5-2 presents a graphic depiction of Alternative 2 while Table 5-1 (presented earlier) shows the forecast based aircraft and operations associated with each system airport. The Helicopter subsystem is shown later in Figure 5-5.



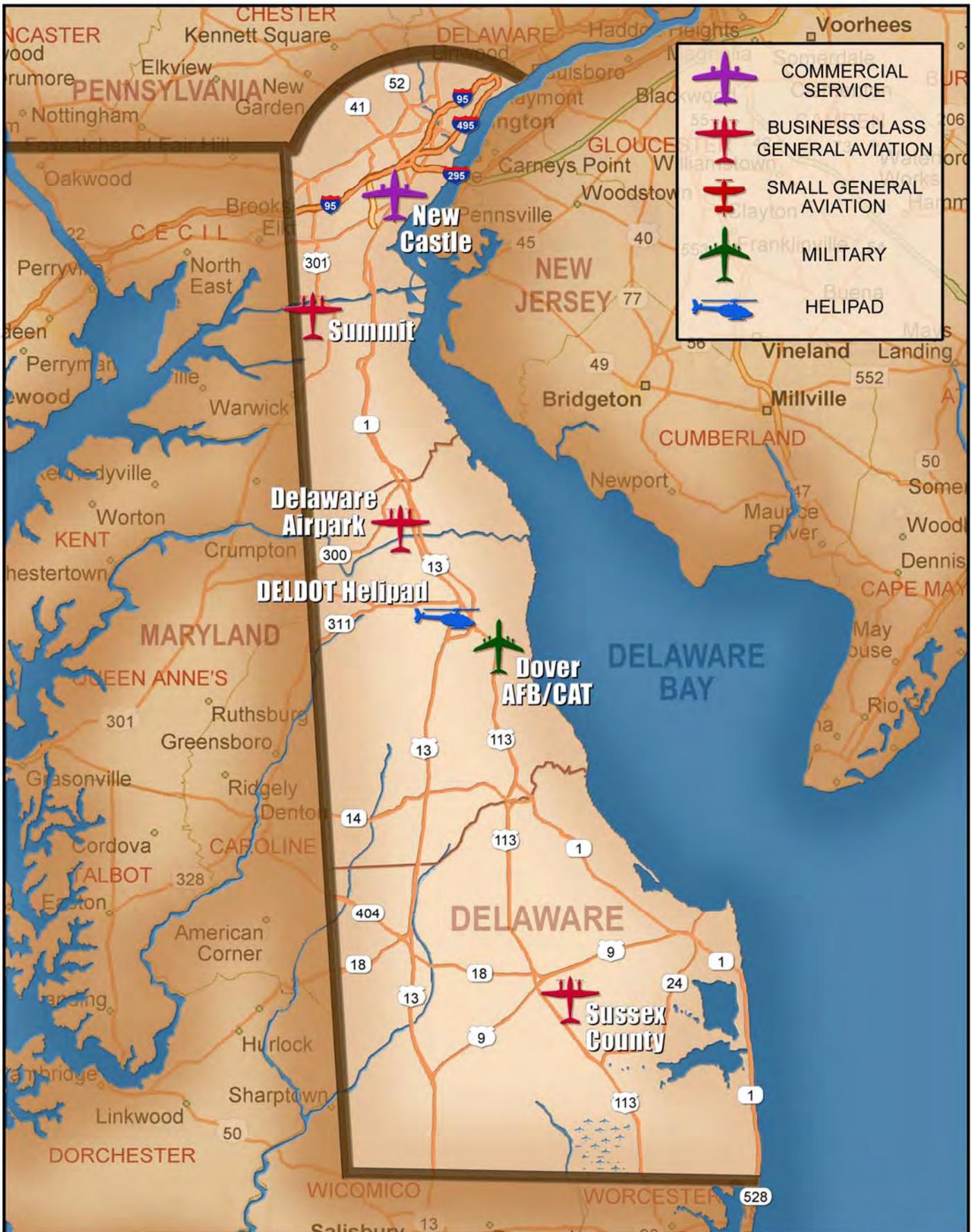
2.3 Alternative 3 - Contracted Airport System

Alternative 3 is called the “Contracted Airport System” 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 2025 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 viability and long-term grant assurances with FAA. Summit has been the recipient of federal funding and has been designated a reliever airport to the Philadelphia airport system.

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, the Central Delaware Mini-system analysis 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.



2.4 Central Delaware Mini-System

The purchase of Delaware Airpark by the State of Delaware in August of 2000 was the first step in creating greater air transportation access to central Delaware. The original plan was to accommodate general aviation aircraft up to twin engine propeller types (e.g. Beech King Air) while Dover AFB would accommodate the business jet activity. This plan assumed full civil-military joint use of Dover AFB. The previous Delaware Aviation System Plan Update examined the joint use issue with Dover AFB and concluded that full general aviation aircraft access was not only feasible but would likely be resolved shortly after the completion of the Plan. That recommendation was made prior to 9/11/2001. After the attacks on America, the prospect of full joint use faded. Dover AFB remained closed to general aviation traffic for six months after 9/11. Various alert levels have temporarily closed the Base to general aviation since then. Because there are questions concerning the implementation of the original Delaware Airpark-Dover AFB “mini-system” this sub-alternative must examine the different options available for general aviation (Figure 5-4).

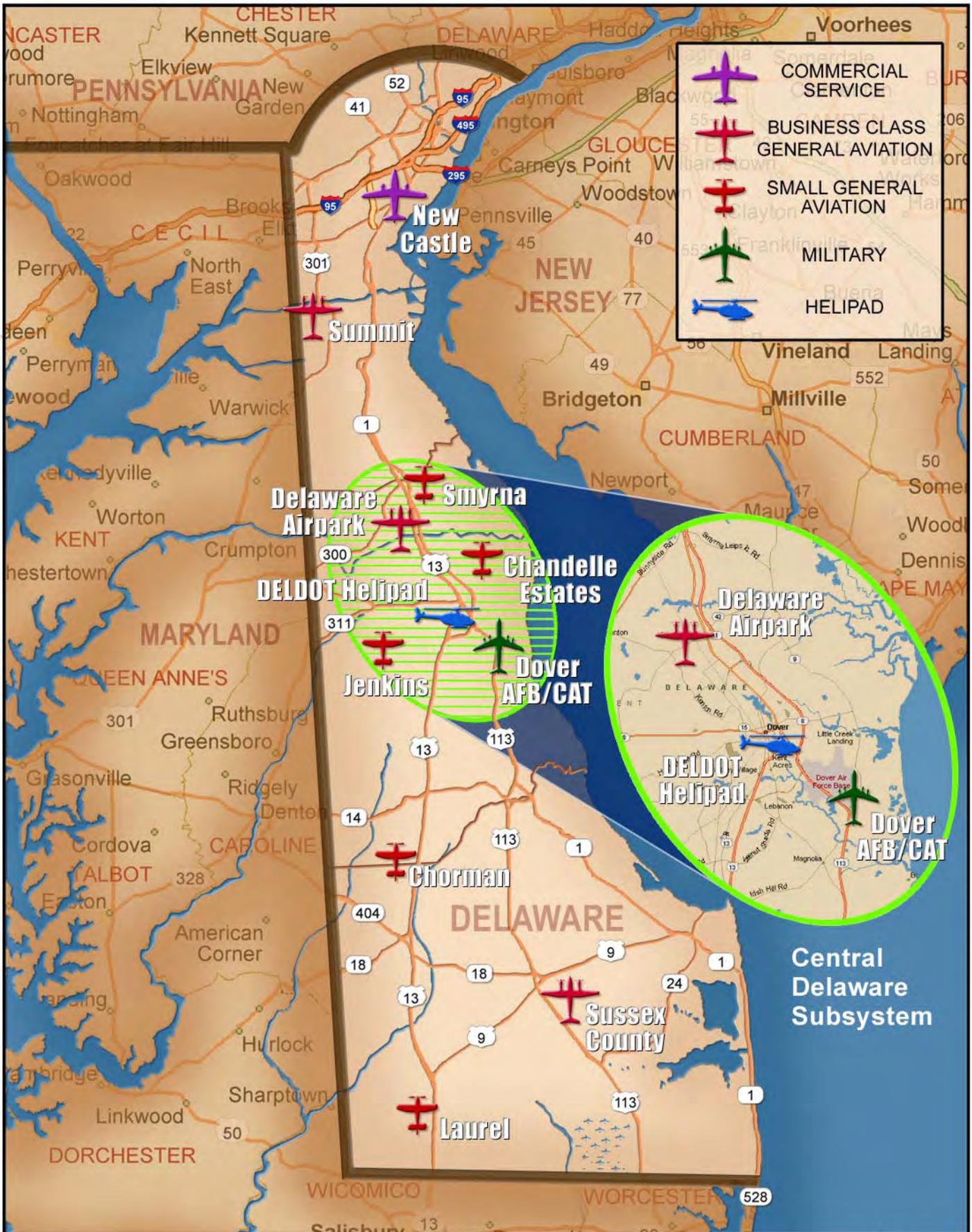
There are a number of possibilities that are examined in this subsystem:

- **Expanded Delaware Airpark with Full Joint-Use of Dover AFB:** This option includes the development of a new 4,200 foot runway at Delaware Airpark along with relatively open joint-use of Dover AFB. As a military base, there will likely not be unfettered access by civilian aircraft, but this option will examine the best case. It is assumed that the large business jets, NASCAR race team aircraft, and large air cargo aircraft would use the Civil Air Terminal, while smaller propeller and turboprop aircraft would use Delaware Airpark. This option is congruent with the system Alternative 2 - Expansion of the Existing System.
- **Sole Dependence on Delaware Airpark:** This option assumes that Dover AFB is no longer available for joint-use operations. Similar to Alternative 3, it is assumed that all of the privately owned airports in Kent County will eventually close. Thus, all civilian aviation operations in Kent County must rely on Delaware Airpark. This option, similar to Alternative 3, must gauge the impacts and requirements of such a scenario.
- **Delaware Airpark Plus Privately Owned Airports:** This option assumes that Dover AFB is not available for civilian use, but that all of the other existing public and private airports are available for use. This option is not covered by any of the larger system Alternatives.

Each of these options will be discussed in the Evaluation of Alternatives.

2.5 Heliport Subsystem

Helicopters play a vital role in the safety, security, and economic activity of the State. In this regard, helicopters are used for the following purposes:

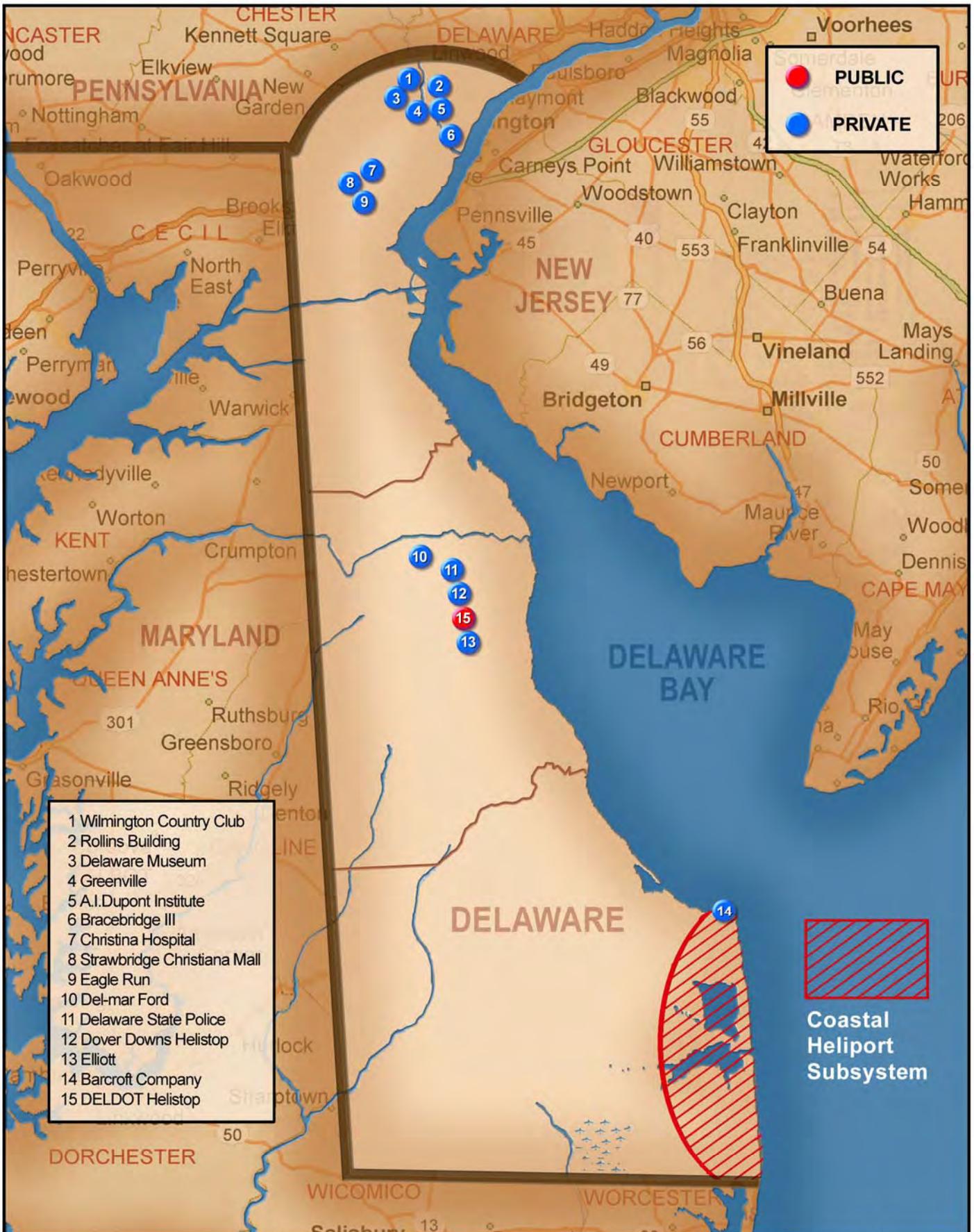


- **Economic:** Heliports help attract and keep businesses that use helicopters. A large majority of U.S. and international corporations own, lease, or charter helicopters to transport their top executives and clients.
- **NASCAR Race Weekend:** Helicopter transportation is an important part of the NASCAR race weekend. During this period, drivers and race teams are transported from the Civil Air Terminal and other airports directly to Dover Downs.
- **Emergency/Disaster Relief:** Having a system of strategically placed facilities can provide an emergency system of landing/staging areas in the event of a local or regional disaster. The Delaware State Police has a heliport in Dover and also bases helicopters at Summit and Sussex County Airport.
- **Medical Use:** The use of helicopters as aerial ambulances has made heliports at trauma centers an essential part of the total patient-care system.
- **News Gathering/ Reporting Traffic and Safety:** Some local TV and radio stations use helicopters to provide current news, traffic reports and, in some cases, lifesaving information to the public.
- **Utility, Forest and Resource Management:** Heliports support helicopters that patrol and repair critical power transmission lines, fight forest fires, and survey vast areas without the need for disturbing the environment.

Currently, there are fifteen heliports in the State of Delaware. Deldot Helistop is the only public-use heliport while the other fourteen heliports are private-use. Most of heliports are located in three clusters: six (6) are located around Wilmington, three (3) are located around Christiana, five (5) are located around Dover, and one is located near Lewes. Of the 15 heliports, seven (7) are concrete, five (5) are turf, and three (3) are asphalt landing pads. Bracebridge III Heliport owned by the MBNA Corporation and the Strawbridge Heliport are the only rooftop heliports listed in the FAA's on-line inventory². There are currently 620 registered helicopters in the State of Delaware and only 26 of those are based at public-use airports. Even if the remaining 15 heliports all had at least one helicopter, there would still be less than 50 helicopters actually located in Delaware.

Figure 5-5 shows the network of heliports in Delaware. The Evaluation of Alternatives will examine this network including beach access and emergency response transfer facilities. One portion of the analysis will examine the feasibility and need for coastal heliport sites to serve the beach communities in Sussex County while another portion of the analysis will focus on the need for helicopter landing sites for emergency medical evacuation and disaster relief.

² Source: <http://www.gcr1.com/5010WEB/>



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 evaluate 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 both general aviation and potential airline demand.
- **Airspace Compatibility:** Do any of the alternatives create airspace conflicts?
- **Impact on Surface Transportation System:** The evaluation uses DelDOT modeling on driving times to Central Business Districts, and examines the need for turn lanes and other highway improvements at airports where surface access demand warrants. The evaluation includes an examination of surface access to four major system airports where congestion may become a problem: Delaware Airpark, New Castle Airport, Summit, and Sussex County.
- **Environmental & Land Use Compatibility:** Which alternatives create the least impact on the environment? Which alternatives are most compatible with existing and planned land uses around the airports?
- **Developmental Costs:** What is the most cost effective alternative?
- **Sociopolitical Acceptability:** Once the technical analysis is completed, there needs to be a review with regard to sociopolitical acceptability. That is, which alternatives are popular with aviation industry users, planners (DVRPC, DelDOT, etc.) and local residents? The Delaware Aviation Advisory Committee (DAAC) will be the sounding board for this factor.

As a part of the evaluation, the existing mini-system in central Delaware that includes the use of Delaware Airpark and Dover Air Force Base's Civil Air Terminal (along with the privately owned, public use airports in Kent County) was re-examined in Section 8 of this chapter. In this regard, it is important to track the changes that have occurred since 9/11/2001 in the use of the Civil Air Terminal by corporate aviation desiring to access central Delaware. As a part of this

examination, surveys of current and past users were employed to determine if the three-day prior permission requirement, flight manifests, indemnification agreement, etc., implemented after 9/11/01 have reduced potential use of the facility. Steps in the process included the following:

- Survey of current and past users of the Civil Air Terminal
- Estimates of potential critical aircraft demand for each facility
- Confirmation of previous central Delaware general aviation site selection study findings
- Analysis of potential expansion at Delaware Airpark to accommodate more corporate aviation

This analysis will be reviewed by the DAAC to ensure that Delaware stakeholders have input to the results of the analysis.

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 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.

The results of this evaluation process were quantified for use in the evaluation matrix. Each airport in each alternative was assigned a relative score based upon the criteria presented above. These individual scores were then totaled for each alternative with respect to this criterion - the ability to serve forecast demand. 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).

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 “No Action” Alternative because it examines the adequacy of the existing system in Chapter 4 without changes or improvements. This alternative serves as a baseline comparison to each of the “action” alternatives (2 and 3) and subsystems.

Alternative 2 is called the “Expansion of the Aviation System” because it considers the Air Force’s receptivity toward full joint use of Dover AFB, the possible acquisition of development rights at one or more privately owned airports, the preservation of aviation landing sites in the State

of Delaware, and the feasibility of new coastal heliports or landing sites in Sussex County.

Alternative 3 is called the “Contracted Airport System” because it examines the impacts created with the loss of certain privately owned airports in the State. Under this alternative, five of the 10 existing system airports were assumed to close by the year 2025 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 future 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. Airfield facility capabilities are shown in Table 6-1. Relative ranking from these capabilities are translated into a matrix score later in Table 6-4.

Table 6-1 - Airfield Service Capabilities, by Alternative					
Alternative/Airport	Number of Runways	Taxiway System Type	Annual Service Volume	Forecast Demand (Year 2025)	Airfield Capacity Surplus
ALTERNATIVE 1					
Chandelle Estates	1	Turn-Around	46,200	8,000	38,200
Chorman Airport	1	Turn-Around	50,500	38,400	12,100
Delaware Airpark	1	Full Parallel	173,800	46,400	127,400
DelDOT Heliport	N/A	N/A	5,000	50	4,950
Dover AFB ¹	2	2 Full Parallels	13,500	1,400	12,100
Jenkins Airport	2	None	41,900	3,200	38,700
Laurel Airport	2	None	37,900	12,200	25,700
New Castle Airport	3	Full Parallel & 2 Partial Parallels	190,000	176,800	13,200
Smyrna Airport	1	None	46,000	3,000	43,000
Summit Airport	2	Full Parallel & None	150,200	84,300	65,900
Sussex County Airport	2	Full Parallel & None	143,200	70,900	72,300
TOTAL FOR ALT. 1	17		898,200	444,650	453,550
ALTERNATIVE 2					
Chandelle Estates	1	Turn-Around	46,200	8,000	38,200
Chorman Airport	1	Turn-Around	50,500	38,400	12,100

Table 6-1 - Airfield Service Capabilities, by Alternative					
Alternative/Airport	Number of Runways	Taxiway System Type	Annual Service Volume	Forecast Demand (Year 2025)	Airfield Capacity Surplus
Delaware Airpark	1	Full Parallel	173,800	46,400	127,400
DelDOT Helistop	N/A	N/A	5,000	50	4,950
Dover AFB ¹	2	2 Full Parallels	13,500	1,760	11,740
Jenkins Airport	2	None	41,900	3,200	38,700
Laurel Airport	2	None	37,900	12,200	25,700
New Castle Airport	3	Full Parallel & 2 Partial Parallels	190,000	176,800	13,200
Smyrna Airport	1	None	46,000	3,000	43,000
Summit Airport	2	Full Parallel & None	150,200	84,300	65,900
Sussex County Airport	2	Full Parallel & None	143,200	70,900	72,300
New Heliport(s)	N/A	N/A	5,000	450	4,550
TOTAL FOR ALT. 2	17		903,200	445,460	457,740
ALTERNATIVE 3					
Delaware Airpark	1	Full Parallel	173,800	76,200	97,600
DelDOT Helistop	N/A	N/A	5,000	50	4,950
New Castle Airport	3	Full Parallel & 2 Partial Parallels	190,000	176,800	13,200
Summit Airport	2	Full Parallel & None	150,200	85,800	64,400
Sussex County Airport	2	Full Parallel & None	143,200	105,800	37,400
TOTAL FOR ALT. 3	8		662,200	444,650	217,550

¹ Alternative 1 and 2 assumes that the current joint use agreement limits activity to 13,500 annual operations.

As shown, Alternative 2 has the greatest surplus airfield capacity (457,740 operations), followed by Alternative 1 (453,550 operations), and then Alternative 3 (217,550 operations).

In addition to airfield capacity, an important distinction between the “No Action” (Alternative 1) and the “Action” Alternatives (Alternatives 2 and 3), is the condition of the runway system by the end of the 20 year planning period. Without improvement, the paved runway systems will be in significant need of repair. This factor was incorporated into the scoring system by reducing the scores of the paved facilities in Alternative 1 in the matrix analysis (Table 6-4).

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 an apron area, T-hangars, conventional hangars, terminal building space, and automobile parking space. Table 6-2 presents a summary of additional landside facilities needed for each alternative. Alternative 1 - No Action, is shown with zero scores since, by definition, there are no new facilities.

The unmet need for additional landside facilities indicated deficiencies and were thus scored lower in the summary evaluation table (Table 6-4), later in the analysis. As shown, the two development alternatives (2 and 3) assumed that all facility needs would be met. Conversely, Alternative 1 had the greatest deficiency since no facility development is shown.

Table 6-2 - Additional Landside Facilities, by Alternative					
Alternative/Airport	Apron Area (SY)	T-Hangars (Units)	Conventional Hangar Space (SF)	Terminal Building Space (SF)	Auto Parking (SY)
TOTAL FOR ALT. 1*	0	0	0	0	0
Alternative 2					
Chandelle Estates	1,300	5	0	0	0
Chorman Airport	6,000	30		500	700
Delaware Airpark	0	16	0	0	0
DelDOT Helistop	0	0	0	0	0
Civil Air Terminal	8,600	N/A	N/A	0	805
Jenkins Airport	0	3	0	500	0
Laurel Airport	0	0	0	0	0
New Castle Airport	0	79	0	30,000	0
Smyrna Airport	0	1	0	0	0
Summit Airport	0	16	30,600	0	0
Sussex County Airport	0	28	0	0	0

Table 6-2 - Additional Landside Facilities, by Alternative					
Alternative/Airport	Apron Area (SY)	T-Hangars (Units)	Conventional Hangar Space (SF)	Terminal Building Space (SF)	Auto Parking (SY)
New Heliport(s)	1,200	0	0	0	600
TOTAL FOR ALT. 2	17,100	178	30,600	31,000	2,105
Alternative 3					
Delaware Airpark	8,050	75	11,200	0	0
DelDOT Helistop	0	0	0	0	0
New Castle Airport	0	79	0	30,000	0
Summit Airport	0	16	55,800	0	0
Sussex County Airport	0	65	9,150	0	0
TOTAL FOR ALT. 3	8,050	258	76,150	30,000	0

* Individual airports are not listed since by definition, Alternative 1 is the "No Action" and has no additional landside facility improvements scheduled.

Differences between the development (action) alternatives show the following:

Table 6-3 - Alternative 2 and 3 Differences			
	Alternative 2	Alternative 3	Difference
Additional Apron Area (SY)	8,500	8,050	(450)
Additional T-Hangar Units	178	258	80
Conventional Hangar (SF)	30,600	76,150	45,550
Terminal Building Space (SF)	31,000	30,000	(1,000)
Auto Parking (SY)	2,105	0	(2,105)

Alternative 3 showed greater requirements in the amount of T-Hangars and Conventional Hangar space. These facility needs would result from the potential loss of privately owned airports as suggested in Alternative 3. Other differences between alternatives in apron, auto parking and terminal building space were minimal.

Matrix Scoring for Ability to Serve Forecast Demand

In order to score the alternatives in a manner that would permit comparisons to other alternatives, a method of scoring was developed that measured differences in the level of facilities

needed. First, it was assumed that no improvements to airfields or airfield capacity would be developed in Alternative 1. Alternatives 2 and 3, however, were assumed to add needed airfield improvements and capacity as required. Since each airport in Alternatives 2 and 3 will receive additional capacity as needed, each received a “5” score in the airfield service category. This is contrasted to the No Action Alternative which adds no capacity when needed. Thus, each airport in Alternative 1 was scored according to its relative percent of surplus capacity available. Scoring in this process used the following increments:

	Surplus Capacity	Rating Factor
●	1% - 20%	1
●	21% - 40%	2
●	41% - 60%	3
●	61% - 80%	4
●	81% - 99%	5

These scores were adjusted for Delaware Airpark, Summit, and Sussex County in Alternative 1 to reflect the need for runway extensions that would not be constructed. Alternative 1 airfield service scores for airports with **paved runways** were further reduced to reflect the absence of pavement overlays and other such capital improvements, as defined by the baseline Alternative. All of the scores for airfield capacity were positive or zero since no airport in Delaware was forecast to exceed its capacity.

From the mini-system analysis later in this chapter (Section 8), it can be concluded that if Dover AFB were to no longer accept civilian operations, a runway extension would be required at Delaware Airpark to accommodate displaced corporate aviation demand. Alternative 3 assumes that a runway extension would be developed in response to this air access need in central Delaware.

For landside capacity, the No Action (Alternative 1) was also scored differently than any of the “Action” alternatives. While Alternatives 2 and 3 attempt to deal with the lack of needed landside facilities, the No Action Alternative does not. Because of this, the No Action Alternative actually compounds the problems at existing airports by not providing any relief in the form of added landside facilities. With this in mind, the “No Action” was given lower scores to reflect needed landside facilities that were not provided. The “Action” alternatives (2 and 3) were assumed to meet all landside facility needs, and thus, each airport scored a “5” with regard to this criterion.

In order to arrive at a single score for each airport’s ability to serve demand in each alternative, the airfield and landside service scores were averaged. These individual airport averages were then added to get a total for each alternative. Table 6-4 shows the scoring for each airport’s ability to serve forecast demand, along with the cumulative scores for each alternative.

Table 6-4 - Ability to Serve Demand - Matrix Scores for Alternatives									
Airport	Alternative 1			Alternative 2			Alternative 3		
	Airfield Service	Landside Service	Total	Airfield Service	Landside Service	Total	Airfield Service	Landside Service	Total
Chandelle Estates	3.0	3.0	3.0	5.0	5.0	5.0	--	--	--
Chorman Airport	2.0	1.0	1.5	5.0	5.0	5.0	--	--	--
Delaware Airpark	1.0	3.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
DelDOT Helistop	4.0	5.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0
Civil Air Terminal	3.0	3.0	3.0	5.0	5.0	5.0	--	--	--
Jenkins Airport	2.0	4.0	3.0	5.0	5.0	5.0	--	--	--
Laurel Airport	2.0	5.0	3.5	5.0	5.0	5.0	--	--	--
New Castle Airport	1.0	3.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Smyrna Airport	2.0	4.0	3.0	5.0	5.0	5.0			
Summit Airport	1.0	3.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
Sussex County Airport	1.0	3.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0
New Heliport(s)	--	--	0.0	5.0	5.0	5.0			
TOTALS	22.0	37.0	29.5	60.0	60.0	60.0	25.0	25.0	25.0

3. EVALUATION OF AIRSPACE COMPATIBILITY

THIS SECTION DESCRIBES THE RESULTS OF THE evaluation of airspace utilization for each of the alternatives and is organized to include the following major topics:

- Terminal VFR Airspace Utilization
- Terminal IFR Airspace Utilization
- Summary and Ranking of Airspace Utilization Factors

The product of this evaluation was a set of airspace utilization scores for the airports in each alternative to see if any of the alternatives created airspace conflicts.

Terminal VFR Airspace Utilization

Using the airspace and navaids requirements developed in an earlier chapter, a determination was made regarding the future airspace use pattern of each system airport in each alternative. The evaluation of airspace compatibility focused on visual flight rules (VFR) and instrument flight rules (IFR) airspace configurations. The VFR airspace configurations (shown in Figures 6-1 through 6-3) impact an airport's terminal area airspace system in that pilots must operate on a see-and-be-seen basis. Each alternative has a slightly different VFR airspace configuration.

Method of Analysis

In scoring the VFR airspace utilization patterns for each airport in each alternative, a number of factors were considered. These factors included the amount or degree of overlap, the orientation of adjacent airport runways, and the activity levels at the airports most directly affected. For the VFR analysis, scoring was based on a zero (0) to minus five (-5) basis with zero indicating no impact and minus five indicating greatest negative impact. Table 6-5 presents a summary of VFR scores for each alternative.

Terminal IFR Airspace Utilization

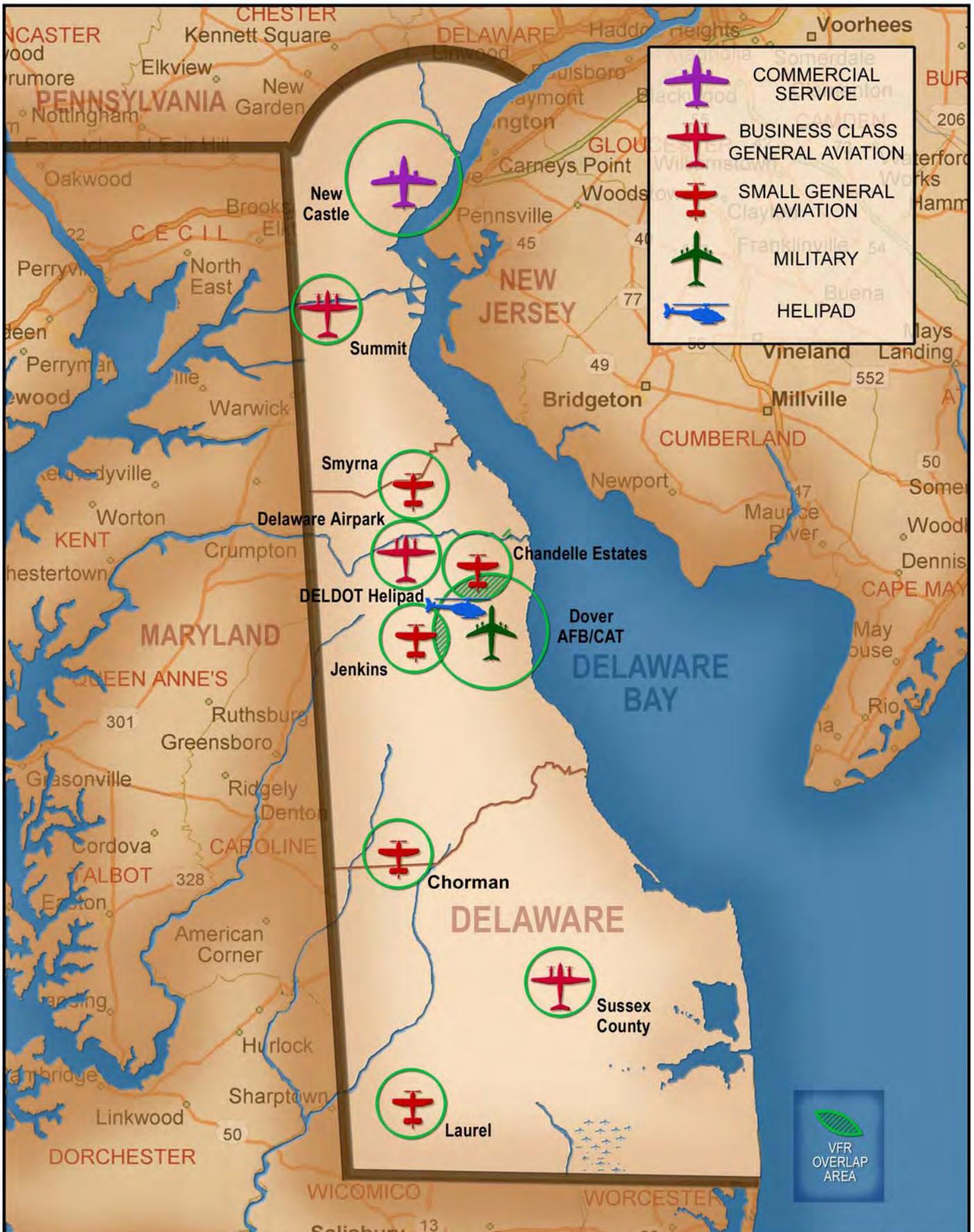
Similar to the VFR analysis, the evaluation of IFR airspace utilization examined the number and type of anticipated instrument approaches at system airports in each alternative. Because IFR conditions imply poor visibility for pilots, greater separation between aircraft is needed than in VFR conditions. Figures 6-4 to 6-6 show the IFR airspace areas associated with each airport in each alternative. These areas are significantly larger than the VFR airspace areas.

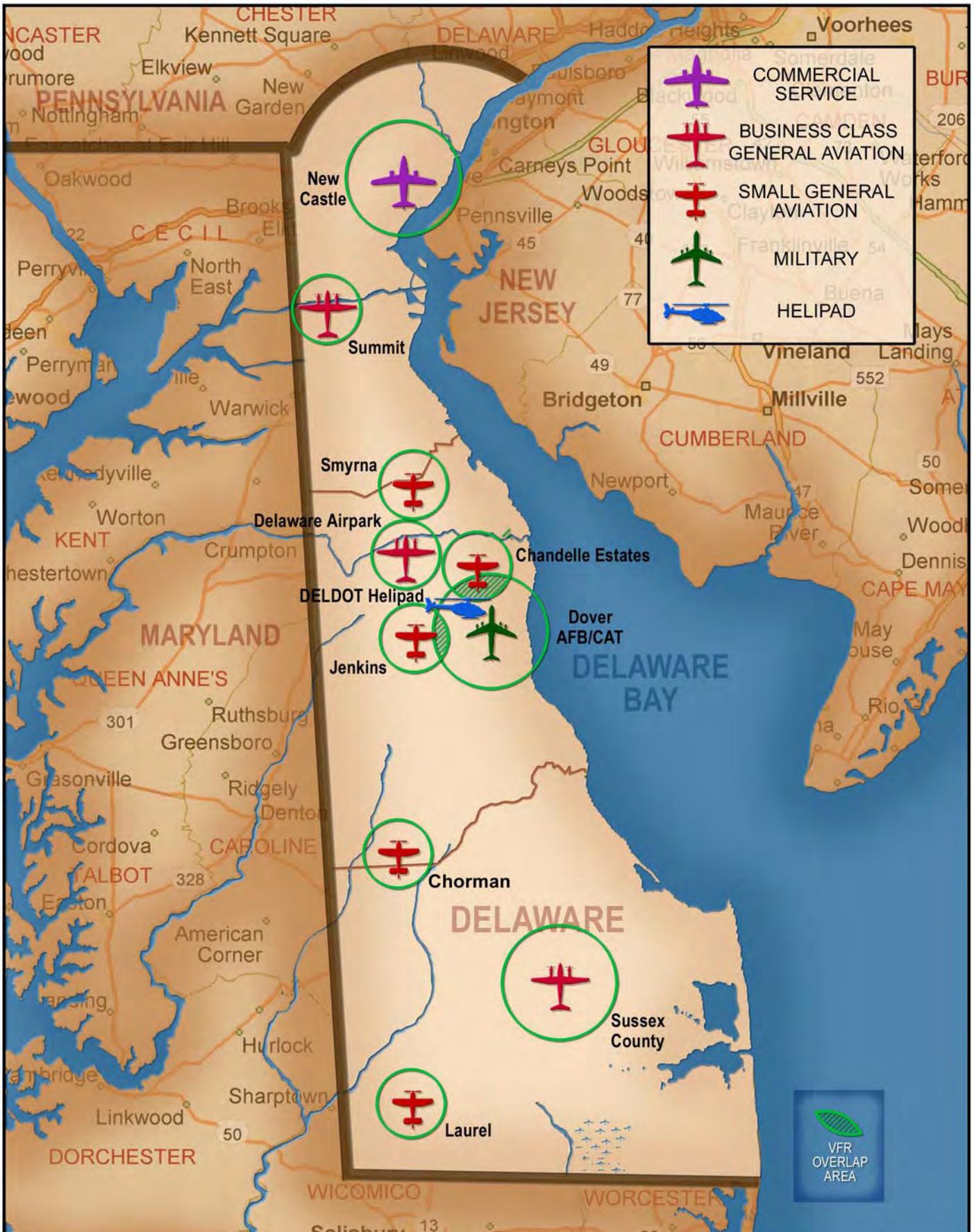
Alternative 1 - No Action, simply used the existing IFR airspace areas and projected these into the future. Alternatives 2 and 3, however, assumed some upgrades to existing approaches at Delaware Airpark and Sussex County Airport and the potential addition of a new instrument approach at Chorman Airport. It is likely that Very high frequency Omnidirectional Range (VOR) instrument equipment will be phased out by the end of the planning period. The approaches available from GPS do not rely upon the location of a ground-based unit such as a VOR and permit

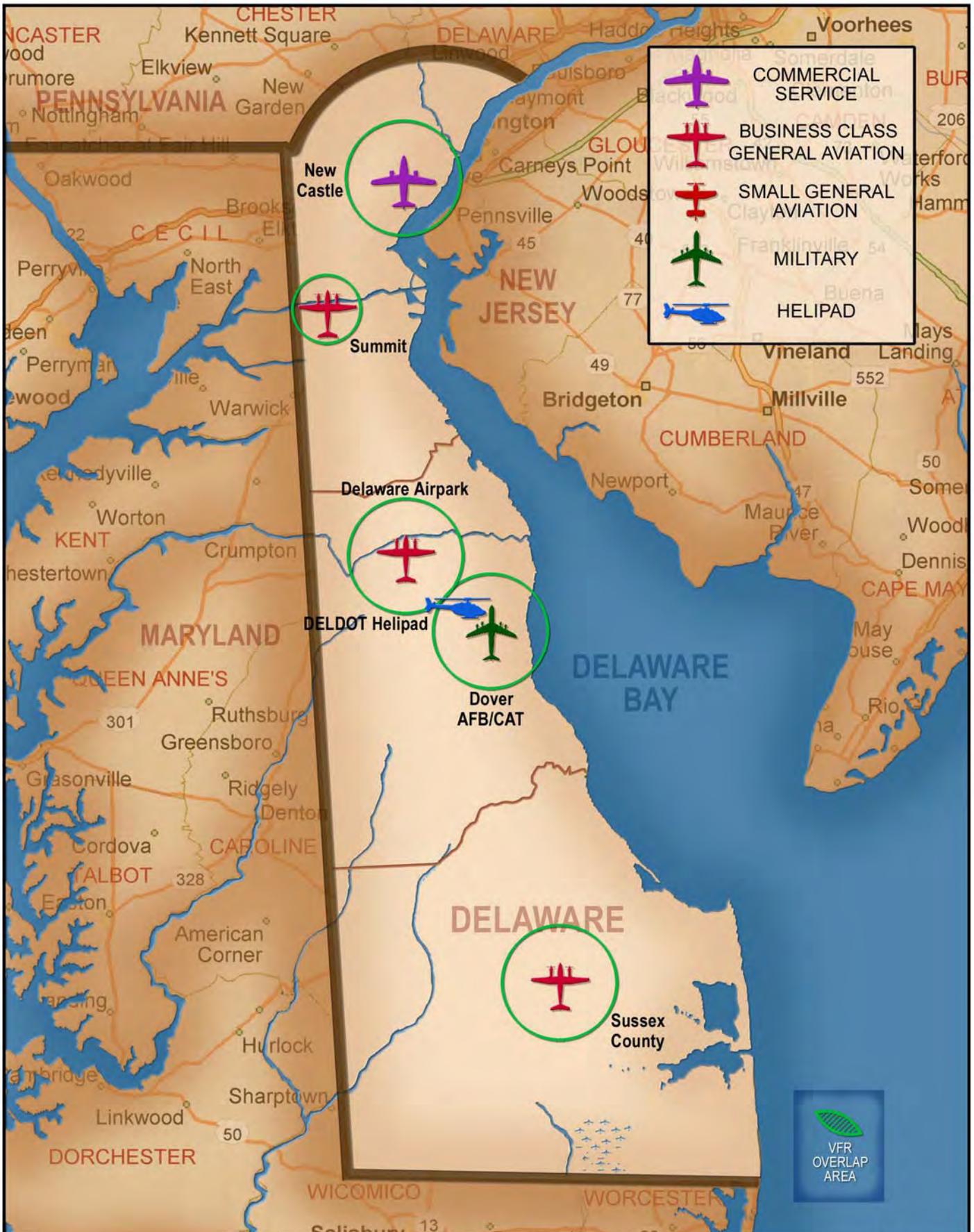
straight-in approaches for properly equipped aircraft. Therefore, IFR airspace areas for Alternatives 2 and 3 featured straight-in approaches. Alternative 3 (without Laurel or Chorman) had the fewest number of IFR capable airports.

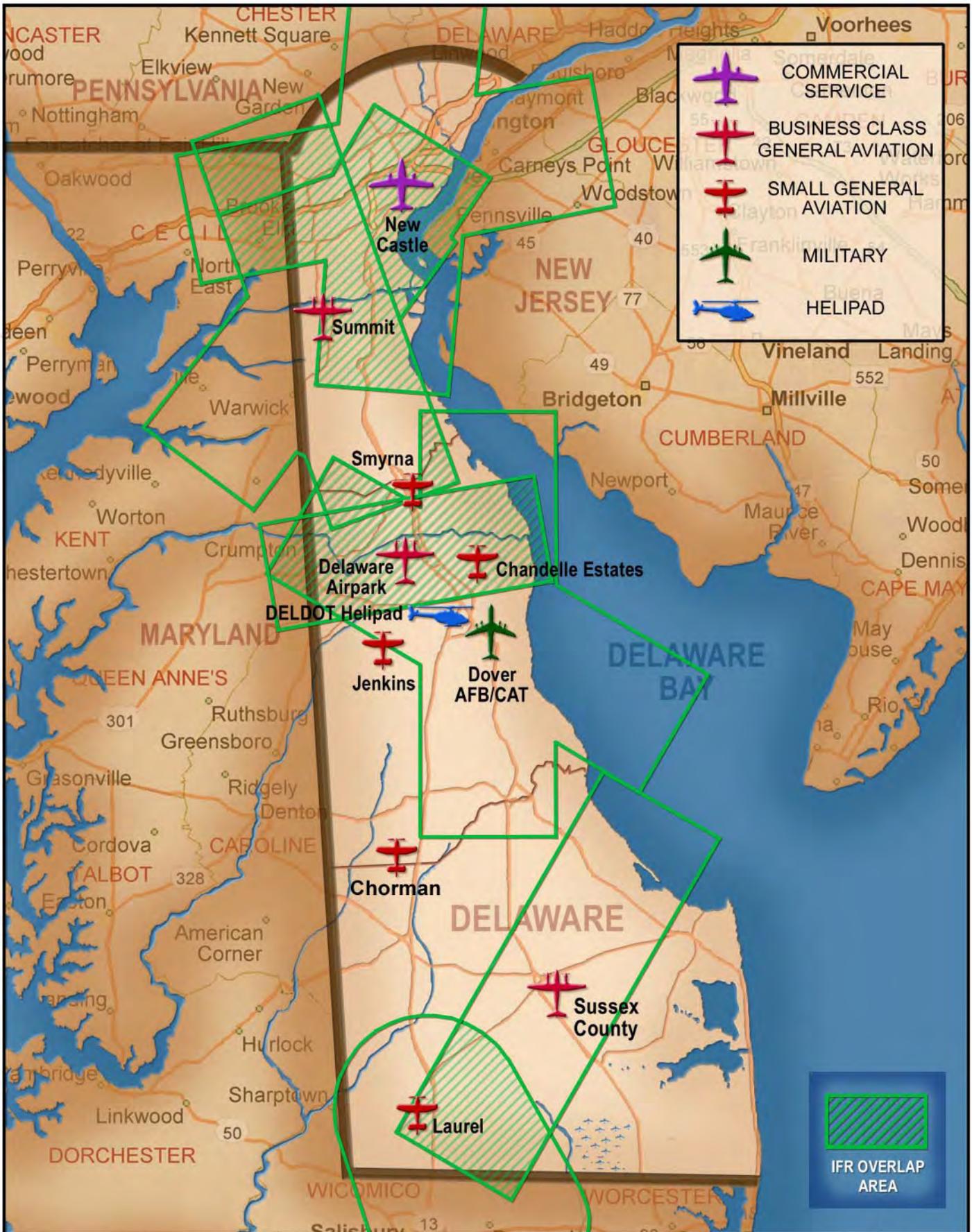
Method of Analysis

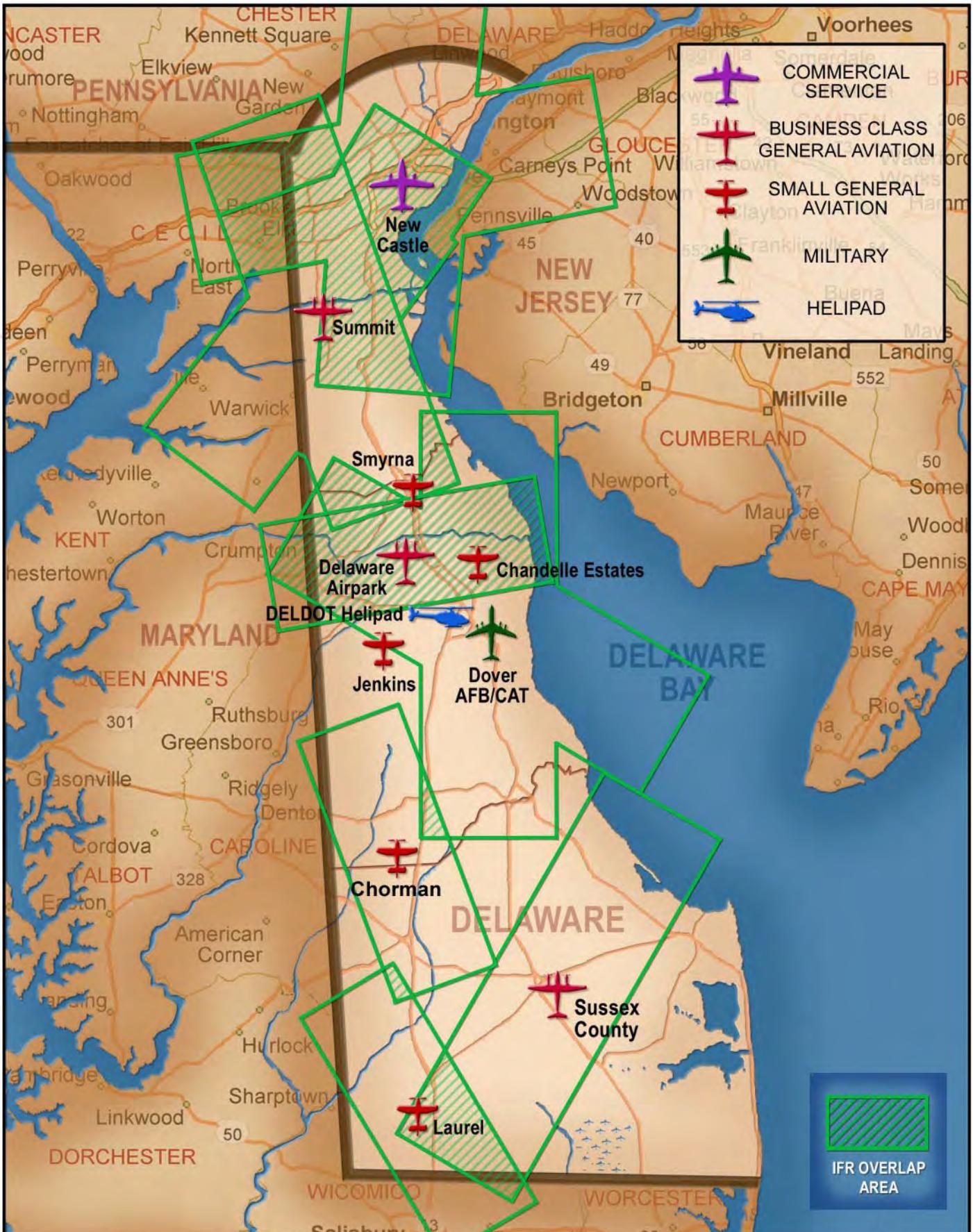
The IFR analysis considered both the degree of overlap and the potential IFR activity at each system airport. In this regard, there were two parts to the scoring process. The first examined IFR airspace area overlaps and rated the degree of overlap with a zero (0) to minus five (-5) rating scale. The second portion of the scoring process examined the operational activity levels at each airport and compared them to a statewide average. The resulting ratio was multiplied by the degree of overlap score and rounded to the nearest tenth of a point. Airports without instrument approaches were not scored with respect to IFR. Important in this process is a balanced scoring system. For example, an airport that has a large overlap combined with a small fractional utilization ratio may score near zero (0) while an airport with a slight overlap and a large IFR utilization ratio could score more than a minus five (-5). Using this method, all of the scores except for New Castle Airport were between 0 and -5.0.

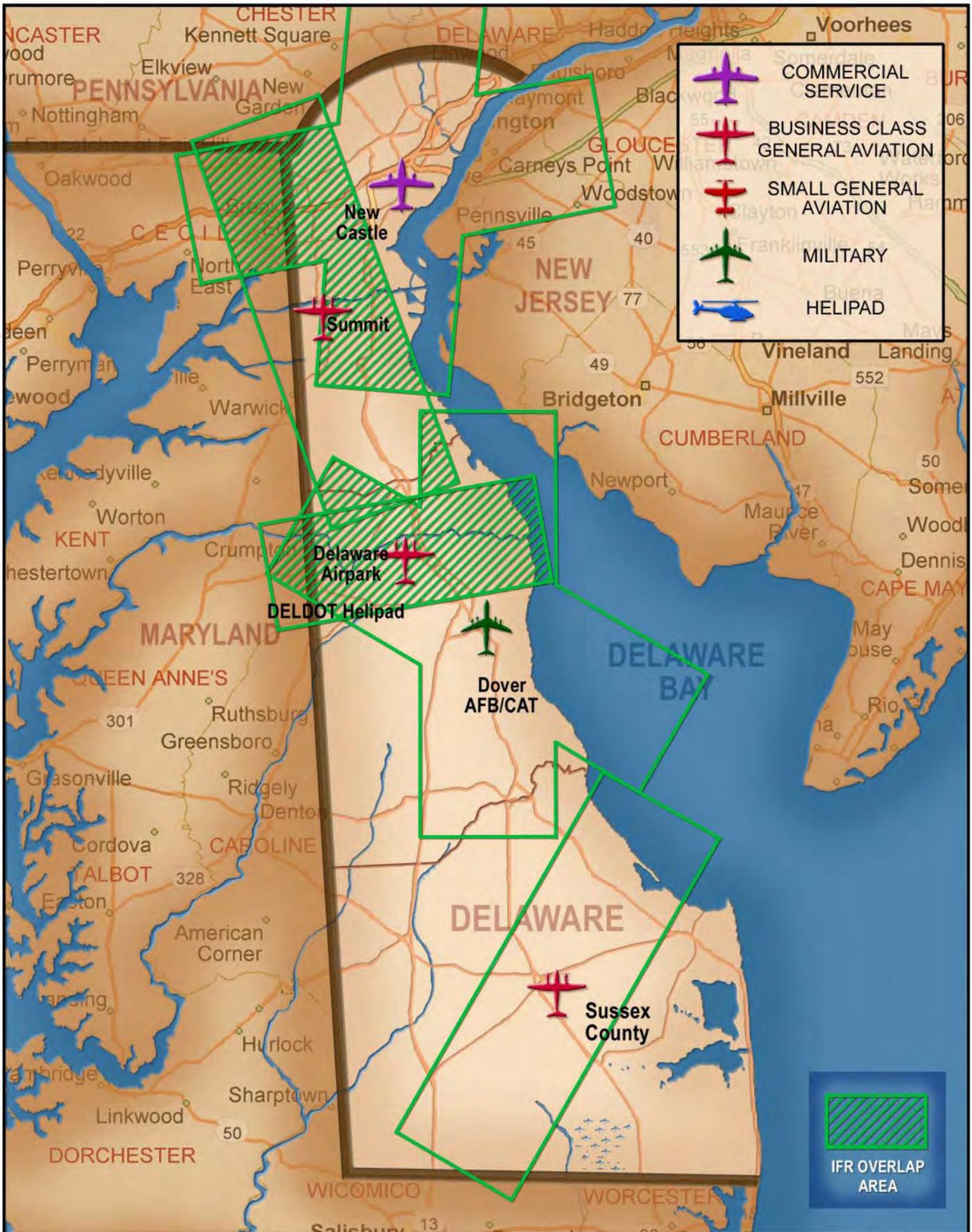












Summary and Ranking of Airspace Utilization Factors

From an evaluation standpoint, the differences between alternatives involved the availability of both VFR and IFR capable airports to relieve congestion at the busier destinations. With more airports, the enroute demand can be spread out. This can serve to reduce delay in the system (if any) as well as provide the aviation users with more options in their flight destinations.

For the scoring system, each of the alternatives was evaluated with respect to two primary sets of criteria: terminal VFR and IFR airspace utilization. To reach an overall score, IFR and VFR scores were averaged. Table 6-5 summarizes the VFR and IFR scores for each airport in each alternative.

Table 6-5 - Airspace Utilization Evaluation									
AIRPORT	Alternative 1			Alternative 2			Alternative 3		
	VFR	IFR	TOTAL	VFR	IFR	TOTAL	VFR	IFR	TOTAL
Chandelle Estates	-4.0	0.0	-2.0	-4.0	0.0	-2.0	--	--	--
Chorman Airport	0.0	0.0	0.0	0.0	-1.5	-0.8	--	--	--
Delaware Airpark	-1.0	-3.7	-2.4	-1.0	-3.7	-2.4	0.0	-3.4	-1.7
DelDOT Heliport	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Civil Air Terminal	-5.0	-1.3	-3.2	-5.0	-1.3	-3.2	--	--	--
Jenkins Airport	-3.0	0.0	-1.5	-3.0	0.0	-1.5	--	--	--
Laurel Airport	0.0	-0.7	-0.4	0.0	-0.7	-0.4	--	--	--
New Castle Airport	0.0	-13.9	-7.0	0.0	-13.9	-7.0	0.0	-8.0	-4.0
Smyrna Airport	-1.0	0.0	-0.5	-1.0	0.0	-0.5	--	--	--
Summit Airport	0.0	-5.0	-2.5	0.0	-5.0	-2.5	0.0	-3.9	-2.0
Sussex County Airport	0.0	-4.2	-2.1	0.0	-4.2	-2.1	0.0	-1.0	-0.5
New Heliports	--	--	--	0.0	0.0	0.0	--	--	--
TOTALS	-14.0	-28.8	-21.4	-14.0	-30.3	-22.2	0.0	-16.3	-8.2

Overall ranking of alternatives with respect to airspace utilization was as follows:

- Alternative 3 First: -8.2 Points
- Alternative 1 Second: -21.4 Points
- Alternative 2 Third: -22.2 Points

These scores indicate that Alternative 3 is likely to create the least potential airspace conflicts, while Alternatives 1 and 2 have greatest potential airspace conflicts.

4. EVALUATION OF IMPACT ON SURFACE TRANSPORTATION SYSTEM

ONE OF THE MAIN PURPOSES OF AIR transportation is to save travel time. Thus, convenient ground transportation access to local airports and heliports is an important metric in the evaluation of alternatives. For this study, the evaluation of airport and heliport accessibility is measured by using two components: 1) off-airport access which consists of the location of an airport relative to the population base and 2) on-airport access which consists of the existing hourly roadway capacity and the forecasted 2025 peak hour vehicle trips on airport access roads. For example, one reason for examining the need for potential heliports in Alternative 2 involves the lack of air transportation facilities in various parts of the State, which creates lower levels of air travel convenience.

Off-Airport Accessibility

In the National Plan of Integrated Airport Systems (NPIAS) and in other previous aviation system planning efforts, the Federal Aviation Administration (FAA) has endorsed a service area driving time concept for general aviation airport access. This concept asserts that typically, general aviation airports have service areas extending as far as convenient drive times for their users. Normally, this convenient access has been tied to a 30 minute driving time. In areas where this is not feasible (such as high traffic urban areas), some flexibility was allowed for defining the driving time criteria. For airline airport access, a 60 minute driving time has been endorsed.

For this study, airport locational standards were developed in response to the goals and objectives of the study pertaining to air transportation accessibility. These goals and objectives translated the need for commercial service and general aviation airport availability into driving times from population centers:

- Location of an Airport Reference Code C-II or Larger airport (business jet capable) within 30 minutes driving time of all significant population centers of more than 25,000.
- Location of an Airport Reference Code B-I or larger airport (capable of accommodating a majority of general aviation propellor aircraft) within 30 minutes driving time for cities over 2,500 population.
- Location of airline service within 60 minutes driving time for all Delaware residents.

These goals may not be met by any one alternative, but the measure of performance would favor the alternative that best met the goal.

Method of Analysis

The most readily available means of access to all system airports is by automobile. To analytically compare accessibility of system airports, automobile driving time and service area

population were two factors considered. In essence, this portion of the analysis was aimed at determining the “convenience” factor associated with each system airport and the area that it serves. To compare the locational accessibility of system airports, a four-step evaluation process was utilized.

For the general aviation analysis, the first step was to determine a general 30 minute driving time service area around each system airport. The second step was to estimate the population within each of these areas for later scoring. The third step involved the assignment of scores to each airport in each alternative, while the fourth step was the adjustment of scores, based upon the type of airport classification.

Assumptions used in this analysis included the following:

- The airport service area is defined as all areas surrounding the airport within a 30 minute driving time.
- Distances assumed for the 30 minute driving time service area included:
 - 27 miles for divided highways
 - 22 miles for two-lane State highways
 - 18 miles for local and county two-lane roads
- The populations of municipalities are evenly distributed within their boundaries. Although this statement is rarely true, it is made to simplify the methodology.
- Even though some conceptual airport service areas extend into neighboring states only Delaware populations were considered. This was considered the most effective means of assuring a state airport system that met the needs of Delaware’s population.

In estimating service area populations, the 30 minute driving times from each system airport were estimated at points along the major highway network which radiate from each airport. These points were connected to create a perimeter around each airport which represents a theoretical service area. No attempt was made to establish mutually exclusive service areas for system plan airports. Therefore, some municipalities are located within the service area of several airports. Table 6-6 presents the estimated service area population for each system airport.

Figure 6-7 presents a graphic illustration of driving time radii from each system airport for Alternative 2 (which includes all possible service areas for all alternatives). Figure 6-8 shows just Alternative 3 driving time radii for the four system airports. Figure 6-9 shows the 60 minute driving time accessibility for airline service for residents of the State. Including New Castle Airport as an airline service point leaves no significant gaps in airline service coverage of the State. For general aviation airports, Alternative 2 provides extensive coverage of service area populations, however, there are significant gaps in Alternative 3 coverage. For Alternative 3, there are a number of population centers outside the 30 minute driving time areas. As such, Alternative 3 does not meet the aviation access goals of the study.

The populations associated with each service area include:

Table 6-6 - Estimated Service Area Population	
Airport	Service Area Population
Chandelle Estates	173,600
Chorman Airport	189,900
Delaware Airpark	193,100
DelDOT Helistop	173,600
Civil Air Terminal	173,600
Jenkins Airport	173,600
Laurel Airport	101,300
New Castle Airport	505,000
Smyrna Airport	232,200
Summit Airport	296,800
Sussex County Airport	153,300

In developing scores for the service area accessibility and convenience, two factors were considered: service area populations and airport roles. The service area population was scored on a graduated scale as follows:

- 0 - 50,000 +1 Score
- 50,001 - 100,000 +2 Score
- 100,001 - 200,000 +3 Score
- 200,001 - 400,000 +4 Score
- Over 400,000 +5 Score

These scores were tempered by the consideration of the projected role of a system airport. For example, a turf runway airport is limited both in the type of aircraft that can use the facility and in the number and types of airport users. As the size and role of the airport increase, so does the population of potential users. With this in mind, the population scores were adjusted based upon the projected airport role within each alternative using the following factors:

- ARC: C-II or larger 1.00 multiplier
- ARC: B-I or larger 0.75 multiplier
- Less than ARC: B-I 0.50 multiplier

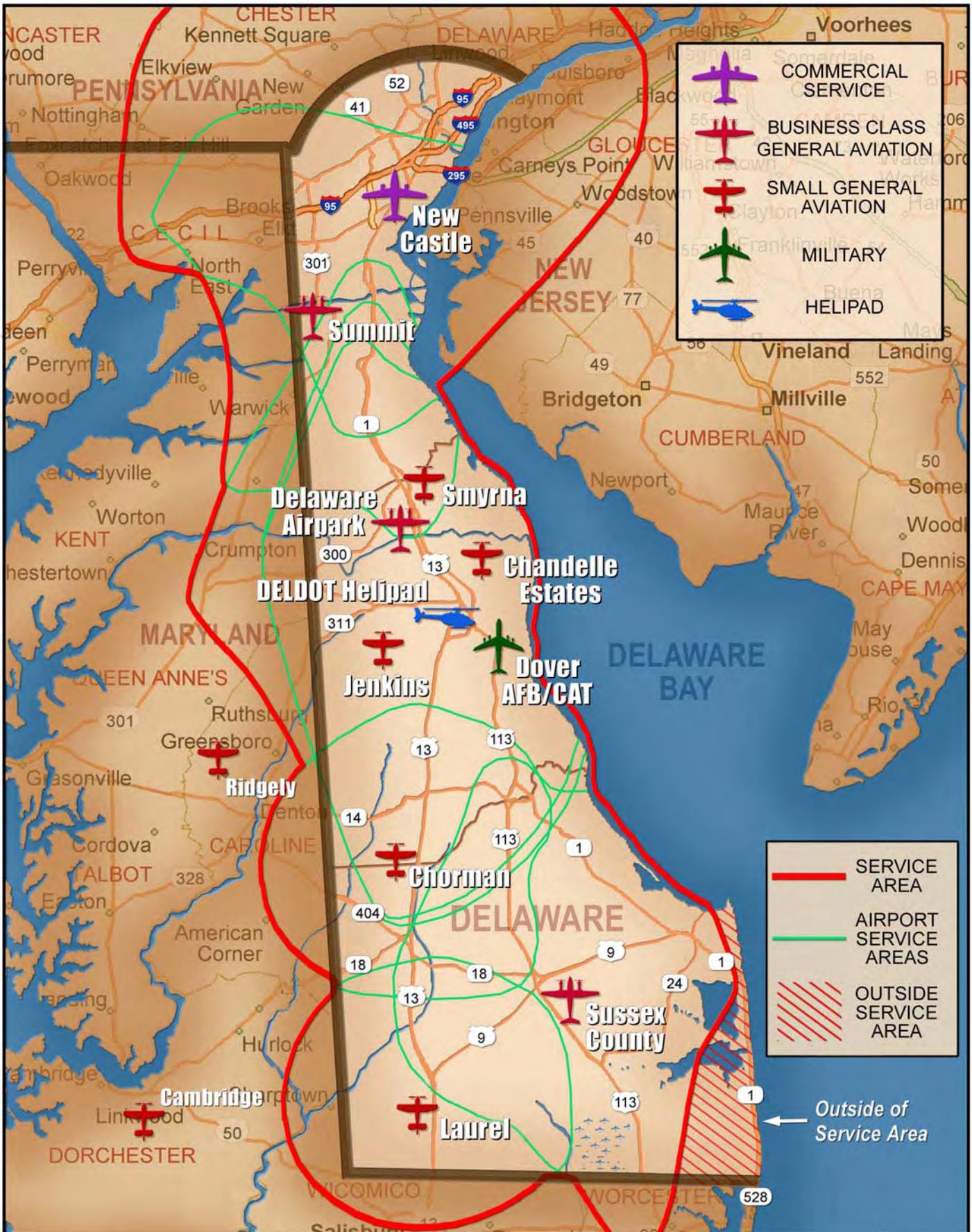
Thus, Chandelle Estates, an ARC A-I Airport that scored a +3 with respect to service area population, would have an adjusted score of +1.5 when the multiplier was applied ($3 * 0.50 = 1.5$).

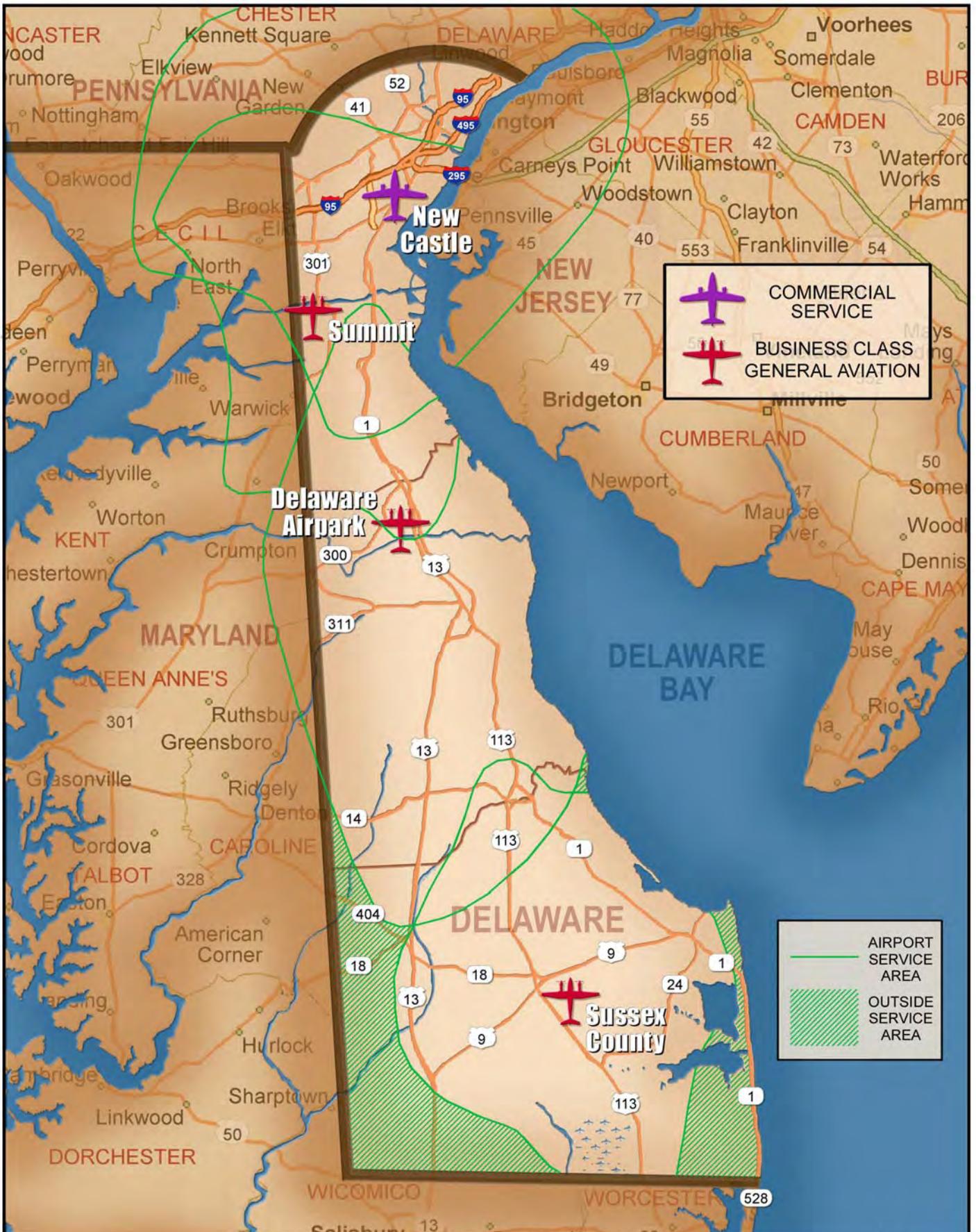
This process of calculating access convenience values favors properly sized airports that are near population concentrations and is consistent with the goals and objectives of the this study.

Table 6-8 presented at the end of this section shows the results of the location accessibility of system airports.

On-Airport Accessibility

On-airport access in the State features highways of varying capacities and demand loadings. Future peak hour vehicle traffic generated from airport operations are shown in Table 6-7. In addition, the existing minimum hourly capacities are compared with the future traffic levels to get a surplus or deficit of airport access capacity for each of the alternatives. From a demand/capacity standpoint, there are no anticipated shortfalls or constraints. If improvements are undertaken, they will probably be for improved convenience or operational efficiency rather than for capacity reasons.





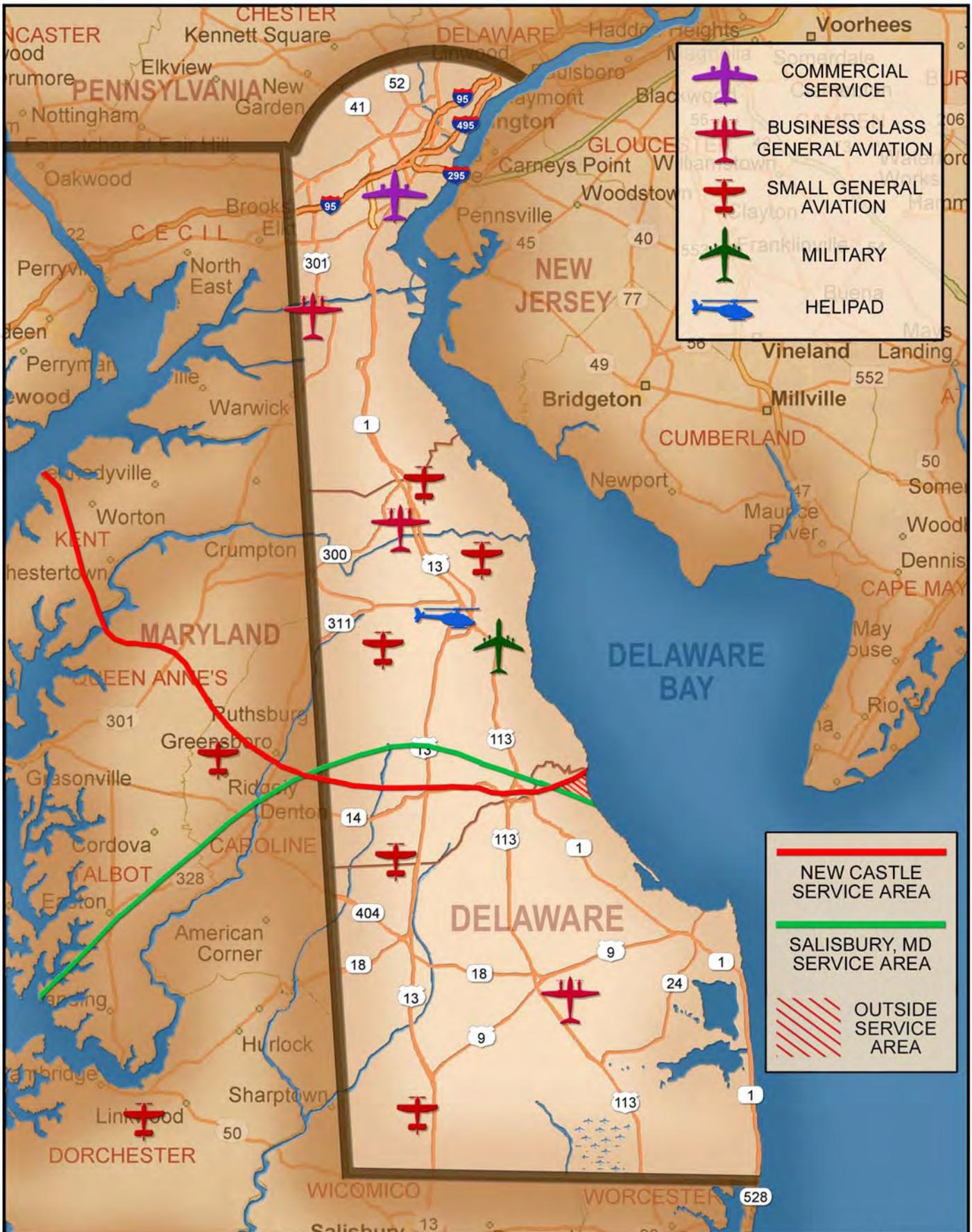


Table 6-7 - Surface Access Capabilities, by Alternative

Alternative/Airport	Access Road	2025 Peak hour Vehicle Trips ¹	Existing Hourly Roadway Capacity ²	2025 Surplus or (Deficit)
ALTERNATIVE 1				
Chandelle Estates	Route 9	16	200	184
Chorman Airport	Nine Foot Road	54	200	146
Delaware Airpark	State Route 42	66	200	134
DelDOT Helistop	Bay Road	1	400	399
Civil Air Terminal	Horsepond Road	132	400	268
Jenkins Airport	Westville Road	7	200	193
Laurel Airport	State Route 24	26	200	174
New Castle Airport	US 13, State Routes 273, 58, & 202	226	1,000	774
Smyrna Airport	State Route 6	7	200	193
Summit Airport	US 301	125	400	275
Sussex County Airport	Airport Road, S Railroad Ave	110	400	290
TOTAL FOR ALT. 1		770	3,800	3,030
ALTERNATIVE 2				
Chandelle Estates	Route 9	16	200	184
Chorman Airport	Nine Foot Road	54	200	146
Delaware Airpark	State Route 42	66	200	134
DelDOT Helistop	Bay Road	1	400	399
Civil Air Terminal	Horsepond Road	165	400	235
Jenkins Airport	Westville Road	7	200	193
Laurel Airport	State Route 24	26	200	174
New Castle Airport	US 13, State Routes 273, 58, & 202	226	1,000	774
Smyrna Airport	State Route 6	7	200	193
Summit Airport	US 301	125	400	275

Table 6-7 - Surface Access Capabilities, by Alternative				
Alternative/Airport	Access Road	2025 Peak hour Vehicle Trips ¹	Existing Hourly Roadway Capacity ²	2025 Surplus or (Deficit)
Sussex County Airport	Airport Road, S Railroad Ave	110	400	290
New Heliports(s)		2	200	198
TOTAL FOR ALT. 2		805	4,000	3,195
ALTERNATIVE 3				
Delaware Airpark	State Route 42	110	200	90
DelDOT Helistop	Bay Road	1	400	399
New Castle Airport	US 13, State Routes 273, 58, & 202	226	1,000	774
Summit Airport	US 301	127	400	273
Sussex County Airport	Airport Road, S Railroad Ave	146	400	254
TOTAL FOR ALT. 3		610	2,400	1,790

¹ Methodology described in Chapter 4: 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.

² Estimated minimum capacity of 200 hourly vehicles for airport ingress and egress turn lanes

Method of Analysis

To score an airport, the different levels of the surplus capacity were used. Airports with less surplus capacity were scored lower than those with a higher percent of surplus capacity. Scores for the evaluation criteria were summed so that each airport could have a possible range of scores from zero (0) to positive five (+5). The following rating factors were used:

Surplus Capacity	Rating Factor
● 1% - 20%	1
● 21% - 40%	2
● 41% - 60%	3
● 61% - 80%	4
● 81% - 99%	5

Accessibility Findings

In determining an overall ranking of alternatives, the results of the “off airport access” and the “on airport access” evaluation were considered. The relative importance of these two criteria

were considered equal for system planning purposes. The scores for each airport are presented in matrix form in Table 6-8. The overall score for each airport is shown by taking the average of the two scores. For example, the average for Delaware Airpark in Alternative 2 was calculated as follows:

$$\frac{\text{Off airport access score plus On airport access}}{\text{Divided by 2}}$$

or:

$$\frac{(2.3) + (4)}{2} = 3.2$$

When this process was followed for all airports in each of the alternatives, the following scores were recorded:

- Alternative 2 First: 40.2
- Alternative 1 Second: 37.5
- Alternative 3 Third: 17.6

This scoring makes intuitive sense because with fewer airports air travel will be less convenient.

Table 6-8 - Accessibility - Matrix Scores for Alternatives									
Airport	Alternative 1			Alternative 2			Alternative 3		
	Access Off Airport	Access On Airport	Total Score	Access Off Airport	Access On Airport	Total Score	Access Off Airport	Access On Airport	Total Score
Chandelle Estates	1.5	5.0	3.3	1.5	5.0	3.3	--	--	--
Chorman Airport	2.3	4.0	3.2	2.3	4.0	3.2	--	--	--
Delaware Airpark	2.3	4.0	3.2	2.3	4.0	3.2	2.3	4.0	3.2
DelDOT Helistop	1.5	5.0	3.3	1.5	5.0	3.3	1.5	5.0	3.3
Civil Air Terminal	3.0	4.0	3.5	3.0	3.0	3.0	--	--	--
Jenkins Airport	1.5	5.0	3.3	1.5	5.0	3.3	--	--	--
Laurel Airport	1.5	5.0	3.3	1.5	5.0	3.3	--	--	--
New Castle Airport	5.0	4.0	4.5	5.0	4.0	4.5	5.0	4.0	4.5
Smyrna Airport	2.0	5.0	3.5	2.0	5.0	3.5	--	--	--
Summit Airport	3.0	4.0	3.5	3.0	4.0	3.5	3.0	4.0	3.5
Sussex County Airport	2.3	4.0	3.2	2.3	4.0	3.2	2.3	4.0	3.2
New Heliports	--	--	--	1.5	5.0	3.3	--	--	--
TOTALS	25.9	49.0	37.8	27.4	53.0	40.3	14.1	21.0	17.7

5. EVALUATION OF ENVIRONMENTAL COMPATIBILITY

THIS SECTION EXAMINES THE RELATIONSHIP BETWEEN THE airports in each alternative and their surrounding environment. The alternative that minimizes adverse impacts will be ranked higher than the alternatives that have the most adverse impacts. The evaluation criteria used to evaluate environmental compatibility dealt with two primary factors: noise impact and impact on the natural environment. The remaining portions of this section discuss how the evaluation was performed and what findings were produced.

Evaluation of Noise Impact

Noise impact is defined as airport generated noise affecting human uses of land in the immediate vicinity of an airport. Probably the greatest deterrent to airport construction and expansion comes from residents who object to perceived noise generated as a result of aircraft operations. However, noise impact is a product of two distinct factors. The first is the proximity of the noise-sensitive areas to an airport. The second is the amount of actual noise generated by aircraft using the airport.

Thus, a low-activity airport may have very little perceived noise impact even though it is surrounded by residential housing. Conversely, a highly active airport may have perceived noise problems, even if it is immediately surrounded by agricultural land uses. Because of these differences, a methodology for rating each alternative was developed that took into account both factors.

Method of Analysis

For this analysis, no actual noise mapping was performed. That process is undertaken for site-specific planning efforts such as airport master plans and Federal Aviation Regulations Part 150 Noise studies. At the system planning level of detail, a rating scale was developed that took into account both the surrounding land uses and the airport operational activity. Criteria to evaluate the impact of noise on land uses and their relative ratings were selected as follows:

- Residential (-5)
- Recreational (-4)
- Commercial (-3)
- Industrial (-2)
- Agricultural (-1)

The rank order for these land uses represent the typical greatest-to-least impact associated with airport-generated noise. In the analysis, the off-airport areas on all 4 sides of the airport immediately adjacent to the runways were examined. The greatest possible negative score would be a -20 for an airport with predominant residential land use on each of 4 sides, while the lowest possible score would be a -4 for an airport located in a farmland area. Land use categories were identified during on-site inspections along with input from DelDOT, which together were used to refine the airport

noise impact scoring system.

The next step was to select criteria to measure the relative intensity of noise impact on the surrounding airport area. An obvious general measure would involve the level of operations conducted at a system airport. The rating system used in this analysis employed a relative scale that varied by airport classification. In this regard, the following rating factors were applied:

- ARC: C-II or larger 1.00 multiplier
- ARC: B-I or larger 0.50 multiplier
- Less than ARC: B-I 0.25 multiplier

These factors were multiplied by the operational activity at the respective airports expressed as a percentage of the busiest airport, by classification:

$$\frac{X}{X_1} \quad \text{Where } X = \text{total operations and} \\ X_1 \text{ equals operations at the busiest} \\ \text{airport of the same classification}$$

To combine both sides of the evaluation equation, (noise sensitive areas around an airport and airport operational activity) the noise sensitive ratings for each airport were multiplied by the activity rating factor (between 0 and 1.0) to get the overall noise impact rating. For example, Delaware Airpark in Alternative 2 was scored as follows:

$$\frac{(\text{Land Use Rating}) \times (\text{Utility Airport Class factor}) \times (\text{Year 2025 total operations})}{\text{Total operations at the busiest airport of the same class}}$$

or

$$\frac{(-12) \times (0.5) \times (46,400)}{84,300} = -3.3$$

Because of the method of scoring, it was possible to exceed a negative five (-5) at some of the State's busiest airports. This is reasonable since there are such great disparities in activity between system airports. Table 6-9 presents the noise impact scores for each system airport, by alternative.

Impact on the Environment

The impact of airport development on the natural environment is contrasted with the noise impact in that noise impact is dependent upon human use of land around an airport. Impact to the natural environment, on the other hand, occurs as a result of construction impacts such as wetland encroachment, surface drainage or absorption alteration, wildlife or waterfowl habitat encroachment, or air quality degradation. Included in this evaluation was an analysis of the proximity of an airport to historic districts or areas of natural or scenic beauty. In this regard, the development of an airport should be planned so as not to conflict with the appreciation of these resources.

(0).¹ Word associations for the numerical rating values are as follows:

<i>Evaluation Criterion</i>	<i>Numerical Rating</i>	
	-5	0
Noise Impact	Highest Impact	Lowest Impact
Impact on Natural Environment	Greatest Potential	Least Potential

The scores for each airport in each alternative are summarized and presented in Table 6-9. A summary matrix was used so that all airports in each of the alternatives could be readily compared. The overall score for each airport was calculated using a weighted average. The method of calculating the weighted mean employed the following steps:

- Multiply the score of each criterion by its associated weight.
- Sum the products of the first step.
- Divide the answer in the second step by the sum of the weights.

Again, using Delaware Airpark in Alternative 2 as an example, the following score was derived:

$$\frac{(\text{Noise Score times Weight of 2}) \text{ plus } (\text{Environment Score times Weight of 1})}{2 \text{ plus } 1}$$

or

$$\frac{(-3.3 \times 2) + (-2 \times 1)}{3} = -2.9$$

By numerically evaluating system airports with two major environmental compatibility criteria, all airports scored in the range of negative 14.3 to zero (0). The highest negative scores occurred at airports where noise problems have already been documented. The fact that a score of -14.3 was recorded indicates the relative difference in activity as compared to other lower activity airports in that class.

AIRPORT	Alternative 1			Alternative 2			Alternative 3		
	Noise	Environ.	TOTAL	Noise	Environ.	TOTAL	Noise	Environ.	TOTAL
Chandelle Estates	-1.3	0.0	-0.9	-1.3	-2.0	-1.5	--	--	--
Chorman Airport	-0.9	0.0	-0.6	-0.9	-1.0	-0.9	--	--	--
Delaware Airpark	-3.3	0.0	-2.2	-3.3	-2.0	-2.9	-5.3	-1.0	-3.0
DeIDOT Helistop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Civil Air Terminal*	--	--	--	--	--	--	--	--	--
Jenkins Airport	-0.5	0.0	-0.3	-0.5	-3.0	-1.3	--	--	--

¹ Both Summit Airport and New Castle Airport exceeded these numerical ratings for potential noise impact.

Table 6-9 - Environmental Compatibility Evaluation									
AIRPORT	Alternative 1			Alternative 2			Alternative 3		
	Noise	Environ.	TOTAL	Noise	Environ.	TOTAL	Noise	Environ.	TOTAL
Laurel Airport	-1.0	0.0	-0.7	-1.0	-1.0	-1.0	--	--	--
New Castle Airport	-20.0	-1.0	-13.7	-20.0	-3.0	-14.3	-20.0	-2.0	-14.0
Smyrna Airport	-0.7	0.0	-0.5	-0.7	-1.0	-0.8	--	--	--
Summit Airport	-9.0	-1.0	-6.3	-9.0	-3.0	-7.0	-9.0	-3.0	-7.0
Sussex County Airport	-5.0	0.0	-3.3	-4.8	-1.0	-3.5	-7.2	-1.0	-5.1
New Heliport(s)	--	--	--	-0.1	0.0	-0.1	--	--	--
TOTALS	-41.7	-2.0	-28.5	-41.6	-17.0	-33.3	-41.5	-7.0	-29.1

* Not included in analysis since the CAT is not an airport. Dover AFB serves as the airside facilities and because of extensive military use is not included in the analysis.

In summation, it will take careful planning and execution to avoid environmental and land use conflicts around airports. Currently, most of the system airports are reasonably compatible with surrounding land uses. This fact is illustrated by the closeness of the scores of “Action” alternatives to the “No Action” Alternative:

- Alternative 1 ranked first: -28.5 Points
- Alternative 3 ranked second: -29.1 Points
- Alternative 2 ranked third: -33.4 Points

Alternative 1 ranked highest due to the fact that no construction would take place in this alternative (by definition). Alternative 3 ranked second since fewer number of airports included in the Alternative tended to concentrate the environmental impacts. The poor ranking of Alternative 2 was caused mainly by the expansion of Sussex Airport and the construction impacts associated with the other airports.

6. EVALUATION OF SYSTEM DEVELOPMENT COSTS

COST ESTIMATES FOR EXPANDING EXISTING SYSTEM AIRPORTS and constructing a new system airport in Delaware are critical to the evaluation of alternative systems. All public-use airports (both publicly owned and privately owned) were included in the cost analysis, since the costs are representative of the deficiencies as they currently exist and the funding required to correct those deficiencies.

Method of Analysis

This analysis was performed in 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 6-10. All unit cost estimates are in constant 2007 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.

In some cases, airport master plan estimates of costs were used in the determination of overall costs (for Delaware Airpark, Summit, and Sussex County). These costs included items that were far more detailed than the system plan estimates. However, relative differences between Alternative 2 and Alternative 3 were incorporated into these detailed master plan costs. Thus, the additional demand placed on Alternative 3 airports by the assumed closure of the privately owned, public-use airports was reflected in the costs. Table 6-11 lists the estimated system development costs for each of the alternatives.

Table 6-10 - Unit Cost Factors			
Capital Cost Descriptor	Unit	Airports for Aircraft Under 12,500 lbs.	Airports for Aircraft Over 12,500 lbs.
Land	Acre	Variable	Variable
Runways/Taxiways:			
New/Extend/Widen	S.Y.	\$75	\$90
Overlay	S.Y.	\$30	\$35
Aircraft Parking Apron:			
General Aviation	S.Y.	\$75	\$90
Overlay	S.Y.	\$30	\$35
Lighting & Approach Aids:			
HIRL	L.F.	\$35	\$35
MIRL	L.F.	\$25	\$25
MITL	L.F.	\$30	\$30
VASI/PLASI/PAPI	Each	\$75,000	\$75,000
MALS	L.S.	\$500,000	\$500,000

Table 6-10 - Unit Cost Factors			
Capital Cost Descriptor	Unit	Airports for Aircraft Under 12,500 lbs.	Airports for Aircraft Over 12,500 lbs.
REIL	Pair	\$40,000	\$40,000
Buildings:			
Airline Terminal	S.F.	---	\$250
GA Terminal	S.F.	\$200	\$200
Conventional Hangar	S.F.	\$60	\$60
T-Hangar	Single Unit	\$45,000	\$45,000
Auto Parking:			
Space, at grade	S.Y.	\$40	\$40
Miscellaneous:			
Rotating Beacon & Tower	L.S.	\$50,000	\$50,000
Lighted Wind Indicator	L.S.	\$5,000	\$5,000

LEGEND:

S.Y. - Square Yards
L.F. - Linear Feet
HIRL - High Intensity Runway Lights
MIRL - Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights
MALS - Medium Intensity Approach Lighting System
REIL - Runway End Identifier Lights
VASI - Visual Approach Slope Indicator
PLASI - Pulsating Light Approach Slope Indicator
PAPI - Precision Approach Path Indicator
GA - General Aviation

L.S. - Lump Sum
S.F. - Square Feet

Table 6-11 - Alternative Development Costs							
Airport	Alternative 1		Alternative 2		Alternative 3		
	Total Costs	Airfield Costs	Landside Costs	Total Costs	Airfield Costs	Landside Costs	Total Costs
Chandelle Estates	\$0	\$0	\$322,500	\$322,500	--	--	--
Chorman Airport	\$0	\$0	\$1,928,000	\$1,928,000	--	--	--
Delaware Airpark	\$0	\$5,095,000	\$9,809,000	\$14,904,000	\$10,170,000	\$13,979,800	\$24,149,800
DelDOT Helistop	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Civil Air Terminal	\$0	\$0	\$1,790,000	\$1,790,000	--	--	--
Jenkins Airport	\$0	\$0	\$235,000	\$235,000	--	--	--

	<u>Dollar Range</u>	<u>Score</u>
●	\$0	0
●	\$1 - \$500,000	-1
●	\$500,001 - \$5,000,000	-2
●	\$5,000,001 - \$15,000,000	-3
●	\$15,000,001 - \$30,000,000	-4
●	Over \$30,000,000	-5

Although a quantitative ranking of alternatives yields a straightforward classification, this does not imply that the least expensive alternative is the most cost effective. In order to make a qualitative judgment regarding the most cost effective alternative, the decision must be weighed by whether or not the goals of the study are met and how important these goals are to implement. There may be tradeoffs between what is ultimately desired and what is financially feasible. For this reason, no qualitative judgments are made at this point in the study. Such judgments will be made later in the study during the selection of a Recommended System Plan, after considering all factors in the analysis of alternatives.

7. SUMMARY AND RANKING OF ALTERNATIVES

FIVE CRITERIA WERE USED TO NUMERICALLY EVALUATE the airports in each aviation system alternative. These criteria were selected because they encompassed statewide concerns that could be quantified and were comprehensive in scope. In addition, issues identified at the beginning of the study were incorporated into the analysis to the extent possible. Scores for each airport with respect to each criteria generally ranged from negative five (-5) for undesirable characteristics to positive five for desirable characteristics. In some cases, those scores were exceeded, but these cases were limited to Summit Airport and New Castle Airport.

The five evaluation criteria are listed below with their ranges of scores, word associations for those scores, and classification by type. Both the facility needs and the access criteria had rankings in the positive range, indicating that even the Do-Nothing Alternative contributes positively to the air transportation system in these areas. Airspace utilization, environmental compatibility, and development costs all carried negative numerical ratings since they, at the best case, are zero or neutral. At this point in the analysis, all of the criteria are assumed to have equal importance. This weighting system, of course, can be changed by DelDOT or the Delaware Aviation Advisory Committee, if desired.

<i>Evaluation Criteria</i>	<i>Numerical Rating</i>		
	-5	0	+5
Facility Needs	---	Inadequate Facilities	Adequate Facilities
Airspace Utilization	Worst Case	Best Case	---
Surface Access	---	Worst Case	Best Case
Environmental Compatibility	Detrimental Impacts	No Impacts	---
Development Costs	Greatest	None	---

To rank the alternatives numerically, a cumulative scoring system was used. The alternative with the least negative cumulative score was ranked highest. Table 6-12 displays the individual airport scores and the cumulative alternative scores. Using the cumulative score rating system, the ranking of each alternative is as follows:

- Alternative 2 19.9 Points
- Alternative 1 17.2 Points
- Alternative 3 -16.0 Points

Alternative 2 ranked highest, followed by Alternative 1. Alternative 1 ranked second due to its assumed \$0 cost and the better environmental scoring of Alternative 1 since no construction impacts were assumed. Alternative 3 ranked last primarily because of its inability to serve demand as well as the other two alternatives.

Table 6-12 -Summary of Alternative Scores

Airport	Alternative 1						Alternative 2						Alternative 3					
	Serve Demand	Airspace	Access	Environ.	Costs	Total	Serve Demand	Airspace	Access	Environ.	Costs	Total	Serve Demand	Airspace	Access	Environ.	Costs	Total
Chandelle Estates	3.0	-2.0	3.3	-0.9	0.0	3.4	5.0	-2.0	3.3	-1.5	-1.0	3.8	--	--	--	--	--	0.0
Chorman Airport	1.5	0.0	3.2	-0.6	0.0	4.1	5.0	-0.8	3.2	-0.9	-2.0	4.5	--	--	--	--	--	0.0
Delaware Airpark	2.0	-2.4	3.2	-2.2	0.0	0.6	5.0	-2.4	3.2	-2.9	-3.0	-0.1	5.0	-1.7	3.2	-3.0	-4.0	-0.5
DelDOT Helistop	4.5	0.0	3.3	0.0	0.0	7.8	5.0	0.0	3.3	0.0	0.0	8.3	5.0	0.0	3.3	0.0	-1.0	7.3
Civil Air Terminal	3.0	-3.2	3.5	--	0.0	3.3	5.0	-3.2	3.0	--	-2.0	2.8	--	--	--	--	--	0.0
Jenkins Airport	3.0	-1.5	3.3	-0.3	0.0	4.5	5.0	-1.5	3.3	-1.3	-1.0	4.5	--	--	--	--	--	0.0
Laurel Airport	3.5	-0.4	3.3	-0.7	0.0	5.7	5.0	-0.4	3.3	-1.0	-2.0	4.9	--	--	--	--	--	0.0
New Castle Airport	2.0	-7.0	4.5	-13.7	0.0	-14.2	5.0	-7.0	4.5	-14.3	-5.0	-16.8	5.0	-4.0	4.5	-14.0	-5.0	-13.5
Smyrna Airport	3.0	-0.5	3.5	-0.5	0.0	5.5	5.0	-0.5	3.5	-0.8	-1.0	6.2	--	--	--	--	--	0.0
Summit Airport	2.0	-2.5	3.5	-6.3	0.0	-3.3	5.0	-2.5	3.5	-7.0	-2.0	-3.0	5.0	-3.9	3.5	-7.0	-5.0	-7.4
Sussex County Airport	2.0	-2.1	3.2	-3.3	0.0	-0.2	5.0	-2.1	3.2	-3.5	-5.0	-2.4	5.0	-1.0	3.2	-5.1	-4.0	-1.9
New Heliports	--	--	--	--	--	0.0	5.0	0.0	3.3	-0.1	-1.0	7.2	--	--	--	--	--	0.0
Totals	29.5	-21.6	37.8	-28.5	0.0	17.2	60.0	-22.4	40.6	-33.3	-25.0	19.9	25.0	-10.6	17.7	-29.1	-19.0	-16.0

8. CENTRAL DELAWARE SUBSYSTEM ANALYSES

AS A PART OF THE EVALUATION, THE existing mini-system in central Delaware that includes the use of Delaware Airpark and Dover Air Force Base's Civil Air Terminal (along with the privately owned, public-use airports in Kent County) was examined. In the previous system plan, the two airports were planned to work together to accommodate the entire spectrum of aviation demand in central Delaware. That is, Delaware Airpark was planned to accommodate aircraft up to and including large turboprop aircraft such as Beechcraft King Air 200's. The CAT at Dover AFB would then accommodate aircraft larger than these turboprops such as business jet aircraft. However, after 9/11/2001, Dover AFB and the CAT were closed to civilian joint-use traffic for six months. During that time, the mini-system was "broken" and did not work according to the plan. Thus, new thinking was needed to determine if alternatives to the previous mini-system roles were needed.

The evaluation used surveys of current and past users of the Civil Air Terminal to determine if the three-day prior permission requirement, flight manifests, indemnification agreement, etc., implemented after 9/11/01 have impacted potential use of the facility. Responses to these surveys, in turn, were used to identify the need for alternative air access in Central Delaware. Steps in the process included the following:

- Survey of Civil Air Terminal users.
- Estimates of potential critical aircraft demand for each facility
- Confirmation of previous central Delaware general aviation site selection study findings
- Analysis of potential expansion at Delaware Airpark to accommodate more corporate aviation and its potential impact

This analysis will be reviewed by the DAAC to ensure that Delaware stakeholders have input to the results of the analysis.

8.1 Survey of Civil Air Terminal Users

A survey of Civil Air Terminal (CAT) users was undertaken to determine the level of satisfaction associated with the current restrictions on access to Dover AFB. These restrictions have been in place since the CAT was reopened for civilian use in March of 2002:

- 72 Hour Prior Permission for Landing
- Provision of Flight Manifests for All Inbound Flights
- Indemnification Agreement With DRBA and Dover AFB
- Limited Services at CAT

Added to these restrictions are landing fees ranging from \$25 to \$30. The survey asked users if these restrictions at the CAT reduced their use of the facility. A second question was asked concerning their ability to use general aviation facilities with 5,500 feet of runway. While some

larger operators may not be able to use a runway with only 5,500 feet, operators who are able to use this runway length can give their preferences concerning the existing restrictions for using the CAT versus an unrestricted general aviation airport. It is assumed that Delaware Airpark would serve as the nearby general aviation alternative to the CAT. Figure 6-10 presents a copy of the survey form used in this analysis.

Survey Response

A total of 84 surveys were mailed to the corporations that used the Civil Air Terminal during 2007. The survey was sent out on January 8, 2008 and responses were received by January 29, 2008. Of the 84 surveys sent, 5 were returned undeliverable, and 26 were completed and returned. This created an overall response rate of 32.9 percent. The survey responses represent over 143 aircraft from businesses in 22 cities in 10 states. The states included North Carolina, Michigan, Pennsylvania, Delaware, Ohio, Virginia, Connecticut, Tennessee, Missouri, and Indiana. The following questions were asked:

1. *Do any of the following restrictions reduce your use of the Dover, DE Civil Air Terminal At Dover Air Force Base:*
 - *72 Hour Prior Permission*
 - *Providing Flight Manifests of Passengers*
 - *\$25 to \$30 Landing Fee*
 - *Indemnification Agreement (Hold Harmless)*
 - *Limited Service*

The purpose of this question was to determine how the different restrictions affected the use of the Civil Air Terminal. A total of 26 firms responded to this question.

	<u>Yes</u>	<u>No</u>	<u>Percent Yes</u>
<i>72 Hour Prior Permission</i>	14	12	53.8%
<i>Providing Flight Manifests of Passengers</i>	8	18	30.7%
<i>\$25 to \$30 Landing Fee</i>	3	23	11.5%
<i>Indemnification Agreement (Hold Harmless)</i>	6	19	24%
<i>Limited Service</i>	11	15	42.3%

The 72 hour prior permission had the biggest impact for users with 53.8 percent saying that this restriction reduced their use of the Civil Air Terminal. Limited service was next with 42.3 percent, followed by providing flight manifests of passengers (30.7 percent), and the indemnification agreement (24 percent). The landing fee affected the least amount of users with only 11.5 percent saying that the fee reduced their use.

2. *If a nearby General Aviation airport with 5,500 feet of runway were available with none of the above restrictions, would that be preferable to the civil air terminal for your company's aviation use?*

The purpose of this question was to determine how important the use of the Civil Air Terminal was to users, and if they would consider using another airport if it was located nearby. Seven users (28 percent) said that they would not use an alternative airport, while 18 users (72 percent) said that they would use an alternative airport.

3. *Comments?*

A total of 14 respondents wrote suggestions or comments regarding the use of the Civil Air Terminal or an alternative General Aviation Airport.

Of the seven users who said they would not use an alternative airport, four submitted the following comments:

- “CAT works hard to meet our needs.”
- “Location of CAT is what makes it our first choice... Ben Clendaniel is a very helpful representative for CAT and has made the PPR program manageable”
- “Depends on where our customers want to go.”
- “Most of our trips, which are few, are race team related and they prefer your airport.”

Of the 18 users who said they would use an alternative airport, ten wrote comments regarding the new airport. Most of the comments were for the needs that the alternative airport would have to meet such as an ILS, unobstructed 5,500 ft of runway length, de-icer for winter use, competitive pricing, and adequate parking. Other comments pertained to the restrictions at the Civil Air Terminal, and how the use of an alternative airport would depend on airport conditions and proximity.

Dover, DE Civil Air Terminal Use Study
Corporate Aviation User Questionnaire

Company Information

Name _____ Phone _____

Address _____

City _____ State _____ ZIP _____

Aircraft Type _____

Company Flight Preferences

1. Do any of the following restrictions reduce your use of the Dover, DE Civil Air Terminal at Dover Air Force Base:
- | | | |
|--|-----------|----------|
| a) 72 hour prior permission | _____ Yes | _____ No |
| b) Providing flight manifests of passengers | _____ Yes | _____ No |
| c) \$25 to \$30 landing fee | _____ Yes | _____ No |
| d) Indemnification agreement (hold harmless) | _____ Yes | _____ No |
| e) Limited services | _____ Yes | _____ No |
2. If a nearby General Aviation airport with 5,500 feet of runway were available with none of the above restrictions, would that be preferable to the Civil Air Terminal for your company's aviation use?
- _____ Yes _____ No

3. Comments: _____

Please Fax Your Response to 502-535-5314 or Mail to:

R.A. Wiedemann & Associates, Inc.
P.O. Box 621
Georgetown, KY 40324

Thank You for Your Response!

8.2 Critical Aircraft Demand

Forecasts of critical aircraft demand were taken from existing studies of both the CAT and Delaware Airpark. By definition, the critical aircraft is the most demanding aircraft expected to use the facility with 500 itinerant operations or more each year. Current planning documents indicate that the Airport Reference Code (ARC) for Delaware Airpark is B-II, while Dover AFB has an ARC of E-VI.

By way of definition, an ARC consists of both an aircraft approach category and an airplane design group. These are explained as follows:

- **Aircraft Approach Category:** A grouping of aircraft based on 1.3 times their stall speed in the landing configuration at the certificated maximum flap setting and maximum landing weight at standard atmospheric conditions. The categories are as follows:
 - Category A: Speed less than 91 knots.
 - Category B: Speed 91 knots or more but less than 121 knots.
 - Category C: Speed 121 knots or more but less than 141 knots.
 - Category D: Speed 141 knots or more but less than 166 knots.
 - Category E: Speed 166 knots or more.

- **Airplane Design Group:** A grouping of airplanes based on wingspan or tail height. Where an airplane is in two categories, the most demanding category should be used. The groups are as follows:
 - Group I: Up to but not including 49 feet (15 m) wingspan or tail height up to but not including 20 feet.
 - Group II: 49 feet (15 m) up to but not including 79 feet (24 m) wingspan or tail height from 20 up to but not including 30 feet.
 - Group III: 79 feet (24 m) up to but not including 118 feet (36 m) wingspan or tail height from 30 up to but not including 45 feet.
 - Group IV: 118 feet (36 m) up to but not including 171 feet (52 m) wingspan or tail height from 45 up to but not including 60 feet.
 - Group V: 171 feet (52 m) up to but not including 214 feet (65 m) wingspan or tail height from 60 up to but not including 66 feet.
 - Group VI: 214 feet (65 m) up to but not including 262 feet (80 m) wingspan or tail height from 66 up to but not including 80 feet.

Thus, planned roles for Delaware Airpark and the Civil Air Terminal could be translated into the types of aircraft that each facility could accommodate. For Delaware Airpark, a B-II designation means aircraft with approach speeds under 121 knots and wingspans of up to 79 feet can be accommodated on a regular basis. The Beechcraft Super King Air B200/B350 or similar aircraft is at the high end of the B-II category.

For Dover AFB, there is really no limit to the size of aircraft that can use the military base. However, the CAT ramp is currently limited by weight loads and aircraft wingspan. Until a new taxiway is constructed, aircraft larger than the B-737 Boeing Business Jet (BBJ) cannot taxi past the terminal building due to its close proximity to the existing taxiway. The current ramp is designed to accommodate aircraft weighing up to 70,000 pounds on a regular basis. This strength is adequate for normal use by aircraft such as the Gulfstream III, VI, and V. Occasional use by the BBJ can be accommodated with the current ramp strength. For the future, there may be a desire to park civilian air cargo aircraft at the CAT. This would require the construction of a new taxiway and the significant strengthening of a portion of the existing ramp. These aircraft are primarily B-747's under military contract. Even if no other civilian aircraft were permitted to use Dover AFB, these aircraft would still have access due to their function as cargo carriers for the Air Force.

Should the military close Dover AFB to civilian use, displaced aircraft that regularly use the facility would include business jets and other corporate aircraft. The largest aircraft size to regularly use the facility would likely be the Gulfstream III, VI, or V. The largest of these aircraft has a wingspan of 78 feet and a length of 83 feet. The ARC associated with these aircraft is C-II. Thus, if Delaware Airpark were to accommodate displaced aircraft, it would have to be expanded to meet C-II design standards. Typically, this would include a runway of roughly 5,500 feet by 75 feet.

8.3 Confirmation of Previous Central Delaware Site Selection Study

During the Delaware Aviation Advisory Committee meeting process, concern was raised about the ability of Delaware Airpark to accommodate future demand in central Delaware. From these discussions, a request was made to reconfirm the original airport site selection findings that resulted in the selection of Delaware Airpark. In particular, the question was raised that there may be a better site available with easy expansion capability. To address these concerns, this section revisited the previous site selection process and worked to confirm the results. In particular, each of the fourteen potential airport sites that were originally identified in the site selection study were re-examined via on-site inspections and aerial photography. The purpose was to determine if the sites had experienced any significant changes, such as new development or other land use changes since the time of the original study (1996).

Previous Studies

The 1986 Central Delaware Site Selection & Master Plan Study considered a number of sites within Kent County for the development of a publicly owned, general aviation airport. Delaware Airpark was the selected site, and in 1990, the State was unsuccessful in its attempt to purchase the facility. Then in 1996 another site selection analysis was conducted to reinvestigate the validity of the original site selection study and came up with 14 potential sites for consideration. Delaware Airpark was once again selected as the preferred site. In August of 2000, the State was able to purchase the facility.

The goal of the 1996 study was to develop a comprehensive plan for the establishment of a

safe and modern general aviation airport in Central Delaware. It was designed to address current and future general aviation demand and to promote the growth and economic vitality of the Central Delaware area. The 1996 Study served as the primary guidance and support used by the State in moving forward with the purchase of Delaware Airpark. The results of that study are re-examined in the following subsections of this report.

Original Site Selection Study Results

Fourteen potential sites were examined by the 1996 Site Selection Study. These sites included: 1) Smyrna Airport, 2) Site, near Blackiston, 3) Site North of Hartly, 4) Delaware Airpark, 5) Site off Almshouse Road, 6) Site along Mud Mill Road in west-central Kent County, 7) Henderson Airport, 8 & 9) Sites located along State Route 12 in southwest Kent County, 10) Site north of Milford, 11) Site north of Harrington, 12 & 13) Sites southwestern Kent County west of Harrington, and 14) Chorman Airfield. Figure 6-11 presents a map showing the approximate location of each of the 14 preliminary sites.

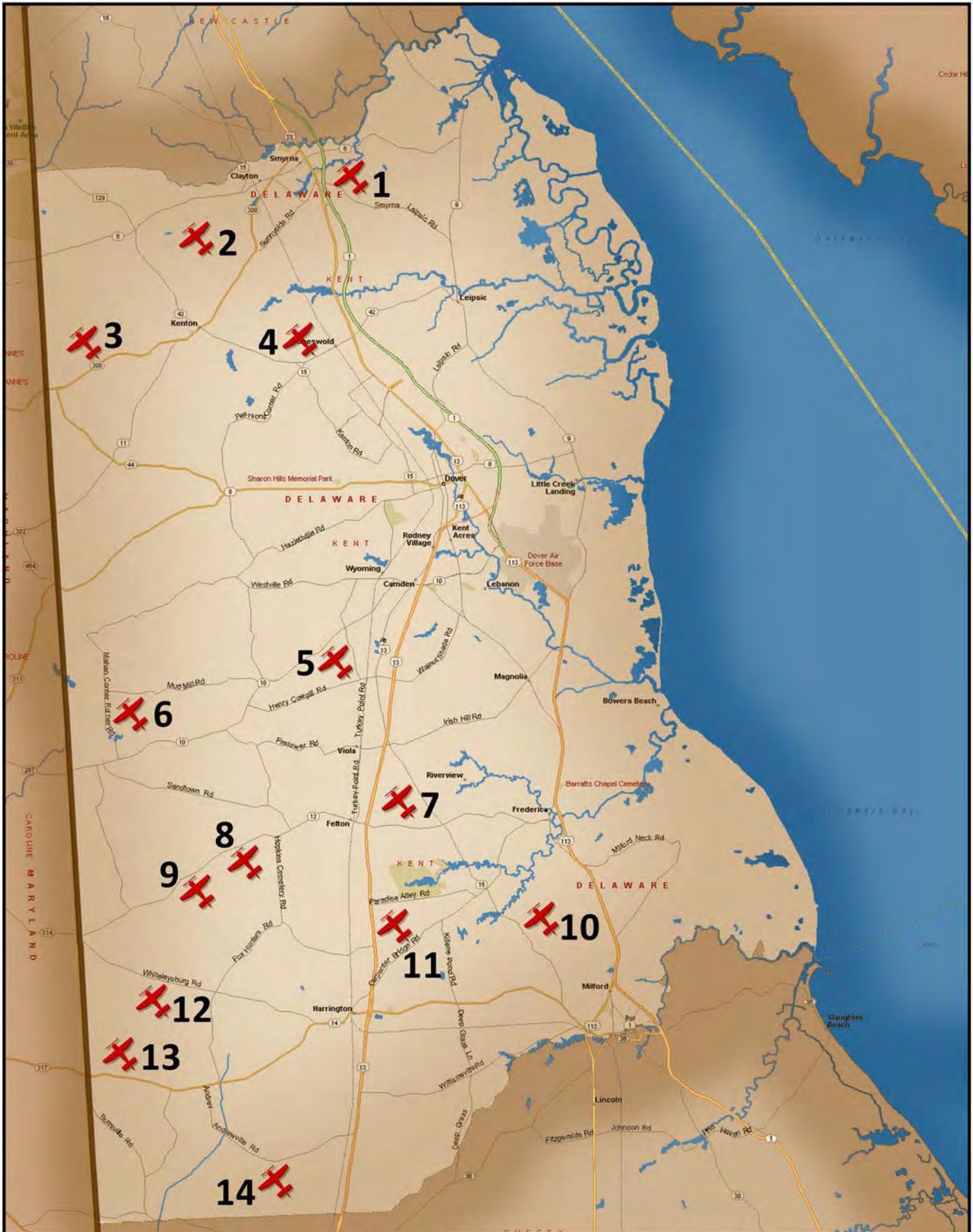
These potential airport locations were identified, using United States Geological Survey (USGS) maps combined with on-site observation of potential areas. Requirements for the sites included the ability to accommodate up to 5,500 feet of runway length. The ideal site was relatively flat, removed from residential housing, and did not encroach any wetlands. Four of the sites were existing airports (one of which has since closed).

Evaluation Criteria

The fourteen potential sites were evaluated in an initial or preliminary screening process. This initial process addressed several key criteria important in airport siting. The goal of the initial process was to quickly eliminate undesirable locations and reduce the number of potential airport sites to a manageable quantity. Each of the fourteen potential sites were evaluated based on the following criteria:

- Access
- Existing Land Use/Land Use Compatibility
- Wetlands and Floodplains
- Expansion Potential
- Aeronautical Factors

A visual inspection of the sites was then conducted to verify and refine the analysis, and to identify other attributes and constraints such as roads, adjacent development, obstructions, and topography which were not illustrated on any of the published sources.



Updated Site Evaluations

The 14 original sites were revisited during the week of August 6-10, 2007 to assess changes in their condition and environs since that 1996 study. Based on these site investigations, a number of developments have changed the condition and feasibility of several of the sites.

Site Descriptions And Updated Evaluations

A brief description of the fourteen sites is presented in the following paragraphs. In addition, Appendix A presents photos of the various airport sites that show recent developments.

Site 1:

Site 1 is Smyrna Airport, an existing airport located just east of the city of Smyrna along State Route 6. The site is located in northern-most Kent County, which limits the convenience of the airport, particularly to users that may reside in southern Kent County. Updated information on the site indicates that the expansion of the site is limited due to residential and commercial development to the west, and existing wetlands and waterways to the east. New housing construction to the north of the airport serve to increase the area's sensitivity to noise generated by aircraft.

Site 2:

Site 2 is located to the east of Blackiston along Underwoods Corner Road. The site is north of the Blackiston State Wildlife Area and is currently used as farmland. There are several rural residences on the site, however, there is no large population center nearby. Clayton is located roughly 1.5 miles to the northeast. Similar to Site 1, this site is located near the northern border of Kent County, limiting the convenience of the airport for users in southern Kent County. Updated information indicates that a housing development has been constructed on the northeast end of the site at the intersection of Alley Corner Road and Underwoods Corner Road. As a result, this site is no longer viable for airport development.

Site 3:

Site 3 is located south of the Blackiston Wildlife Area and north of Hartly. The site is located along Lion Hope Road and traverses both wooded and unwooded terrain. Its location near Maryland and northern Kent County has the drawback of being remote from potential users of the facility, thereby decreasing its overall convenience. Updated information on the site indicates that there are houses along the north and south ends of the potential runway location making it unusable for use as an airport facility.

Site 4:

Site 4 is Delaware Airpark, an airport located just west of Cheswold along State Route 42. The site is located near the city of Dover, Kent County's largest population center. Updated information on the site indicates that expansion to the north and west is available. The State has purchased land in these areas and expansion of the airport is ongoing.

Site 5:

Site 5 is located west of Dover and just south of Jenkins Airport near Almshouse Road. The site is bounded by Westville Road to the north and Thicket Road to the south. Updated information on the site indicates that a housing development has been built in the middle of the potential runway location, making the site no longer viable for an airport.

Site 6:

Site 6 is located in west-central Kent County along Mud Mill Road. This site, by virtue of its remoteness avoids residential development. It also is located on land clear of woods. Lack of convenience to users is one of the drawbacks of this site. Updated information on the site indicates that three houses have been built on the potential runway location and several other houses have been constructed on the eastern end of the potential runway on Pony Track Road, removing the site from further consideration.

Site 7:

Site 7 is Henderson Airport, an existing airport located along State Route 15 east of Felton. The location of a house on property adjacent to the airport has limited any expansion unless the house is relocated. Updated information on the site indicates that a block of houses has been built on Yoeman's Tale Lane which is on the northwest edge of the potential runway. This development makes Site 7 no longer suitable for airport development.

Sites 8 & 9:

Sites 8 and 9 are located along State Route 12 in southwest Kent County. Both sites are relatively flat and expandable, with some tree cover and wetlands. Site 8 was eliminated in the previous study due to the location of a large tower just north of the site. Updated information on the sites indicate that Site 8 has stayed relatively the same while new houses have been built along Site 9's potential runway location.

Site 10:

Site 10 is located just north of Milford off of State Route 15. The site is bounded by Bluejay Lane, Crickett Hollow Lane, Bowman Road, and State Highway 15 and would serve southern Kent County. The site is somewhat distant to Dover. Another drawback to the site is the location of tall radio towers roughly two miles to the southwest, directly on the potential runway centerline. Updated information on the site indicates that there have been no major changes since the last site selection analysis.

Site 11:

Site 11 is located north of Harrington along US Highway 13. It is bounded to the north by Paradise Alley Road, to the south by Winkler Road, and to the east by wetlands. The site is just south of Killens Pond State Park, and because of its location within southern Kent County, it is not as convenient to the large population centers as some other sites to the north. The site is not expandable and cannot accommodate its runway safety areas without road relocation on one runway end or the other. Updated information on the site indicates that very little new development has

occurred since the previous study.

Sites 12 & 13:

Sites 12 and 13 are located in southwestern Kent County in remote areas west of Harrington. Site 12 would be accessible from Whiteleysburg Road, while Site 13 would be accessible from State Route 14. Both of these sites are near the Delaware/Maryland state line, and as such rank very low in terms of convenience to users. Updated information on the sites indicate that residential units have been built on the northern half of Site 12's potential runway and residential houses have been built on the west end of Site 13's potential runway. In addition, a radio tower is located to the east of the potential runway at Site 13.

Site 14:

Site 14 is Chorman Airfield, an existing airport located north of Greenwood. The site is just inside Kent County at the southern-most border. As an existing airport, the site has merit from its recognized use as an aviation facility. However, the site is limited to perhaps 4,500 feet of runway length in its ultimate configuration unless Andrewville Road is closed or relocated. Also, the fact that it is remote to central Delaware is a negative point for the site. Updated information on the site indicates that there is no major change since the last site selection analysis.

Updated Site Selection Summary

From the 1996 site selection process, a composite matrix was developed that ranked the final three sites with respect to the evaluation criteria described earlier (access, land use, wetlands, expansion potential, aeronautical). From that evaluation, shown in Table 6-13, the top three sites were #4 - Delaware Airpark, #5 - Almshouse Road, and #7 - Henderson Airport. From the updated analysis, both sites 5 and 7 are no longer viable as potential airport sites.

Table 6-13 - Alternative Analysis Site Composite Matrix						
SITE	Accessibility	Land Use	Environmental	Aeronautical	Costs	Totals
#4 - Delaware Airpark	9.0	9.0	6.0	5.0	8.0	37.0
#5 - Almshouse Road	8.0	7.0	5.0	8.0	4.0	32.0
#7 - Henderson Airport	6.0	8.0	6.0	6.0	2.0	28.0

From the scoring in Table 6-13, the rank order of sites is as follows:

- Delaware Airpark 1st
- Almshouse Road 2nd
- Henderson Airport 3rd

The most recent site analysis indicated that site #10 - north Milford - had not changed since the 1996 study. It's primary drawbacks included tall radio towers located near the potential site, its inaccessibility to Dover, and the fact that it was not already an airport. Delaware Airpark was

shown to be superior due to its location near Dover, its expansion capability, and its use as an existing airport.

Taken in total, Delaware Airpark still remains the best choice for a public-use airport of any of the other sites studied in Kent County. Given the continued property development within Kent County, most of the other original sites are no longer developable as airports. Thus, the original site selection is confirmed in this reexamination.

8.4 Potential Expansion of Delaware Airpark

If Dover AFB is closed to public aviation use, demand that formerly used the CAT must be shifted to other nearby airports. Only those airports with runways long enough and strong enough can accommodate this displaced demand. Thus, the question of whether or not Delaware Airpark could be expanded to meet this demand shift should be addressed. For this analysis, expansion of Delaware Airpark would be to meet current CAT critical aircraft, not Dover AFB critical aircraft. That is, the critical aircraft considered in this analysis is the C-II category which includes aircraft such as the Gulfstream III, VI, and V. The typical size requirements of a general aviation C-II airport for large aircraft greater than 60,000 pounds and stage lengths of up to 750 miles include runways with 5,500 feet in length by 75 feet in width. This runway length and width would also support 100 percent of large aircraft under 60,000 pounds at 60 percent of their useful loads.

Examination of the location and constraints of the existing airport site indicate that a 5,500 foot runway could physically fit without creating road relocations or other such disruptions. Costs to expand the airport have been conservatively estimated at more than \$24 million. The ability to fit the runway length at that location is only one part of the potential expansion process. Before such an expansion could take place, a revised master plan would have to be developed and a full environmental assessment would have to be undertaken. That environmental process would examine all of the issues related to noise, land use, wetlands, cultural resources, etc., associated with any construction in the area. Public hearings are required as a part of this process, gathering the input of the general public on this issue.

Until the need is presented, there will be little movement to examine the potential expansion of Delaware Airpark. That is, the current system, although not ideal, will suffice for the near term. If Dover AFB eliminates public use by civilian aircraft, alternatives should then be considered, including the possible expansion of Delaware Airpark.

8.5 Findings & Recommendations for Central Delaware Subsystem

Findings and recommendations of the central Delaware subsystem analysis can be summarized to include the following major points:

- CAT users responded that restrictions imposed after 9/11/01 have reduced their use of the facility.
 - The 72-hour prior permission requirement has had the largest impact, reducing the use of 54 percent of respondents.
 - The limited services available at the CAT was second, reducing the use of 42 percent of respondents.
 - The requirement to provide flight manifests of passengers was third, reducing the use of 31 percent of respondents.
 - The indemnification agreement and landing fees were the fourth and fifth ranking factors in reducing use of the CAT.
- A total of 72 percent of respondents would prefer a full service, well equipped general aviation airport with 5,500 feet of runway. This translates into 1,010 operations from business jet aircraft by the year 2025.
- The Airport Reference Code (ARC) for Delaware Airpark is B-II, while Dover AFB has an ARC of E-VI.
 - The B-II designation means aircraft such as the Beechcraft Super King Air B200/B350 with approach speeds under 121 knots and wingspans of up to 79 feet can be accommodated on a regular basis.
 - For the CAT, the ramp strength of 70,000 pounds is adequate for normal use by aircraft such as the Gulfstream III, VI, and V.
- This study validated the selection of Delaware Airpark as the preferred site for a publicly owned general aviation airport in central Delaware.
 - Updated site visits showed that new residential and commercial development has eliminated most of the original airport sites suggested in the 1996 Central Delaware Airport Site Selection Study.
- If Dover AFB canceled joint-use operations for civilian aircraft, Delaware Airpark could be expanded to accommodate some portion of the business jet aircraft using the facility.
- Minimum costs to expand Delaware Airpark's runway to 5,500 feet would exceed \$24 million, assuming it met all environmental and funding requirements.

Until public-use of Dover AFB is threatened with cancellation, the current mini-system that allocates large propeller aircraft to Delaware Airpark and large business jet activity to the Civil Air Terminal is adequate. However, the survey indicated that demand for general aviation facilities services has been generated by the imposition of restrictions at the CAT by the Air Force. In this regard, 72 percent of respondents indicated a preference to use a 5,500 foot runway at a local general aviation airport. Translating this number into forecast demand, 1,010 operations from business jet type aircraft would transfer to Delaware Airpark by the end of the planning period if those facilities

were expanded and available. Thus, even though the current system is adequate, planning for an expanded Delaware Airpark resulting from Dover AFB operational restrictions is justified.

9. HELIPORT SUBSYSTEM

THE USE OF HELIPORTS IN DELAWARE IS GROWING. The current system includes one public-use heliport and 14 private-use heliports or helipads (Figure 6-12). Appendix B presents aerial photography of each heliport in the Delaware system along with its facility description. Many have special functions including those for State Police, hospitals, Dover Downs, and private companies or residences. These sites were visited and inspected during the week of August 6-10, 2007. During that time, it was found that some of the sites were no longer in use, and that other sites were in use that were not published in the FAA's Form 5010 database. Four heliports that were no longer in use were taken off the list:

- Barcroft Company
- Delmar Ford
- Strawbridge Christiana Mall
- Wilmington County Club

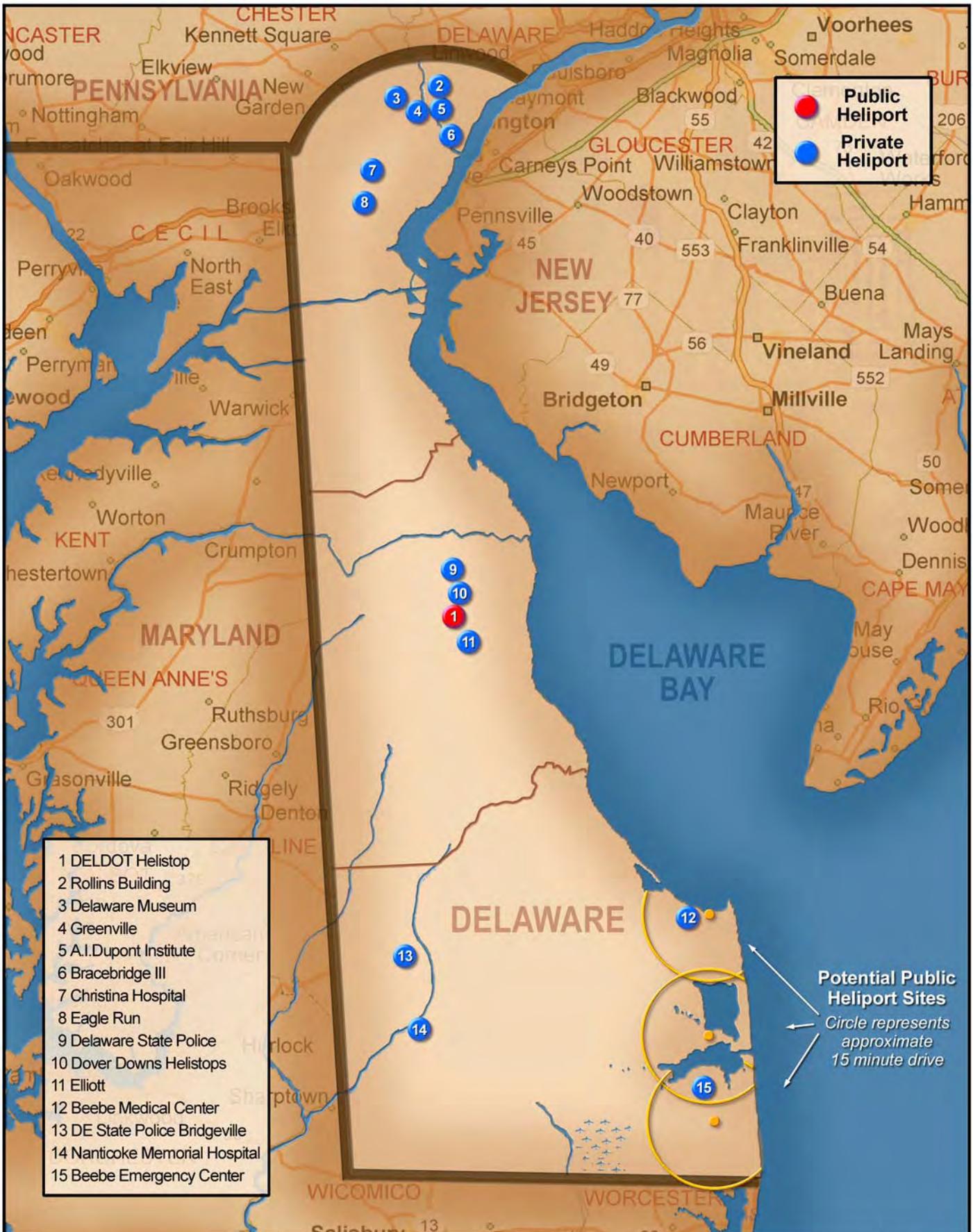
Four other heliports were found that were not on the FAA 5010 list but will be added in the near future. These heliports are:

- Delaware State Police (Bridgeville)
- BeeBe Hospital
- BeeBe Medical Center Millville
- Nanticoke Health Services

Figure 6-12 shows where these facilities are located throughout the State. The two main clusters of heliports are around New Castle and Dover. None of the heliport sites offers Avgas or Jet A fuel sales. If a helicopter needs refueling it must do so at an airport.

- Seven Heliports Are Located Around the City of New Castle.
- Four Heliports Are Located Around the City of Dover.
- Four Heliports Are Located in Sussex County

Of Sussex County's heliports, two are located near the coast and two are located inland. The two coastal facilities are hospital heliports which are closed to public use. Thus, there are no existing public heliports located around the coastal areas of Sussex County that can be used for tourists or inland commuters.



9.1 Coastal Heliport Sites

Of particular concern in this system plan is the lack of heliport coverage in coastal Delaware. In this regard, it is reported that private helicopter owners use non-designated landing sites to pick up or drop off passengers. These passengers are mostly second-home owners and part-time residents that visit the beach areas periodically. To ensure safety and increase air access to the coastal communities of Delaware, the heliport subsystem analysis recommended the identification or development of up to three coastal heliport sites. No specific locations were given, but general areas were designated on the map (Figure 6-12). These general locations are based on the need for convenient air access to Lewes, Long Neck, and South Bethany and Fenwick Island.

Because of their ability to land and take off vertically, helicopters afford their owners more convenience than aircraft or automobiles, particularly for shorter trips. System planning criteria indicates the desirability of an airport within 30 minutes of driving time of the population. However, for heliports, a smaller 15 minute driving time standard is used, reflecting the need for greater convenience. In Figure 6-12, the coastal circles represent 15 minutes driving time radii from the center locations. The three circles represent the areas that are the best locations to locate heliports to serve area populations within 15 minute driving times. Locating heliports in these areas would be sufficient to accommodate helicopter demand in coastal Delaware.

A prototypical heliport for these sites would include a 60 foot by 60 foot asphalt pad, with clear approaches from one or more sides (Figure 6-13). While sites in the coastal area do not have to be this elaborate, the FAA guidance provides the ideal or best case layout for facilities. The approach slope of eight-to-one needs to be free of penetrating obstructions. A wind indicator at the site is important to give helicopter pilots visual reference

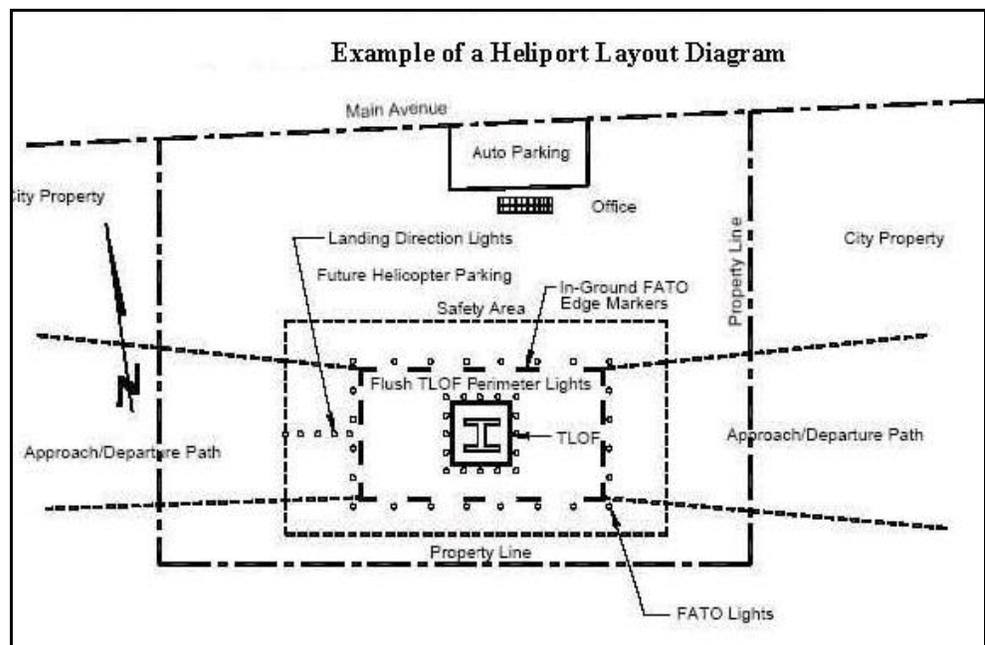


Figure 6-13 - Prototypical Heliport Layout (Source: FAA AC 150/5390-2B "Heliport Design")

to wind direction and strength.

9.2 Activity & Costs

The heliport subsystem analysis was aimed at making recommendations for the proposed new heliports in coastal Sussex County. For the most part, all of the other existing heliports in the State do not have activity issues and are anticipated to function well under their current ownership and operation. There are two times during the year that there is an influx of helicopter activity in Dover. During race weekends (Thursday through Sunday), helicopter activity picks up for the race teams accessing Dover Downs. During this time it is not uncommon for private helicopters to land at the State Police Helipad to drop off and pick up passengers. During race weekend, more helipads are spray painted in the grass outside of Dover Downs. These pads are only used for the race weekends. No changes to the current practices are warranted.

For Sussex County, new heliports could attract as many as 150 operations per year - 450 total for all three sites. In addition to increasing convenience and safety, these heliports could also serve as evacuation points for public emergencies or homeland security. They would provide Delaware State Police with additional landing sites for medevac transfer or other law enforcement activity.

The costs to develop one of these sites could range from \$30,000 for a paved unlighted facility with no additional facilities, to more than \$200,000, depending upon land costs. For the heliports in Alternative 2, an average cost of \$60,000 was used - \$180,000 for all three. Thus, only minimal to mid-range facilities would be considered. These would include a paved landing pad, perimeter fencing, wind indicator, and a minimum of five auto parking spaces. Ideally, these landing pads could be located on publicly owned property that already has space for the helipad.

10. PRELIMINARY RECOMMENDATION

Once the overall recommendation of Alternative 2 was made to the Delaware Aviation Advisory Committee, discussion and review from the DAAC resulted in a slightly altered Recommended Plan. These changes revolved around better geographic coverage for the provision of airport and heliport facilities. In particular, resolutions passed by the DAAC included the following:

- **Concerning Eastern Sussex County:** “Explore air service locations to ensure adequate coverage of eastern Sussex County, using any mix of airport and heliports needed to ensure basic coverage.”
- **Concerning Heliport Coverage:** “Include a Wilmington public-use heliport location as a recommendation for study/action.”
- **Concerning Central Delaware Subsystem:** “Keep the current roles for Delaware Airpark and the CAT with contingency plans to preserve expansion options at Delaware Airpark if the Air Force reduces or eliminates civil use of Dover AFB. The CAT will handle all large business jet activity while Delaware Airpark will serve propeller and turboprop aircraft.”

Changes to the system plan resulting from these resolutions are actually related. Impacts to the System Plan are discussed in the following paragraphs.

10.1 Public-Use Airport for Eastern Sussex County

One reason for recommending public use coastal airports in Sussex County is to fill the gap in missing airport service area coverage. As such, several members of the DAAC asked about the feasibility of purchasing or establishing a public-use airport to serve the area. West’s Airport in Roxana (a privately owned, private-use airport) was suggested as a possible location since it represented an existing airport that might have potential for conversion to public use. It was noted that the old Rehoboth Airport that served the area (now converted to other uses) was very busy in the summer months. Noting the new pattern of year-round living in the coastal area, there may be more aviation demand in the area than during its former seasonal periods.

Several negative factors that would work against the location of a public-use airport in coastal Sussex County were identified by some members of the DAAC. These included:

- The increasing number of residential developments in the area. Generally, residential land uses do not mix well in close proximity with airport land uses.
- West’s Airport already has neighbors that register noise complaints with the County.
- A public-use airport near Sussex County Airport may compete for clientele - diluting revenues for both airports.
- Local support for a publicly owned, public-use airport in coastal Sussex County

- would be needed prior to any sponsorship or development movement.
- No support for the recommendation of a new airport in coastal Sussex County in the previous State Aviation System Plan (1998) had been generated over the last decade.

However, despite these issues, it was unanimously decided that Sussex County would have a “last chance” to include a new coastal airport in their long range planning.

Thus, a recommendation added to the plan included the following:

- A public-use airport in coastal Delaware should be included in the Recommended Plan. The System Plan supports the concept of general aviation air access to that unserved portion of Delaware.

This recommendation was based on the possible conversion of West’s Airport to a public-use facility. This recommendation is open-ended, in that public use designation can come from either a private owner or a public owner. Also, if West’s Airport is selected, it could serve in lieu of a third public-use heliport in the Bethany Beach area, since helicopter traffic could be directed to that airport landing site. A revised map showing the new recommendation is presented in Figure 6-14.

Development of West’s Airport for public-use could take the form of public or private ownership. For the private owner to make West’s a public-use airport, very little in the form of investment would be needed. However, if a municipal government were to purchase the facility and develop it as a public-use airport, significant costs would be required - perhaps as much as \$20 million. Thus, depending upon the type of facilities desired (turf versus paved), the cost of a public-use airport in coastal Sussex County could become a major factor in the feasibility analysis.

10.2 Heliport Subsystem Revised Recommendations

The recommendation of a public-use airport in coastal Sussex County (West’s) automatically provides a location for potential helicopter operations. It would also relieve the coastal area of needing three heliports to provide coverage of 15 minutes driving time to area citizens. Rather, only two new heliport locations, along with one public-use airport in the area would be needed.

The heliport subsystem recommendations as presented prior to the DAAC review did not address the gap in public-use heliport facility availability in New Castle County. Although there are a number of private-use heliports in the Wilmington area, there are no public-use facilities. This gap was addressed by the DAAC by recommending that the criteria of geographic coverage for heliports be changed from its previous definitional standards. In the original analysis, heliports were located to assist in emergency services and in geographic coverage of airport-related gaps - specifically those areas in coastal Sussex County that were more than 30 minutes driving time from a public-use airport. Changes to these standards were suggested by the DAAC in the form of expanded coverage of public-use heliports in Delaware.

In this regard, a recommendation was added to the plan:

- At least one public-use heliport should be located in each Delaware county.

There is currently a public-use heliport in Kent County. Recommended development of two public-use heliports in Sussex County left New Castle County without the coverage of a public-use heliport. By locating this heliport facility somewhere in the Downtown Wilmington area, it could be assumed that during busy traffic times, a 15 minute drive time to New Castle Airport would be exceeded. Figure 6-14 shows the recommended plan of public-use aviation facilities in Delaware, including the Wilmington public-use heliport.

10.3 Revised Recommendation

The above analysis, including DAAC input, provides the framework for a preliminary recommendation. Alternative 2 was ranked highest among the three alternatives evaluated. Alternative 2 contains all of the existing airports plus the addition of potential new heliports. The net effect of this preliminary recommendation should be to guide the DelDOT planning actions in the following manner:

- Every reasonable effort should be made to preserve the existing system of airports and expand them where possible.
- Effort should be undertaken to preserve the Joint-Use Agreement with Dover AFB and to expand the freedom of access to the Civil Air Terminal.
- Options should be preserved to expand Delaware Airpark if Dover AFB cancels civilian use of the facility.
- A recommended public-use airport in coastal Sussex County remains in the State Aviation System Plan in the event local sponsors are found to carry this recommendation forward. This airport could be privately owned and if established, would take the place of one public-use heliport in that area.
- Heliport access to all three counties including Downtown Wilmington and coastal Delaware is needed and should be included in long range planning efforts.

In effect, the evaluation of alternatives found that the privately owned, public-use airports are a valuable asset to the State's aviation system and should be preserved if possible. Without them, air transportation accessibility and convenience is reduced, placing a greater burden on the publicly owned facilities. The preliminary recommendation of Alternative 2 provides a means of accommodating future demand through a partnership of public and private airport sponsors. Using this balanced approach, the air transportation system in Delaware can be protected and expanded for the long term.

The preliminary recommendation of Alternative 2 does not mean that a new airport in Sussex County or that new heliports are automatically to become a reality. Rather, it opens discussion on the local level for the provision of such air access. Generally, a number of conditions must exist

prior to moving the development process forward, including:

- Local interest in the project
- Local sponsorship and support
- Specific planning, environmental, and economic studies
- Availability of funding

If these conditions do not develop, then additional public-use airports or heliport landing areas are not likely to develop.

Appendix A: Site Selection Analysis

Site One: Smyrna Airport



Site One Smyrna Airport

Location Site One is located just east of the city of Smyrna along State Route 6 in the northern-most portion of Kent County

Description The Site is an existing airport with a 2,600 foot by 125 foot runway. The location in northern Kent County limits the convenience of the airport, particularly to users that may reside in southern Kent County. Updated information on the site indicates that the expansion of the site is limited due to residential and commercial development to the west and wetlands and waterways to the east. New housing to the north of the airport will increase the area's sensitivity to noise generated by aircraft.

Lat/Long 39 18' 18.78"N, 75 35' 11.66"W

Site Two



Site Two New Airport Site

Location Site Two is located to the east of Blackiston along Underwoods Corner Road. The site is north of the Blackiston State Wildlife Area near the northern border of Kent County.

Description There are several rural residences on the site, however, there are no large population centers nearby. Clayton is located roughly 1.5 miles to the northeast of the site. Similar to Site One, this site is located near the northern border of Kent County, limiting the convenience of the airport for users in southern Kent County. Updated information indicates that a housing development has been constructed on the northeast end of the site at the intersection of Alley Corner Road and Underwoods Corner Road. As a result, this site is no longer viable for airport development.

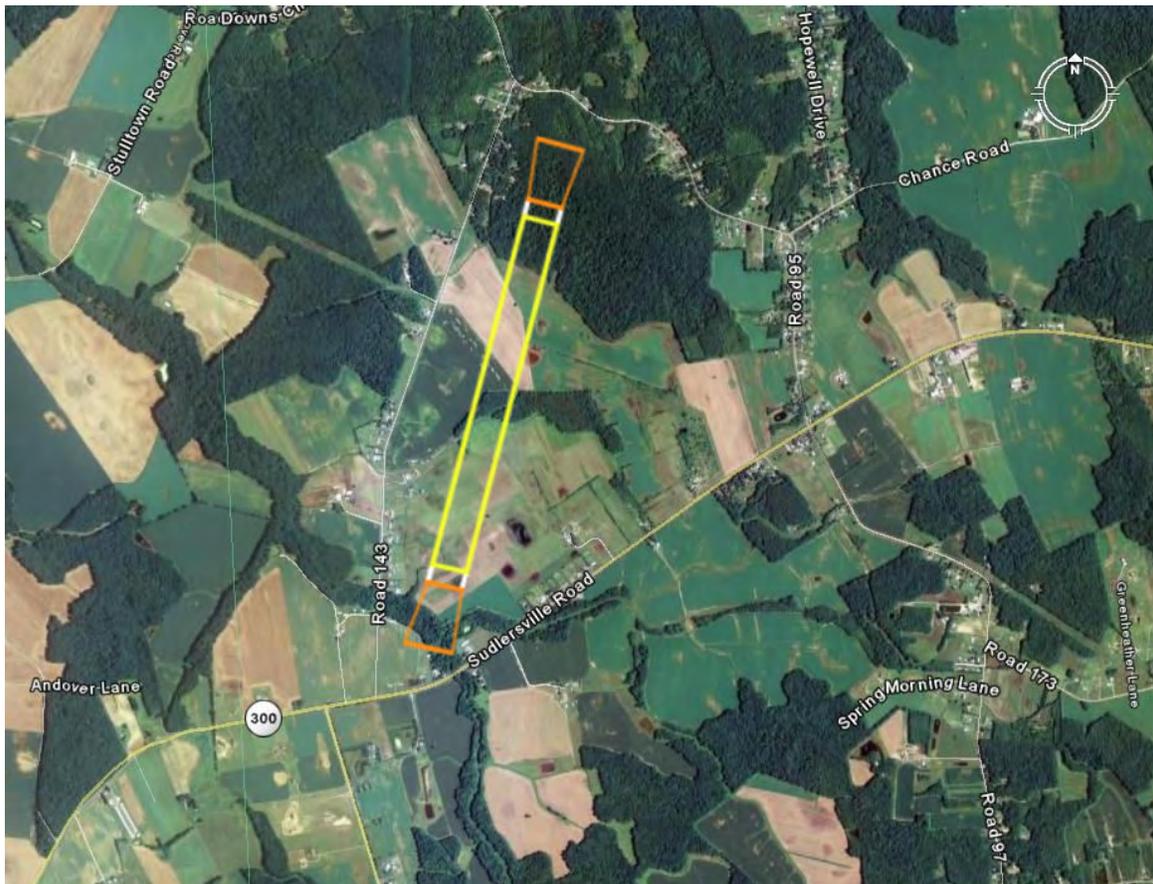
Lat/Long 39 15' 58.21"N, 75 39' 27.46"W

Site Two



Southwest end of the potential runway

Site Three



Site Three New Airport Site

Location Site Three is located south of the Blackiston Wildlife Area and north of Hartly along Lion Hope Road in northern Kent County.

Description The site traverses both wetland-wooded and unwooded terrain. Its location near Maryland and northern Kent County has the drawback of being remote from potential users of the facility, thereby decreasing its overall convenience. Updated information on the site indicates that there are houses along the north and south ends of the potential runway location making it more difficult to convert to an airport facility.

Lat/Long 39 13' 08.54"N, 75 44' 20.18"W

Site Three



The southwest end of the potential runway facing northwest



The southwest end of the potential runway facing east

Site Four: Delaware Airpark



Site Four Delaware Airpark

Location Site Four is located west of Cheswold along State Route 42 near the city of Dover.

Description Site Four is Delaware Airpark, an existing airport with a 3,582 foot runway. The site is located near the city of Dover, Kent County's largest population center, making the site very convenient for users. Updated information on the site indicates that expansion to the north and west is available. The State has purchased land in these areas and development of a replacement runway at the airport is planned.

Lat/Long 39 13' 05.72"N, 75 35' 47.73"W

Site Five



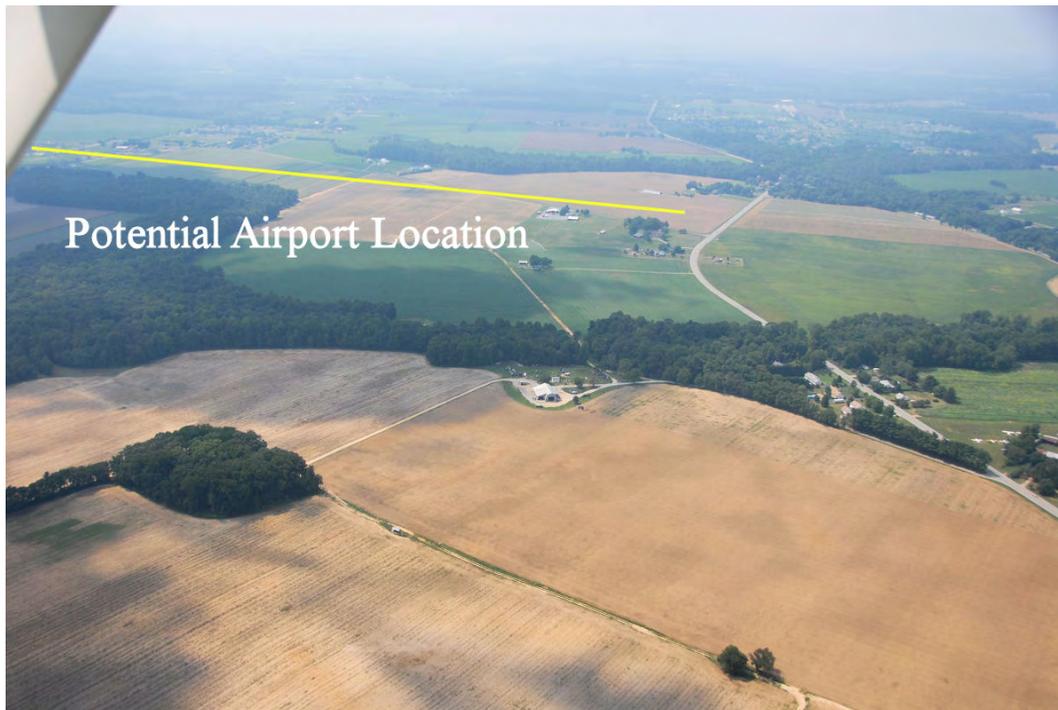
Site Five New Airport Site

Location Site Five is located west of Dover and just south of Jenkins Airport off Almshouse Road

Description The site is bounded by Westville Road to the north and Thicket Road to the south. Updated information on the site indicates that a housing development has been built in the middle of the potential runway location, making the site no longer viable for an airport.

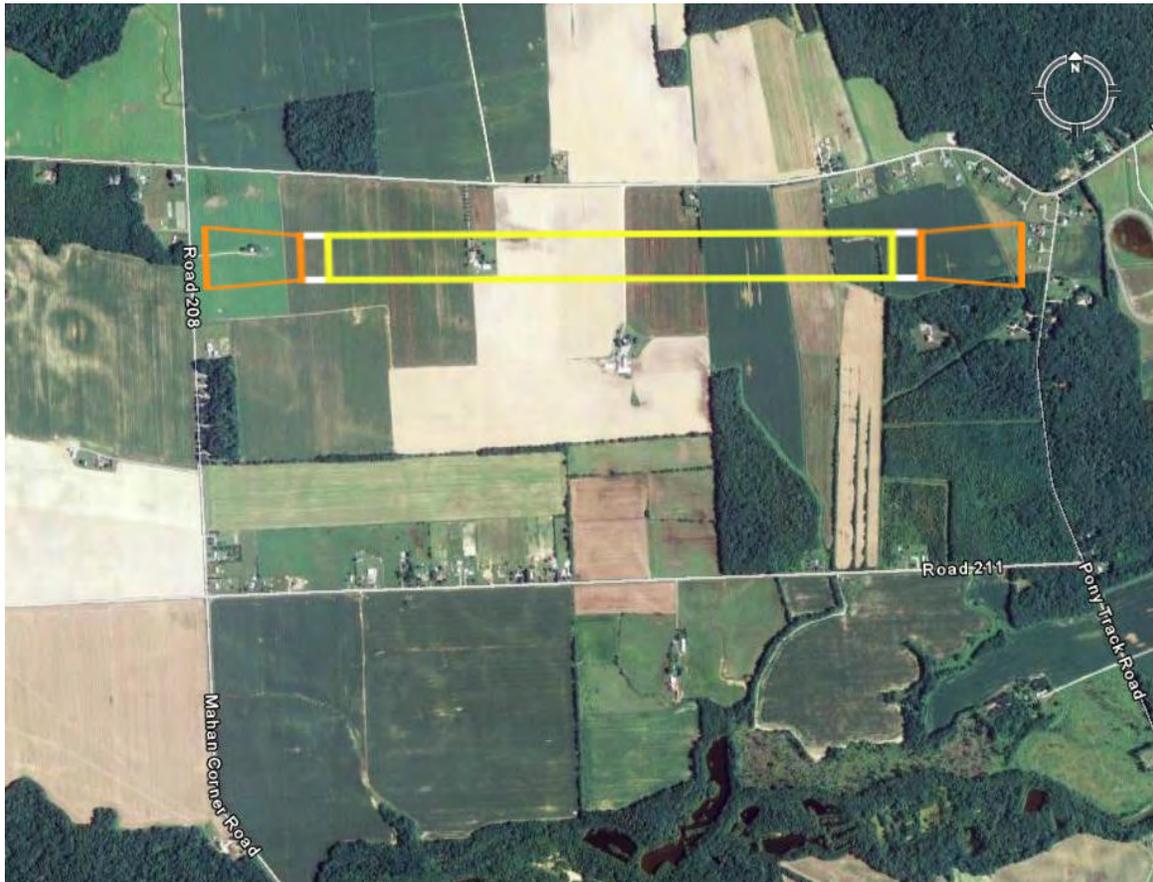
Lat/Long 39 05' 36.61"N, 75 35' 33.61" W

Site Five



The north end of the potential runway facing west

Site Six



Site Six New Airport Site

Location Site Six is located in west-central Kent County along Mud Mill Road

Description This site, by virtue of its remoteness avoids residential development. It also is located on land clear of woods. Lack of convenience to users is one of the drawbacks of this site. Updated information on the site indicates that three houses have been built on the potential runway location and several other houses have been constructed on the eastern end of the potential runway on Pony Track Road.

Lat/Long 39 03' 55.50"N, 75 41' 58.35"W

Site Six



The east end of the potential runway facing the northeast



Looking toward the west end of the potential runway from the east

Site Seven: Henderson Airport



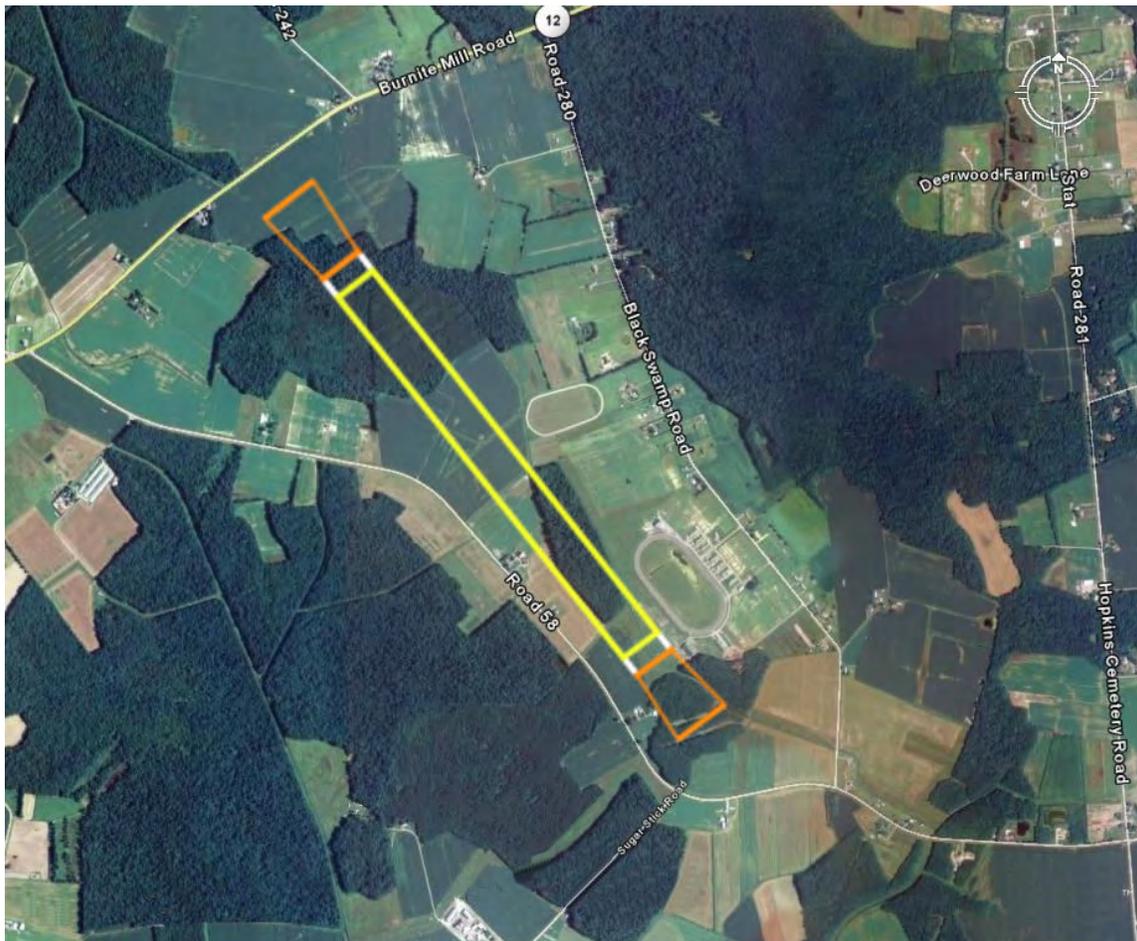
Site Seven Henderson Airport Site

Location Site Seven is located along State Route 15 east of Felton

Description The location of a house on property adjacent to the airport has limited any expansion unless the house is relocated. Updated information on the site indicates that a block of houses has been built on Yoeman's Tale Lane which is on the northwest edge of the potential runway. This development makes Site 7 no longer suitable for airport development.

Lat/Long 39 00' 47.50"N, 75 32' 01.77"W

Site Eight



Site Eight New Airport Site

Location Site Eight is located along State Route 12 in southwest Kent County

Description There has been no major change to Site Eight since the last site selection analysis. The site is relatively flat and expandable, with some tree cover. This tree cover indicates the presence of wetlands, which may be difficult to mitigate. There are a few residential houses and a school close to the potential runway. Because it is located along a State Route that connects to US Highway 13, the site is in the mid-range for accessibility. The site was eliminated in the previous study due to the location of a horse training operation near the potential runway and a large tower just north of the site.

Lat/Long 38 58' 58.99"N, 75 38' 44.22"W

Site Eight



The south end of the potential runway facing east



The middle of the potential runway facing the northeast

Site Nine



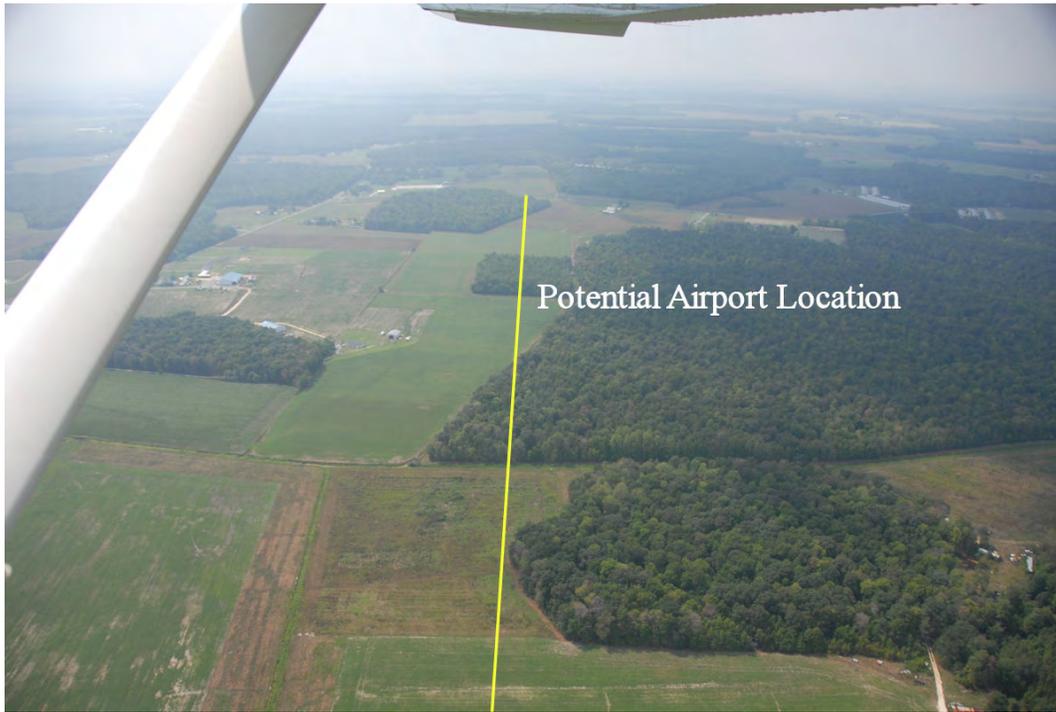
Site Nine New Airport Site

Location Site Nine is located along State Route 12 in southwest Kent County

Description The site is relatively flat with some tree cover. The tree cover indicates the presence of wetlands which may be difficult to mitigate. This site is in the mid-range for accessibility because it is located along a State Route that connects to US Highway 13. Updated information on the sites indicates that new houses have been built near Site Nine's potential runway location.

Lat/Long 38 58' 26.23"N, 75 39' 57.26"W

Site Nine



From the east, looking at the west end of the potential runway

Site Ten



Site Ten New Airport Site

Location Site Ten is located just north of Milford off of State Route 15

Description The site is bounded by Bluejay Lane, Crickett Hollow Lane, Bowman Road, and State Highway 15 and would serve southern Kent County. The site is somewhat distant to Dover. Another drawback to the site is the location of tall radio towers roughly 2 miles to the southwest, directly on the runway centerline. Updated information on the site indicates that there have been no major changes since the 1996 site selection analysis.

Lat/Long 38 57' 30.17"N, 75 27' 46.51"W

Site Ten



The middle of the potential runway facing the northeast direction



The south end of the potential runway facing east

Site Eleven



Site Eleven New Airport Site

Location Site Eleven is located north of Harrington along U.S. Highway 13.

Description The site is bounded to the north by Paradise Alley Road, to the south by Winkler Road, and to the east by wetlands. The site is just south of Killens Pond State Park, and because of its location within southern Kent County, it is not as convenient to the large population centers as some other sites to the north. The site is not expandable and cannot accommodate its runway safety areas without road relocation on one runway end or the other. Updated information on the site indicates that very little new development has occurred since the 1996 study.

Lat/Long 38 57' 35.64"N, 75 33' 35.05"W

Site Eleven

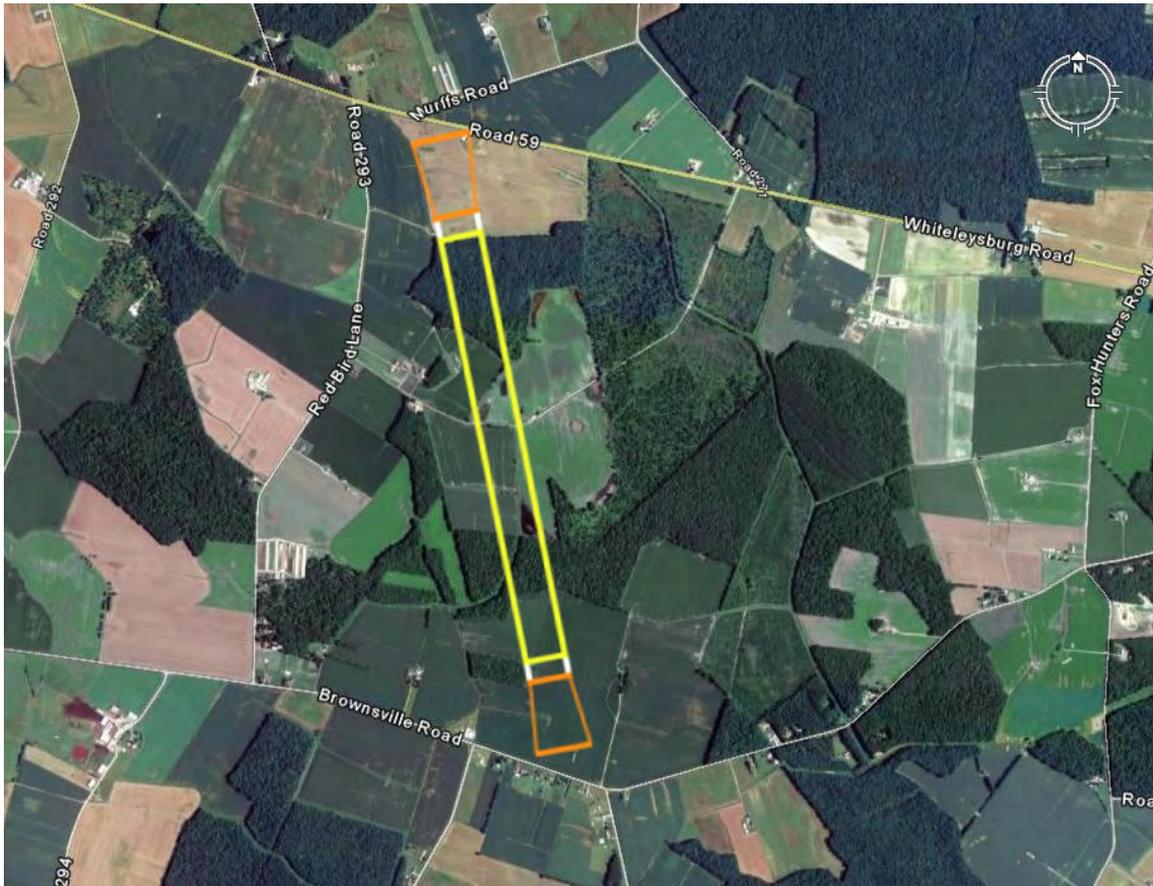


The center of the potential runway facing the east



The north end of the potential runway facing the southeast direction

Site Twelve



Site Twelve New Airport Site

Location Site Twelve is located in southwestern Kent County in a remote area west of Harrington

Description The site is on the Delaware/Maryland state line and would not be convenient to users. The site is located on wooded land and residential houses have been built on the northern half of the potential runway. Due to the remoteness of the runway and the residential houses this site is no longer considered viable.

Lat/Long 38 55' 34.51"N, 75 40' 54.74"W

Site Twelve



The south end of the potential runway

Site Thirteen



Site Thirteen New Airport Site

Location Located in southwestern Kent County in a remote area west of Harrington

Description The site is near the Delaware/Maryland state line, and would not be convenient for users. The site is located on wooded land (implying significant wetland area) with limited expansion capability. On the west side of the proposed runway there are residential houses and on the east side there is a radio tower. Its remoteness and environmental challenges may preclude further consideration as a potential airport.

Lat/Long 38 53' 54.15"N, 75 42' 47.85"W

Site Fourteen: Chorman Airport



Site Fourteen Chorman Airfield

Location Located north of Greenwood

Description Site fourteen is Chorman Airfield, an existing airport on the southern-most border of Kent County. As an existing airport, the site has merit from its use of land as an airport facility. However, the site is limited to perhaps 4,500 feet of runway length in its ultimate configuration unless Andrewville Road is closed or relocated. Also, the fact that it is remote to central Delaware is a negative point for the site. Updated information on the site indicates that there is no major change since the last site selection analysis.

Lat/Long 38 50' 43.60"N, 75 36' 40.40"W

Appendix B: Heliport Subsystem

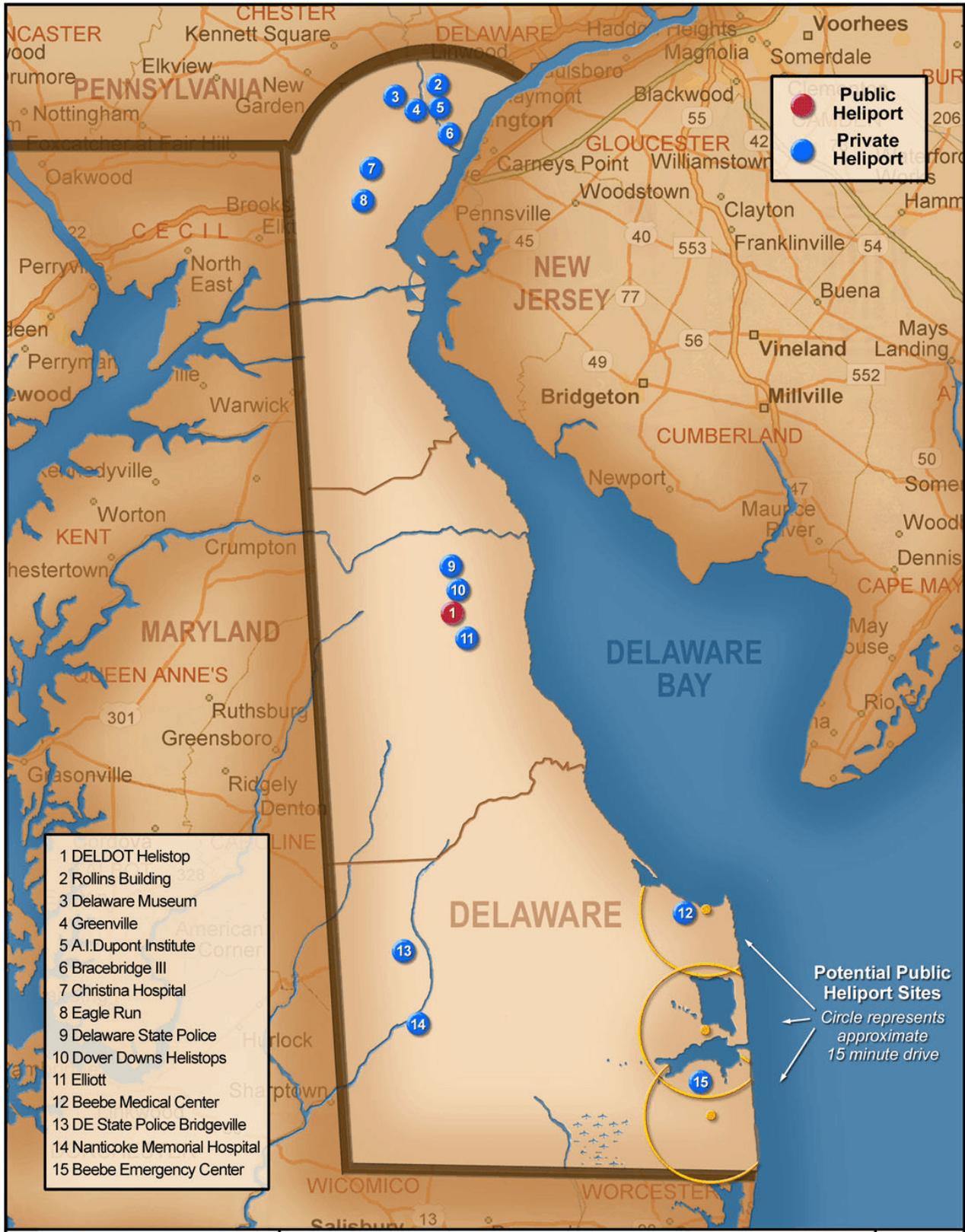


Table 1 - Privately Owned, Private-Use Heliports

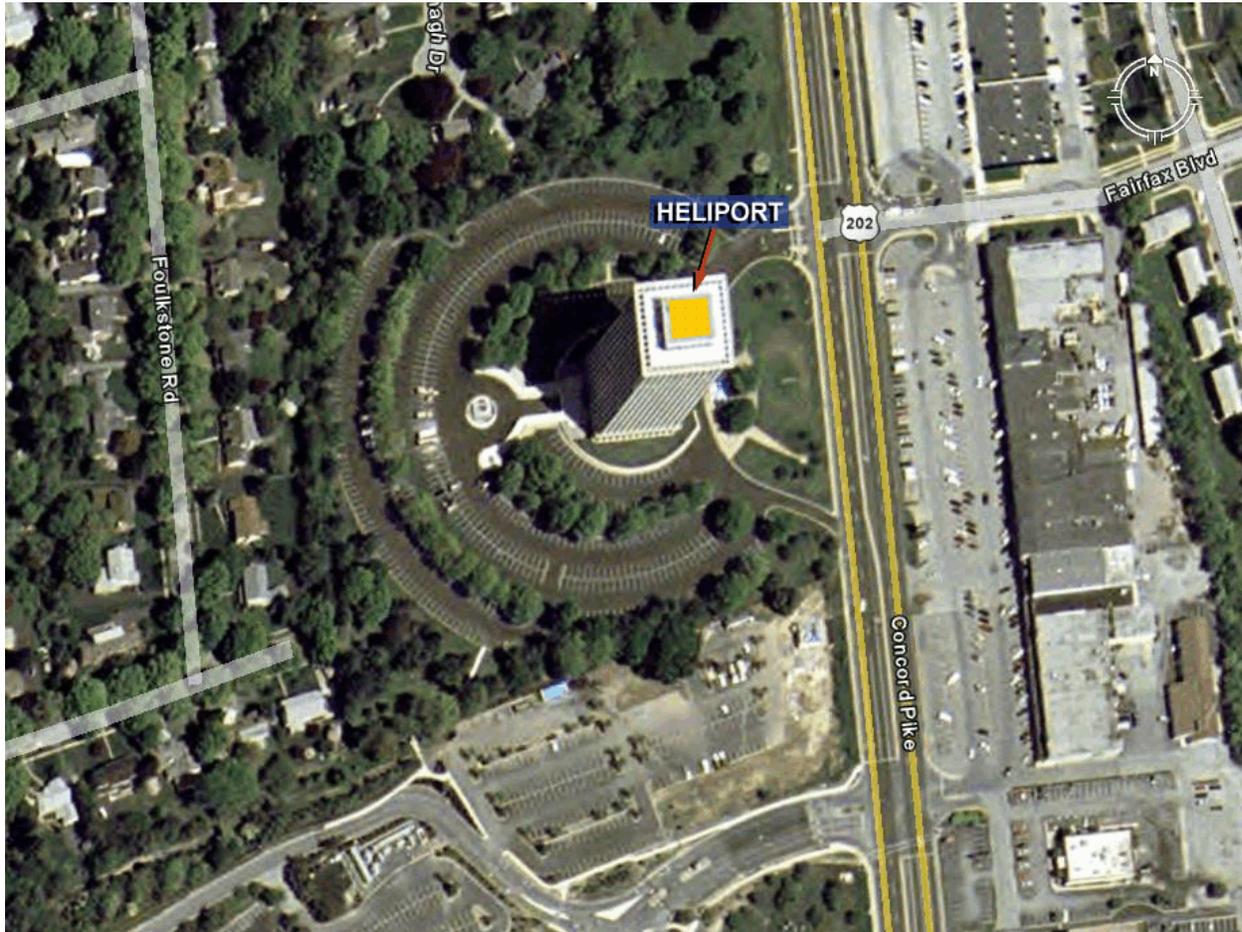
Number	Name	FAA Code*	Facility Type	Description	County	Directions	Owner
1	Rollins Building	DE16	Private Rooftop	66' x 66' Concrete	New Castle	2 miles north of Wilmington, DE on Powder Mill Rd.	Rollins Properties, Inc
2	Delaware Museum	DE06	Private	150' x 150' Turf	New Castle	5 miles northwest of Wilmington near Wilmington Country Club	DE Museum of Natural History
3	Greenville	DE31	Private	80' x 80' Concrete	New Castle	1 Mile north of Wilmington DE on Kennett Pike	MBNA Corp
4	A.I.DuPont Institute	DE28	Private	25' x 25' Concrete	New Castle	3 miles north of Wilmington, DE at 1600 Rockland Rd.	Alfred I DuPont Institute
5	Bracebridge III	DE30	Private Rooftop	83' x 75' Concrete	New Castle	Wilmington DE off North King St.	MBNA Corp
6	Christina Hospital	DE26	Private	120' x 60' Concrete	New Castle	3 miles east of Newark, DE off Churchmans Rd.	Charles R. Sears Sr
7	Eagle Run	DE01	Private	60' x 60' Asphalt	New Castle	1 mile southeast of Christiana, DE at the end of Abby Rd.	E.I. du Pont De Nemours & Co
8	Delaware State Police	DE02	Private	60' x 60' Concrete	Kent	On Leipsic Rd. past Marley Ln, Dover	Delaware State Police
9	Dover Downs Helistops	DE03	Private	2 pads 75'x75' Cement 3 pads 32'x32' Cement	Kent	1 mile north of Dover, on Leipsic Rd. across from Dover International Speedway Off Persimmon Tree Lane near Weaver Dr	Dover Downs
10	DelDOT Helistop	0N5	Public	60' x 60' Asphalt	Kent	On the Delaware Department of Transportation Campus in Dover	State of Delaware
11	Elliott	DE24	Private	50' x 50' Turf	Kent	2 miles south of Dover, on Sorghum Mill Rd past Doty Dr.	Brett Elliott

Table 1 - Privately Owned, Private-Use Heliports

Number	Name	FAA Code*	Facility Type	Description	County	Directions	Owner
12	BeeBe Medical Center (Lewes)		Private Rooftop	Under construction	Sussex	424 Savannah Road Lewes, DE 19958	BeeBe Medical Center
13	Delaware State Police (Bridgeville)		Private	62' x 62' Cement	Sussex	2 miles south of Bridgeville off Public Safety Way	Delaware State Police
14	Nanticoke Memorial Hospital		Private	55' x 60' Cement 100'x100' Turf	Sussex	801 Middleford Road, Seaford, DE 19973 Off of Stein Highway adjacent to Ames Plaza	Nanticoke Memorial Hospital
15	BeeBe Emergency Center (Millville)		Private	Parking Lot	Sussex	In Creekside Plaza on Atlantic Avenue in downtown Millville	BeeBe Medical Center

* Some heliports that are in the process or will begin the process of obtaining a 5010 and a FAA Code

Rollins Building



Name	Rollins Building
FAA Code	DE16
Facility Type	Heliport
Description	66' x 66' Concrete
County	New Castle
Location	Two miles north of Wilmington
Address	2200 Concord Pike Wilmington 19803
Lat/Long	39.791113 / -75.547429
Owner	Rollins Properties, Inc
Phone Number	302 426-2755
Based Aircraft	0

Status: The heliport has not been used in 6 years. There are no obstructions in the area. There is construction on the building. The fire suppression system on pad is temporarily disconnected.

Delaware Museum



Name	Delaware Museum
FAA Code	DE06
Facility Type	Heliport
Description	150' x 150' Turf
County	New Castle
Location	Five miles north of Wilmington off Kennett Pike
Address	4840 Kennett Pike, Wilmington, DE 19807
Lat/Long	39.798205 / -75.610213
Owner	DE Museum of Natural History
Phone Number	302 658-9111
Based Aircraft	0

Status: The heliport has not been used in over 16 years. There is a septic system in the ground around the area that was used for the landing pad. A letter has been sent asking the owners if they want to discontinue the airspace.

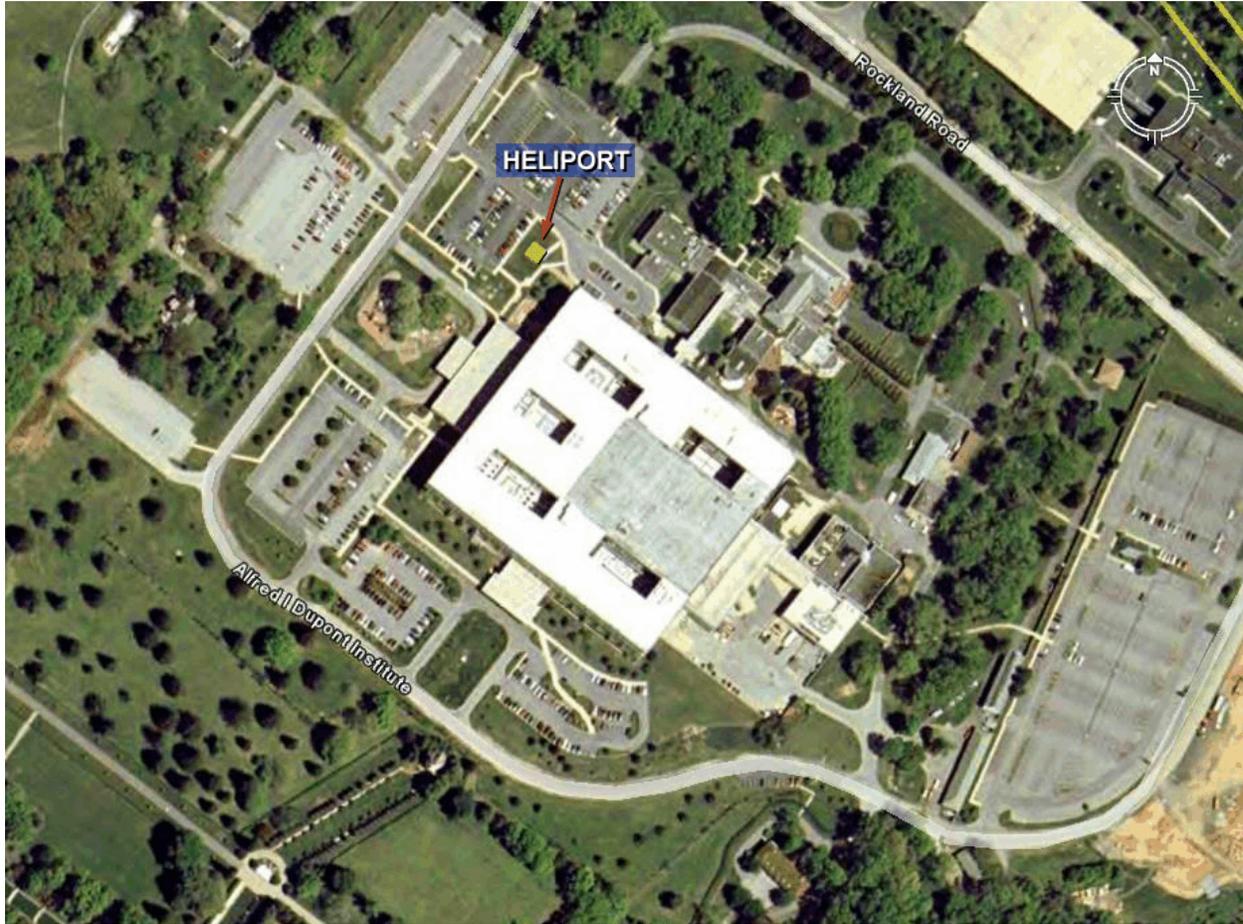
Greenville



Name	Greenville
FAA Code	DE31
Facility Type	Heliport
Description	80' x 80' Concrete
County	New Castle
Location	Half mile southeast of Greenville
Location	Off Kennett Pike on Montchanin Rd
Lat/Long	39.771262 / -75.585439
Owner	The site is for sale
Phone Number	302 325-7705
Based Aircraft	0

Status: The site is for sale. The helipad has been covered over by dirt and grass. There is a 120 foot building 1,060 feet to the southeast of the helipad and trees 1,060 feet northeast of the pad.

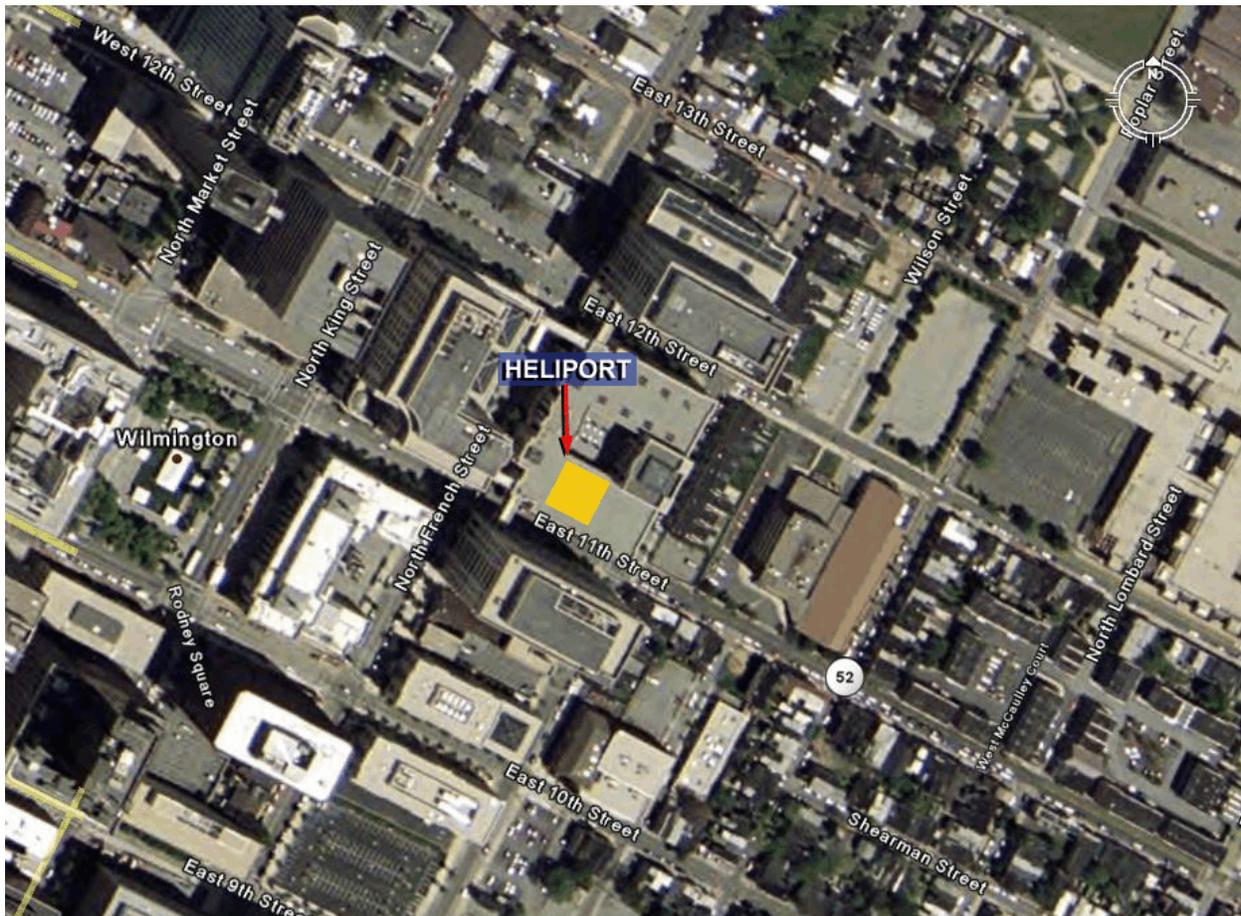
A.I. DuPont Institute



Name	A.I. DuPont Institute
FAA Code	DE28
Facility Type	Airport
Description	25' x 25' Concrete
County	New Castle
Location	One mile north of Wilmington
Address	1600 Rockland Rd, Wilmington, DE 19884
Lat/Long	39.780471 / -75.555824
Owner	Alfred I DuPont Institute
Phone Number	302 651-4000
Based Aircraft	0

Status: The heliport is lighted and is equipped with a fire suppression system. The only obstruction is the DuPont Institute building which is 105 feet to the southeast of the landing pad. The approach is over the parking lot.

Bracebridge III



Name	Bracebridge III
FAA Code	DE30
Facility Type	Heliport
Description	83' x 75' Concrete; Rooftop
County	New Castle
Location	Downtown Wilmington
Address	1100 N King St. Wilmington, DE, 19884
Lat/Long	39.745561 / -75.544551
Owner	MBNA Corp
Phone Number	302 325-7705
Based Aircraft	0

Status: The helipad has not been used in almost two years. The helipad has perimeter lights, fire suppression system, and good markings. The approach to the pad from the southeast. The obstructions are 120 foot high building 530 feet southeast; 120 foot high building 1,060 feet northwest; 23 foot high building 530 feet northeast; and a 120 foot high building 1,580 feet north.

Christina Hospital



Name	Christina Hospital
FAA Code	DE26
Facility Type	Heliport
Description	120' x 60' Concrete; Three pads
County	New Castle
Location	Three miles east of Newark off Ogletown-Stanton Rd
Address	4755 Ogletown-Stanton Road, Newark DE 19718
Lat/Long	39.687523 / -75.667012
Owner	Medical Center of Delaware
Phone Number	302 733-1000
Based Aircraft	0

Status: The pads are marked and have perimeter lights. The Christiana Hospital building is 60 feet from the pads and there are two light poles in the parking lot that have red obstruction lights on them. The site has an estimated 1,900 operations per year.

Eagle Run



Name	Eagle Run
FAA Code	DE01
Facility Type	Heliport
Description	60' x 60' Asphalt
County	New Castle
Location	One mile southeast of Christina on Eagle Run Rd.
Address	500 Eagle Run Rd, Newark, DE 19702
Lat/Long	39.674852 / -75.670365
Owner	E.I. du Pont De Nemours & Co
Phone Number	302 996-8031
Based Aircraft	0

Status: The heliport has not been used since 1997. The Sears Outlet Store uses the pad to park advertising trucks. A letter has been sent asking the owners if they want to discontinue the airspace. There is a 45 foot high flag pole 85 feet southwest of the pad. There are two 150 foot high light poles 530 feet north and 500 feet west of the pad at the Interstate highway interchange.

Delaware State Police



Name	Delaware State Police
FAA Code	DE02
Facility Type	Heliport
Description	60' x 60' Concrete
County	Kent
Location	North of Dover Downs
Address	P.O. Box 430, Dover, DE 19903
Lat/Long	39.193754 / -75.544092
Owner	Delaware State Police
Owner Phone Number	302 739-5951
Based Aircraft	3

Status: The heliport is used by the State Police. The power lines by North Dupont Highway are marked. The controlling obstruction is the 290 foot high tower that is 189 feet southeast of the pad. During race days at Dover Downs, private helicopters land and takeoff from the pad.

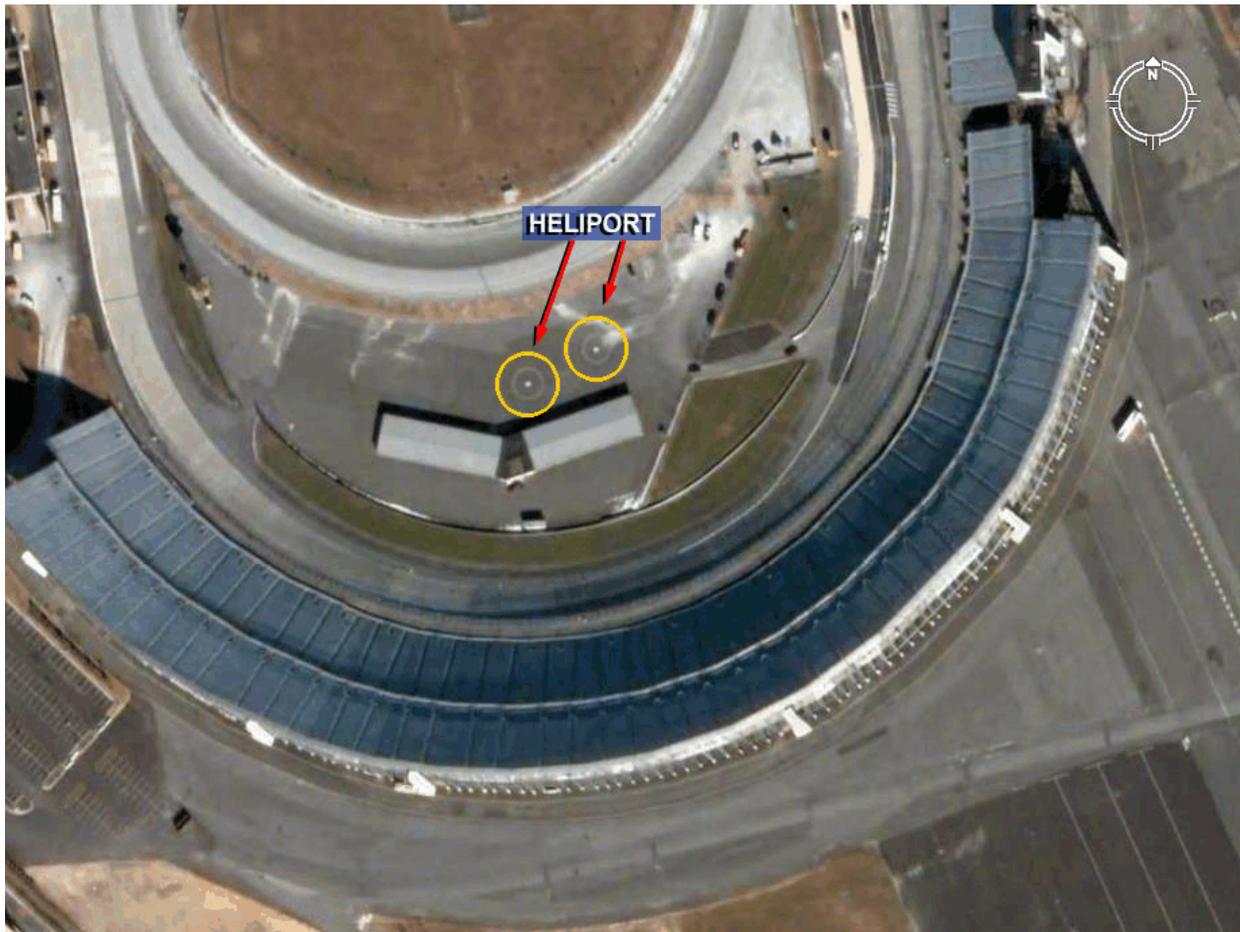
Dover Downs: Outside



Name	Dover Downs
FAA Code	DE03
Facility Type	Heliport
Description	3 pads, each 32' x 32' Cement
County	Kent
Location	Downtown Dover
Directions	Off Persimmon Tree Lane near Weaver Dr.
Lat/Long	39.187476 / -75.530085
Owner	Dover Downs
Owner Phone Number	302 857-3217
Based Aircraft	0

Status: During race day, more helipads are spray painted in the grass. These pads are only used on race day. The closest pad is 110 feet from the road. A residential neighborhood is located on the other side of the road. There are unmarked 32 foot high power lines on the heliport side of the road.

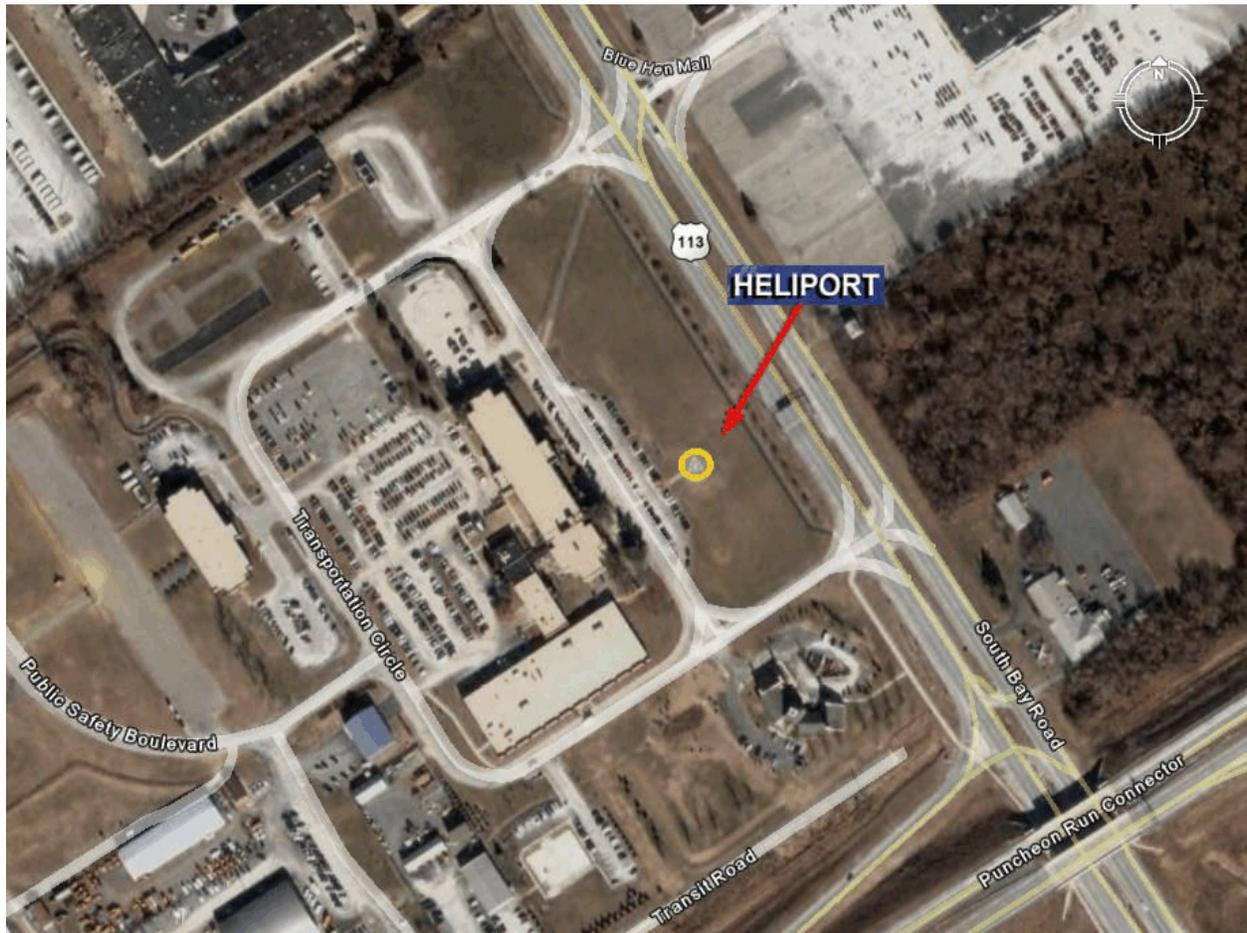
Dover Downs: Inside



Name	Dover Downs
FAA Code	DE03
Facility Type	Heliport
Description	2 pads, each 75' x 75' Cement
County	Kent
Location	Downtown Dover
Address	1131 N Dupont Highway, Dover, DE 19901
Lat/Long	39.187476 / -75.530085
Owner	Dover Downs
Owner Phone Number	302 857-3217
Based Aircraft	0

Status: The two helipads are located in the southern part of Dover Downs. Helicopters land and take off during race day to and from the east over the 114 foot high grandstand.

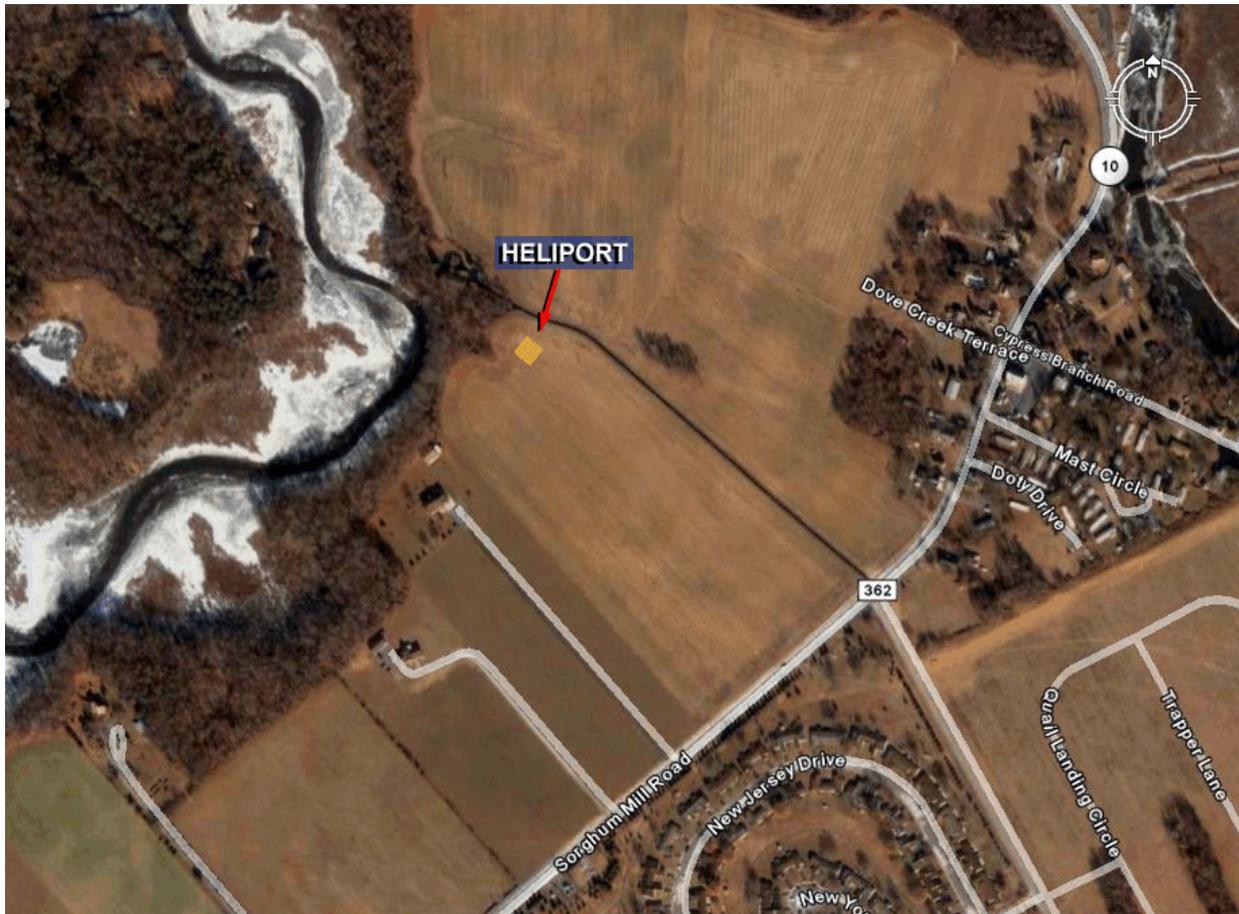
DelDOT Helistop



Name	DelDOT Helistop
FAA Code	0N5
Facility Type	Heliport
Description	60' x 60' Asphalt
County	Kent
Location	In the city of Dover
Address	800 Bay Road, Dover, DE 19901
Lat/Long	39.148188 / -75.503532
Owner	State of Delaware
Owner Phone Number	302-760-2149
Based Aircraft	0

Status: DelDot Helistop is Delaware's only public heliport. The Helistop has perimeter lighting, plenty of parking and no major obstructions.

Elliott



Name	Elliott
FAA Code	DE24
Facility Type	Heliport
Description	50' x 50' Turf
County	Kent
Location	Two miles South of Dover
Address	999 Sorghum Mill Rd, Dover, DE 19962
Lat/Long	39.1115014 / -75.5054783
Owner	Brett Elliott
Owner Phone Number	302 697-1467
Based Aircraft	1

Status: There are no heliport facilities. The landing area is near the trees away from the road.

BeeBe Medical Center (Lewes)



Name	BeeBe Medical Center
FAA Code	N/A
Facility Type	Heliport
Description	60' x 60' Rooftop
County	Sussex
Location	In the City of Lewes
Address	424 Savannah Road Lewes, DE 19958
Lat/Long	38.771079 / -75.143170
Owner	BeeBe Medical Center
Owner Phone Number	302 645-3235
Based Aircraft	0

Status: The helipad is still under construction.

State Police (Bridgeville)



Name	Bridgeville State Police
FAA Code	N/A
Facility Type	Heliport
Description	62' x 62' Cement
County	Sussex
Location	Two miles south of Bridgeville
Address	9265 Public Safety Way, Bridgeville, DE 19933
Lat/Long	3.877179 / -75.88357
Owner	Delaware State Police
Owner Phone Number	302 337-1090
Based Aircraft	0

Status: The helipad is marked and has driveway access for medivac. There are two light poles in adjacent parking lot that are marked with red lights. There are no major obstructions or roadway conflicts.

Nanticoke Memorial Hospital



Name	Nanticoke Memorial Hospital
FAA Code	N/A
Facility Type	Heliport
Description	55' x 60' cement
County	Sussex
Location	In the city of Seaford
Address	801 Middleford Rd, Seaford, DE 19973
Lat/Long	38.641864 / -75.604454
Owner	Nanticoke Memorial Hospital
Owner Phone Number	302 629 6611
Based Aircraft	0

Status: The helipad is located on the northern side of the facility. The pad is marked and there are no roadway or obstruction conflicts.

Nanticoke Memorial Hospital Remote Location



Name	Nanticoke Memorial Hospital
FAA Code	N/A
Facility Type	Heliport
Description	100' x 100' Turf
County	Sussex
Location	In the city of Seaford
Directions	Off of Stein Highway adjacent to Ames Plaza
Lat/Long	38.651581 / -75.600560
Owner	Nanticoke Memorial Hospital
Owner Phone Number	302 629 6611
Based Aircraft	0

Status: The remote location for Nanticoke Memorial Hospital is located north of the hospital complex next to a Ames Plaza. There are no major obstructions or roadway conflicts.

BeeBe Emergency Center (Millville)



Name	BeeBe Emergency Center (Millville)
FAA Code	N/A
Facility Type	Heliport
Description	50' x 60' Concrete
County	Sussex
Location	Downtown Millville in Creekside Plaza
Address	Atlantic Avenue, Millville, DE 19970
Lat/Long	3.8547331 / -75.106917
Owner	BeeBe Medical Center
Owner Phone Number	302 539 6404
Based Aircraft	0

Status: The helipad is in the parking lot of the BeeBe Emergency Center. When landing a helicopter in the parking lot, some cars may have to be moved out of the way.

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

1. SELECTION OF RECOMMENDED AVIATION SYSTEM

From the Evaluation of Alternatives, Alternative 2 - Expansion of the Aviation System was preliminarily selected as preferred. The results of this evaluation were subject to review by the Delaware Aviation Advisory Committee (DAAC). Discussion and review from the DAAC resulted in a slightly altered Recommended Plan than was presented in Alternative 2. These changes revolved around better geographic coverage for the provision of airport and heliport facilities. In this manner, the recommended plan included improvements to the preferred alternative, incorporating most of the desired recommendations in a practical and implementable airport system plan. The preferred alternative and the results of the review process are described below.

1.1 The Preferred Alternative

As mentioned in Chapter 6, the preferred alternative was Alternative 2, Expansion of Aviation System. This selection was made after consideration of two other alternatives. All of the alternatives were subjected to a quantitative evaluation, where each airport in each alternative was assigned a relative score based upon how well the alternative performed against the criteria. Evaluation criteria included the following:

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

Individual scores were then totaled for each alternative, creating a total score that indicated each alternative's performance. The performance of each alternative could then be compared on this objective scale. As summarized in Chapter 6, Alternative 2 - Expansion of the Aviation System - scored a 19.9, the highest of all alternatives, in the evaluation process. The other two alternatives, Alternative 1 - No Action and Alternative 3 - Contracted Airport System, scored 17.2 and -16.0, respectively.

Overall, the No Action alternative performed relatively well in terms of cumulative scoring; however, this was due in large part to the assumption that development costs would be zero. The Expanded Aviation System Alternative, however, outperformed the No Action Alternative by a total margin of 2.7 points. The Expanded Aviation System was superior in its ability to serve forecast demand and in its surface access ratings. Aside from development costs, Alternative 1 performed only marginally better than Alternative 2 in airspace compatibility and environmental and land use

compatibility. Alternative 3 performed better than Alternative 2 in airspace compatibility, environmental and land use compatibility; however, development costs were estimated to be approximately \$5,862,300 higher, due to no future use of the Civil Air Terminal and the need to accommodate demand from privately owned airports (which were assumed to be closed in the future) at the remaining public facilities. The spin-off impacts of this would increase costs at Delaware Airpark and Sussex County Airport.

Once the quantitative scoring analysis was completed, a sixth and more qualitative criteria, Sociopolitical Acceptability, was assessed of each alternative. That is, which alternatives were popular with aviation industry users, planners and local residents? The Delaware Aviation Advisory Committee (DAAC) was the sounding board for this factor and their input altered the final recommendation.

Based on the evaluation, the preferred alternative was Alternative 2, Expansion of Aviation System. During the evaluation process, it became clear that the other two alternatives assumed an outlook for Delaware that does not endeavor to meet demand or provide for improved access to the state air transportation system. The recommendation of Alternative 2, on the other hand, is a statement that DelDOT will continue to support communities, residents, and business stakeholders who rely on the air transportation system in the State of Delaware.

1.2 Delaware Aviation Advisory Council Review

The Delaware Aviation Advisory Council reviewed this recommendation with the Consultant to ensure practicality and reasonableness in the final plan. In this review process, several changes were added to Alternative 2 - Expansion of the Aviation System, the preferred alternative. In particular, resolutions passed by the DAAC included the following:

- **Concerning Eastern Sussex County:** “Explore air service locations to ensure adequate coverage of eastern Sussex County, using any mix of airport and heliports needed to ensure basic coverage.”
- **Concerning Heliport Coverage:** “Include a Wilmington public-use heliport location as a recommendation for study/action.”
- **Concerning Central Delaware Subsystem:** “Keep the current roles for Delaware Airpark and the CAT with contingency plans to preserve expansion options at Delaware Airpark if the Air Force reduces or eliminates civil use of Dover AFB. The CAT will handle all large business jet activity while Delaware Airpark will serve propeller and turboprop aircraft.”

Specific additions to the Recommended Plan included the following:

- A public-use airport in coastal Delaware should be included in the Recommended Plan. The System Plan supports the concept of general aviation air access to that unserved portion of Delaware. Discussion centered around

the possibility of converting West's Airport from private use to public use.

- At least one public-use heliport should be located in each Delaware county.

Using the above modifications to the Preferred Alternative, a Recommended Plan was developed. These improvements, combined with demand-driven expansions of the airfield and landside areas of system airports make up the total facility attributes of the Recommended Plan.

2. RECOMMENDED SYSTEM DESCRIPTION

The Recommended Aviation System is described in terms of the following:

- Airport Roles
- Airport Facilities
- Airspace Configurations
- Capital Cost Estimates

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

2.1 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. Throughout the State of Delaware each airport has a specific function or role which contributes toward that central purpose. The Recommended Aviation System, therefore, assigns roles to each airport, based upon the projected levels of demand and the most effective manner of providing service and access to those using the system. 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. The airports in this category that are included in the Recommended Plan are:

- Chandelle Estates
- Jenkins Airport
- Laurel Airport
- Smyrna Airport

The role of airports in these categories includes recreational flying, aerial application/spray business flying, parachute training (Laurel Airport), and pilot training. By providing facilities for these activities and these based aircraft, congestion at the State's larger airports can be decreased and capacity can be preserved for demand growth into the future by operators whose aircraft require such facilities. By the year 2025, these Less-than-A-I category airports are anticipated to accommodate approximately 83 based aircraft (12 percent of the State total), and 22,500 local operations (8 percent of State total local operations). All of these airports accommodate primarily small, single engine aircraft, which is the primary role of each facility.

In addition to these existing airports, a public-use airport in coastal Sussex County was suggested by the DAAC. In this regard, the possibility exists that West's Airport could be converted to public use from its current private use designation. Such a conversion could double as one of the coastal helipad access points.

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. For example, these airports are projected to serve approximately 10,000 jet operations by 2025. This level of jet activity is in addition to more than 14,100 multi-engine operations, and over 6,800 rotorcraft operations during the same timeframe. In order to do so, the Recommended System Plan includes some level of airfield improvements, such as primary runway lengthening and/or widening projects, to provide for added safety. The Recommended System Plan also estimates a need for 62 T-hangar storage units, conventional hangar storage, terminal building improvements, and apron area aircraft storage. All of these recommended airside and landside improvements are responsive to forecast levels of demand, including the need to accommodate over 41 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.

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 qualified civil aircraft operations. In this regard, it is forecast to receive just 1,400 civil aircraft operations and 10,500 general aviation enplanements by 2025. Sussex County is forecast to accommodate nearly 70,000 general aviation operations by 2025, and 36,300 general aviation enplanements by that time.

New Castle Airport will continue to lead the State as the largest and busiest general aviation airport, with general aviation operations forecast to reach 159,300 annually by 2025. The facility has been characterized by its sponsor as the best corporate and business airport in the nation. As such, it caters to clientele operating business jet aircraft or sophisticated turboprop equipment. While smaller aircraft are still accommodated, the focus for New Castle Airport as a business has been on the corporate and business flying segment of the market.

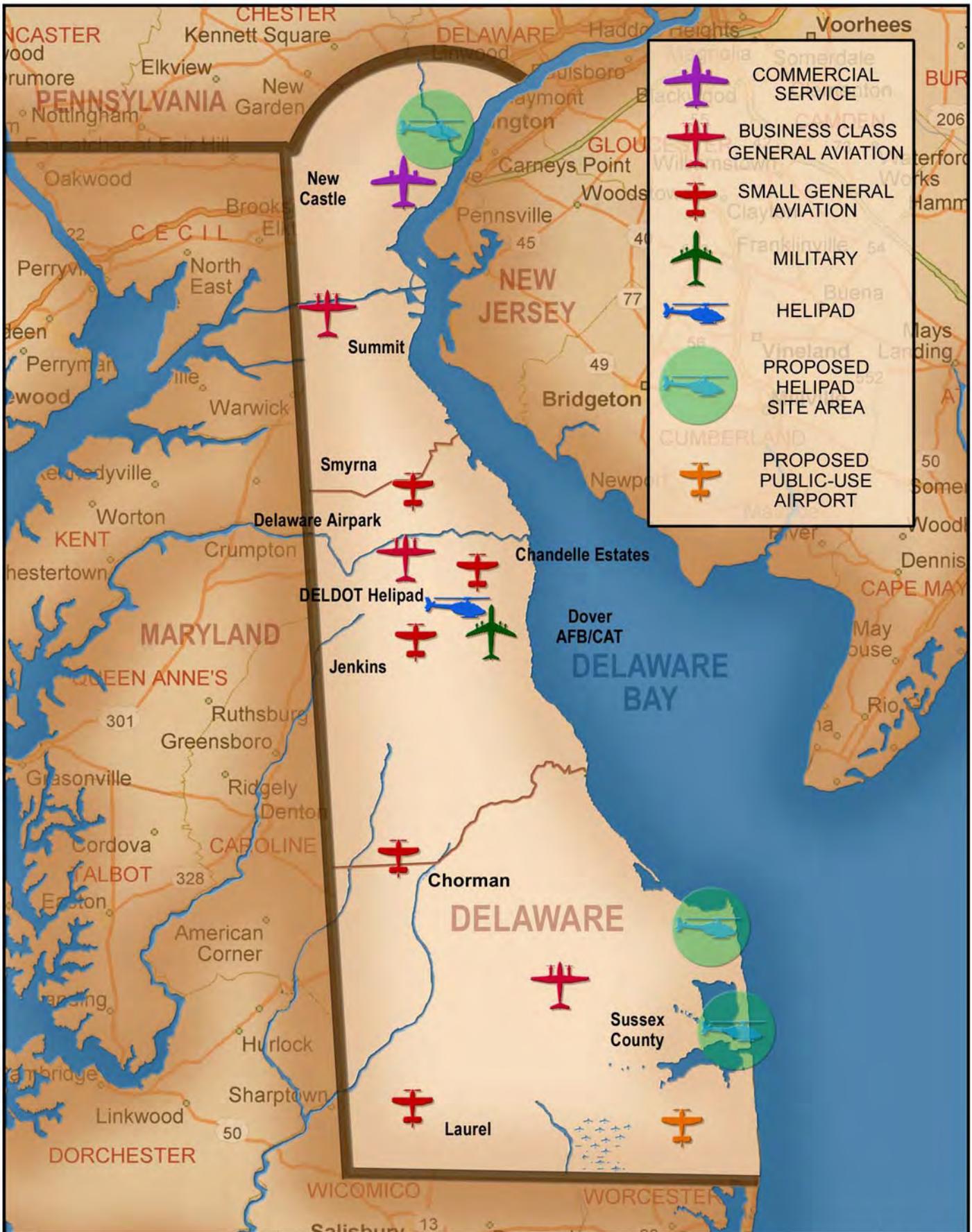
2.2 Airport Facilities

Figure 7-1 graphically depicts the location of each of the 10 airports and one heliport in the Recommended Aviation System. Table 7-1 presents 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. In Table 7-1, recommendations for additional SASP facilities by airport are shown with associated total development costs.

Table 7-1 - Additional Recommended SASP Airport Facility Development							
SASP Facility	Airfield (Primary RWY)	Terminal Building (SF)	Apron Area (SY)	Conventional Hangar (SF)	T- Hangar (Units)	Auto Parking (SY)	Total Costs
Chandelle Estates	32' in width	None	1,300	None	5	None	\$322,500
Civil Air Terminal/ Dover AFB	N/A	None	8,600	N/A	N/A	805	\$1,790,000
Chorman Airport	12' in length 20' in width	500	6,000	None	30	700	\$1,928,000
Delaware ¹ Airport	618' in length 15' in width	None	None	None	16	None	\$14,904,000
Jenkins Airport	None	500	None	None	3	None	\$235,000
Laurel Airport	None	None	None	None	None	None	\$3,500,000
New Castle Airport	None	30,000	5,300	None	79	None	\$37,868,000
Smyrna Airport	None	None	None	None	1	None	\$45,000
Summit Airport ¹	833' in length 10' in width	None	None	30,600	16	None	\$10,711,500
Sussex County Airport ¹	1,000' in length	None	None	None	28	None	\$55,465,000
New Heliports	None	None	1,200	None	None	600	\$180,000
Total Additional Facilities	2,463' in length 77' in width	31,000	22,400	30,600	178	2,105	\$126,949,000

¹ Recommendations from Airport Master Plan.

² Public-use airport not included in table since conversion of West's from private use to public use (still privately owned) would not involve new facilities. Further, unless local support emerges, no publicly owned facility can be developed (to date, no potential public sponsor has emerged).



2.3 Airspace Configurations

Figures 7-2 and 7-3 present the Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) airspace configurations for the Recommended Plan. Of the VFR airspace overlaps shown in Figure 7-2, none are considered serious or significant. Similarly, all of the IFR overlaps are workable within the FAA airspace system and do not present significant airspace conflicts.

As mentioned in the Phase I study, the airspace within Delaware is composed of Classes A, B, D, and E, which are Controlled Airspace. Additionally, the State does have Class G airspace, which is Uncontrolled. Although there is no *special use* airspace in Delaware, it should be noted that extensive military training activity using Lockheed Galaxy C5's and other large military transport aircraft is forecast to continue at Dover AFB.

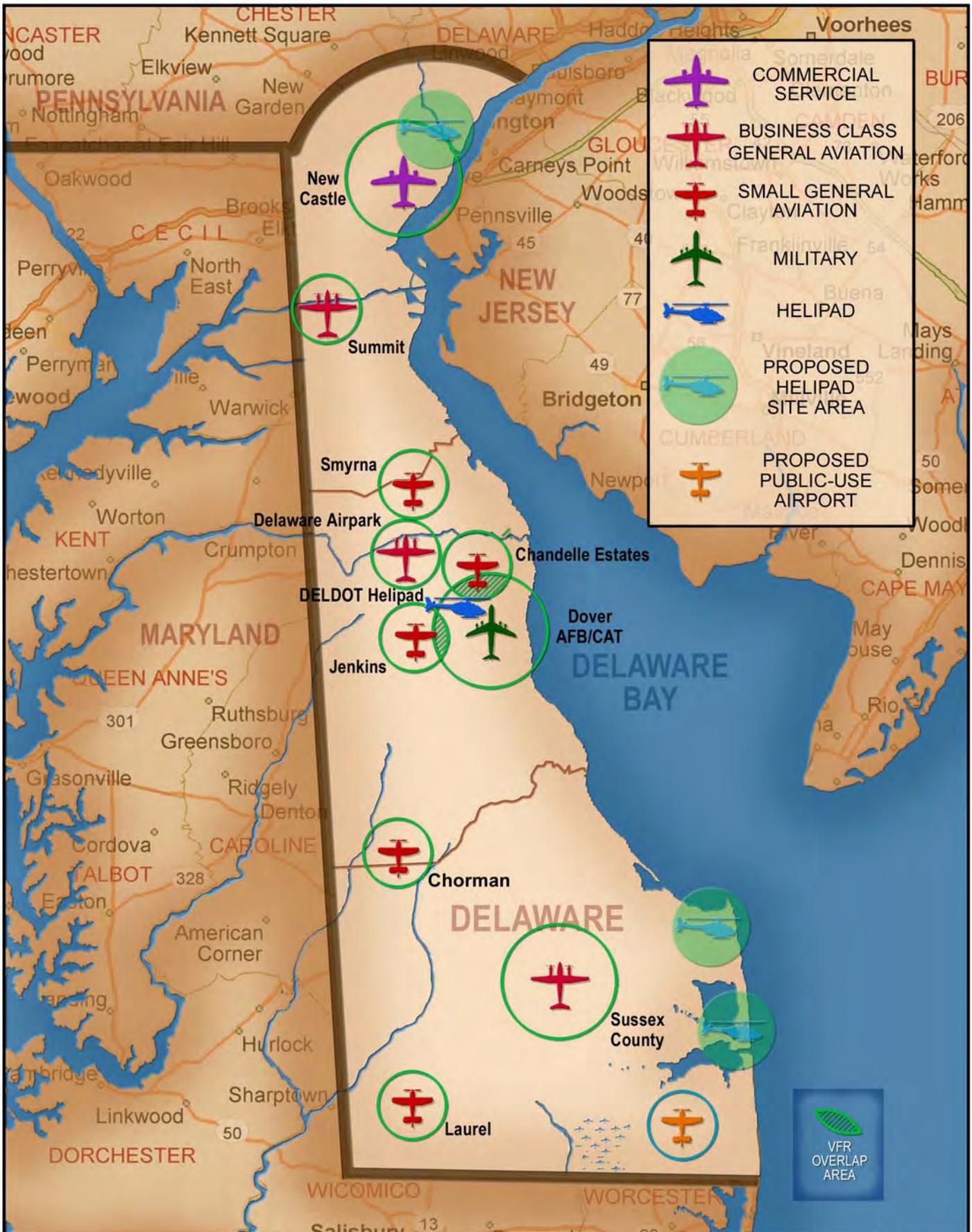
The FAA has primary responsibility for the development and management of the airways system. As such, recommendations for changes to IFR airspace configuration, and specifically pertaining to Air Traffic Control (ATC) facilities or equipment in the State of Delaware are beyond the scope of this Plan. However, increases in activity levels will require no changes from existing VFR patterns in the Recommended Aviation System. While overlaps will continue in Kent County; no conflicts are anticipated during the planning period. With this in mind, the focus of this analysis is directed toward specific airport instrumentation that can serve to increase the level of safety at system airports.

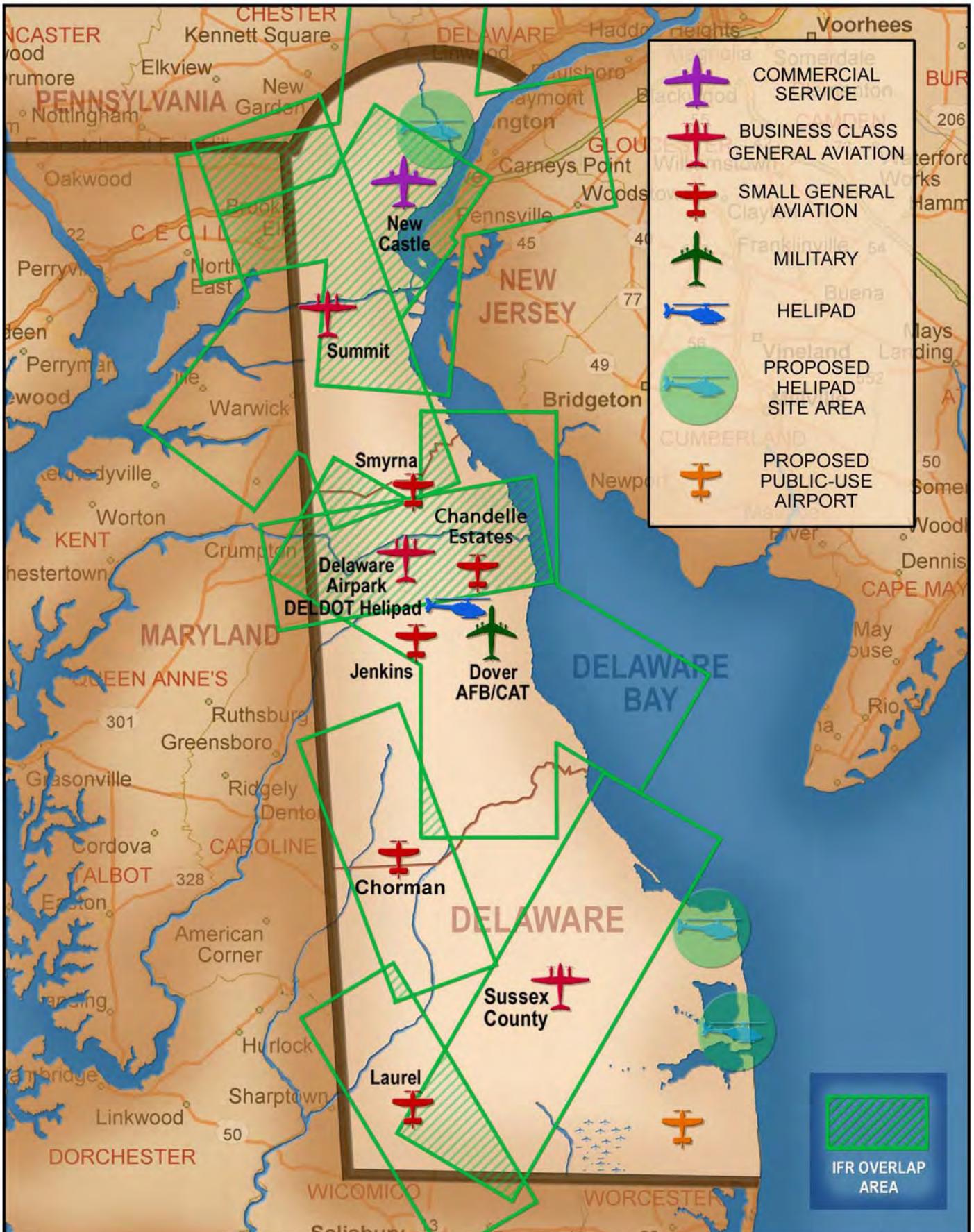
The facility needs portion of this System Plan specified recommendations for the provision of nonprecision and precision instrument approaches at system airports. Currently, six airports (New Castle, Summit Airport, Sussex County Airport, Delaware Airpark, Laurel Airport, and Dover AFB) are already equipped with a minimum of one or more nonprecision instrument approaches. Of these airports, New Castle Airport and Dover AFB have precision instrument approaches. Sussex County is in the process of upgrading from a nonprecision to a precision approach.

Chorman Airport has current activity levels required to justify an instrument approach; however, current runway safety areas will not permit in instrument approach due to less than standard separation between runway and various hangar facilities. Therefore, Chorman will not be eligible until either the runway or hangar facilities are relocated.

2.4 Capital Cost Estimates

Capital development costs for the Recommended Aviation System were estimated to total \$126,949,000. These cost estimates correspond to the recommended facility development schedules shown previously in this System Plan, but may vary somewhat to account for land acquisition. These estimates do include consideration of costs available from individual airport master plans; however, they 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:

- Historical cost data from recent Delaware airport planning documents and construction contracts.
- Cost data from other statewide aviation planning documents.
- Examination of Airport Capital Improvement Plans (ACIPs) filed with the FAA.
- Discussions with various Delaware airport sponsors.

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 7-2 indicates what these costs may look like, estimating \$80,314,833 for the short range, \$21,590,833 for the intermediate range, and \$25,043,334 for the long range periods.

Table 7-2 - Development Costs for Recommended SASP by Phase				
SASP Facility	2010	2015	2025	Total Costs
Chandelle Estates	\$0	\$97,500	\$225,000	\$322,500
Civil Air Terminal/Dover AFB	\$596,667	\$596,667	\$596,667	\$1,790,000
Chorman Airport	\$450,000	\$739,000	\$739,000	\$1,928,000
Delaware Airport	\$4,968,000	\$4,968,000	\$4,968,000	\$14,904,000
Jenkins Airport	\$135,000	\$0	\$100,000	\$235,000
Laurel Airport	\$1,166,666	\$1,166,666	\$1,166,667	\$3,500,000
New Castle Airport	\$26,813,000	\$3,555,000	\$7,500,000	\$37,868,000
Smyrna Airport	\$45,000	\$0	\$0	\$45,000
Summit Airport	\$4,155,500	\$3,638,000	\$2,918,000	\$10,711,500
Sussex County Airport	\$41,925,000	\$6,770,000	\$6,770,000	\$55,465,000
New Heliports	\$60,000	\$60,000	\$60,000	\$180,000
Total Additional Facilities	\$80,314,833	\$21,590,833	\$25,043,334	\$126,949,000

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. Additionally, costs to remove obstructions at Recommended Aviation System airports, or other special projects not otherwise noted, have not been determined at this time.

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 & 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
 - Contingency Planning
 - Legislation and Regulations
 - 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 (2005-2010), intermediate (2011-2015), and long range (2016-2025) 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 2005 dollars for the 20 year (2005-2025) program is estimated at \$126,949,000. 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:	\$ 92,375,624
● State Funding:	\$ 2,518,438
● Local Funding:	\$ 19,514,550
● Private Funding:	\$ 12,540,388
TOTAL	\$ 126,949,000

Table 8-1 - Airport Funding Eligibility				
SASP Facility	2010	2015	2025	Total Costs
Chandelle Estates	\$0	\$97,500	\$225,000	\$322,500
Federal	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0
Local	\$0	\$0	\$0	\$0
Private	\$0	\$97,500	\$225,000	\$322,500
Total	\$0	\$97,500	\$225,000	\$322,500
Chorman Airport	\$450,000	\$739,000	\$739,000	\$1,928,000
Federal	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0
Local	\$0	\$0	\$0	\$0
Private	\$450,000	\$739,000	\$739,000	\$1,928,000
Total	\$450,000	\$739,000	\$739,000	\$1,928,000
Civil Air Terminal/Dover AFB	\$596,667	\$596,667	\$596,666	\$1,790,000
Federal	\$566,833	\$566,833	\$566,833	\$1,700,500
State	\$14,917	\$14,917	\$14,917	\$44,750
Local	\$14,917	\$14,917	\$14,916	\$44,750
Private	\$0	\$0	\$0	\$0
Total	\$596,667	\$596,667	\$596,666	\$1,790,000
Delaware Airpark	\$4,968,000	\$4,968,000	\$4,968,000	\$14,904,000
Federal	\$4,719,600	\$4,719,600	\$4,719,600	\$14,158,800
State	\$124,200	\$124,200	\$124,200	\$372,600
Local	\$124,200	\$124,200	\$124,200	\$372,600
Private	\$0	\$0	\$0	\$0
Total	\$4,968,000	\$4,968,000	\$4,968,000	\$14,904,000
Jenkins Airport	\$135,000	\$0	\$100,000	\$235,000
Federal	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0
Local	\$0	\$0	\$0	\$0
Private	\$135,000	\$0	\$100,000	\$235,000
Total	\$135,000	\$0	\$100,000	\$235,000
Laurel Airport	\$0	\$3,500,000	\$0	\$3,500,000
Federal	\$0	\$3,325,000	\$0	\$3,325,000
State	\$0	\$175,000	\$0	\$175,000
Local	\$0	\$0	\$0	\$0
Private	\$0	\$0	\$0	\$0
Total	\$0	\$3,500,000	\$0	\$3,500,000
New Castle Airport	\$26,813,000	\$3,555,000	\$7,500,000	\$37,868,000
Federal	\$25,472,350	\$0	\$3,562,500	\$29,034,850
State	\$670,325	\$0	\$93,750	\$764,075
Local	\$670,325	\$3,555,000	\$93,750	\$4,319,075
Private	\$0	\$0	\$3,750,000	\$3,750,000

Table 8-1 - Airport Funding Eligibility				
SASP Facility	2010	2015	2025	Total Costs
Total	\$26,813,000	\$3,555,000	\$7,500,000	\$37,868,000
Smyrna Airport	\$45,000	\$0	\$0	\$45,000
Federal	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0
Local	\$0	\$0	\$0	\$0
Private	\$45,000	\$0	\$0	\$45,000
Total	\$45,000	\$0	\$0	\$45,000
Summit Airport	\$4,155,500	\$3,638,000	\$2,918,000	\$10,711,500
Federal	\$3,947,725	\$0	\$0	\$3,947,725
State	\$103,888	\$0	\$0	\$103,888
Local	\$0	\$0	\$0	\$0
Private	\$130,888	\$3,638,000	\$2,918,000	\$6,686,888
Total	\$4,155,500	\$3,638,000	\$2,918,000	\$10,711,500
Sussex County Airport	\$41,925,000	\$6,770,000	\$6,770,000	\$55,465,000
Federal	\$39,828,725	\$0	\$0	\$39,828,750
State	\$1,048,125	\$0	\$0	\$1,048,125
Local	\$1,048,125	\$6,770,000	\$6,770,000	\$14,588,125
Private	\$0	\$0	\$0	\$0
Total	\$41,925,000	\$6,770,000	\$6,770,000	\$55,465,000
New Heliports	\$0	\$180,000	\$0	\$180,000
Federal	\$0	\$0	\$0	\$0
State	\$0	\$0	\$0	\$0
Local	\$0	\$180,000	\$0	\$180,000
Private	\$0	\$0	\$0	\$0
Total	\$0	\$180,000	\$0	\$180,000
Total SASP Funding Sources	\$79,088,168	\$24,044,166	\$23,816,666	\$126,949,000
Federal	\$74,962,760	\$8,611,432	\$8,801,432	\$92,375,624
State	\$1,972,704	\$314,117	\$231,617	\$2,518,438
Local	\$1,868,816	\$10,644,117	\$7,001,617	\$19,514,550
Private	\$283,888	\$4,474,500	\$7,782,000	\$12,540,388
Total	\$79,088,168	\$24,044,166	\$23,816,666	\$126,949,000

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.

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 95 percent Federal participation at publicly owned airports and most reliever airports (regardless of ownership). At New Castle, Delaware Airpark, Summit, 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.

It is important to note, that per Vision 100-Century of Aviation Reauthorization Act (the most recently expired funding authorization) stated: "The Secretary may decide that the costs of revenue producing aeronautical support facilities, including fuel farms and hangars, are allowable for an airport development project at a nonprimary airport if the Government's share of such costs is paid only with funds apportioned to the airport sponsor under section 47114 (d)(3)(A) (nonprimary entitlement) and if the Secretary determines that the sponsor has made adequate provision for financing airside needs of the airport."

The current Federal program has expired and new reauthorization legislation is expected to be enacted to fund the FAA's Airport Improvement Program (AIP) funding (as of 8/08). The AIP is currently used to fund the State Apportionment program which provides apportionment monies to states, based upon the size and population of each state relative to the entire country. The Administration sent a proposal to Congress in February 2007, which has been reviewed and modified by several committees and subcommittees in each house of Congress. Both the House and the Senate have released their own versions of an FAA reauthorization bill. Provisions being debated include the following:

- Extending current ticket and segment taxes. Both are taxes paid by passengers at the point of sale. This is a status quo approach, which ensures the burden for funding the air traffic system will remain disproportionately on the airlines and their passengers.
- Raise the tax on the use of international passengers from \$15.10 per arrival or departure to \$16.65.
- Increase the general aviation jet fuel tax from 21.8 cents to 35.9 per gallon. This increase is well below the levels proposed by the Administration and enables private jet owners to continue paying less than their fair share for the air traffic services they use.
- Introduce a \$58 per flight tax on fractional ownership. While not a true cost-based tax, fractionals would pay a fairer share for the services they use under this plan.

It is unclear whether a \$25 surcharge proposed by the Commerce Committee will be included in the

bill voted on by Congress.

In spite of uncertainty regarding AIP funding, even if authorization levels for the AIP decline in the future, the Federal government has been providing financial assistance for airport development since the Federal Airport Act of 1946. Thus, it is highly likely Federal funding assistance based upon eligibility requirements similar to those currently in force will be available throughout the planning period.

Of the capital improvements needed for the Delaware Recommended System Airports over the next 20 years, nearly \$92.4 million are eligible for Federal funding. Over the 20-year planning period, the total requirement averages about \$4.6 million annually. Based on the record of AIP apportionment and discretionary funding for Delaware airports, it is clear that this total is significantly larger than historical contributions of FAA to the State's airports. Therefore, two options exist for the implementation of the Recommended Plan - either increased FAA funding for Delaware is needed, or Delaware must find alternative sources of capital development monies. Strategies to achieve needed capital development funding are presented later in this Chapter.

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 impact 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 to implement the Recommended Aviation System Plan is approximately \$2.5 million over the 20 year period. However, additional funding is necessary for projects not included in the ACIP, such as eligible airport obstruction removal, possible property development rights acquisition, and planning services and equipment costs provided to the State's public-use airports. Together, ACIP and other eligible projects increase the level of State funding required to \$12.4 million through 2012. Appendix 8-B presents a breakdown of funding needs for these and other ACIP projects for the public-use airports in Delaware. This amount is considerably higher than the System Plan Recommendations and includes many non-system planning items taken from individual airport capital improvement plans.

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. These proposals are discussed later in this Chapter under the Legislation and Regulations section.

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. This sponsor share of the eligible project cost, not including those funds assumed to come from private enterprise, is as follows:

- 2.5 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.

Local sponsors of Delaware SASP airports have been identified as the source for \$22.8 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

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. For example, FAA has recently indicated that it may not be able to fund all of the proposed runway extension costs at Sussex County. Other funding cutbacks are likely for projects in the Recommended Aviation System. With this in mind, typical revenue sources at general aviation airports include:

¹ State funding procedures in this area are not precise.

- 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 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 project 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

Private enterprise funding is defined as the funding needed to support non-operational, revenue producing activities at the airport. Private enterprise projects are not eligible for Federal funding assistance, but some may be eligible for State funding. For the Delaware SASP, the development of conventional hangars and T-hangars fell into this category, in addition to non-public areas of terminal projects. A total of approximately \$12.5 million of investment is needed from private sources over the next 20 years.

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 private sources that can be identified. In the Delaware State Aviation System Plan, improvements at Chandelle Airport, Chorman Airport, Jenkins Airport, Laurel Airport, and Smyrna Airport fall under this category.

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

This section describes specific implementation methods for the Delaware SASP recommended for use by DelDOT and its Office of Aeronautics. 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:

- Contingency Plans
- Legislation and Regulations
- Continuing Planning Process

2.1 Contingency Plans

Development planning for airports requires careful consideration of the local implications of the airport location and type of facilities as well as the scheduling of development. In areas where implementation problems may occur, a set of contingency plans were developed to help the State respond to changing circumstances. In any type of planning where predictions of future activity are involved, there is a margin for error. This section describes a set of contingency plans that offer some flexibility to the State to implement the State Aviation System Plan.

Scenarios that concern changes to forecast demand were not enumerated here. There are a variety of reasons why the predicted levels of activity may or may not reach or exceed their forecasts. Economic recession, fuel price escalation, terrorist actions, and alternative energy development are some of the factors that could either increase or decrease the level of demand at system airports throughout the State. Differences between predicted and actual demand levels do not mean that the plan is flawed; rather, they indicate a need to adjust the timing of recommended improvements. For instance, if actual activity levels in 2010 are equal to those predicted for 2015, the recommended improvements should be accelerated by 5 years. Similarly, if actual levels are below forecasted demand, the recommended improvements should be delayed by the appropriate number of years.

There were a number of scenarios identified within the planning horizon. These scenarios are:

- Closure of Private Airports
- No New Public-Use Coastal Airport
- No Joint Use of Dover AFB
- No Public-Use Heliports in Coastal Sussex and New Castle Counties

Financial and facility recommendations of the plan are addressed under these scenarios, which makes the SASP relevant in the event that such scenarios occur.

Closure of Private Airports

The potential closure of private airports in Delaware was examined in detail in Alternative 3. In that alternative, it was assumed that 5 private airports, not including Summit Airport, would be closed by the year 2025 and that a public-use coastal airport would not be developed. An analysis of the impacts indicated significant differences, relative to the Recommended Aviation System. A summary of the differences would include the following:

	<u>Difference</u>
● Number of Airports in System	-6
● Private Enterprise Funding	-\$5,133,000
● Aviation Demand Accommodated	
- Based Aircraft	Same
- Operations	Same

The interpretation of these differences indicate that without the privately owned airports in the Recommended Aviation System, Delaware would have 6 fewer airports in its system. The cost difference is estimated to be \$5,133,000 without private airports. This estimate represents the loss of private investment at these airports, which is required to accommodate projected levels of demand.

No Public-Use Coastal Airport

Another potential scenario is one where West's Private Airport is not converted to a public-use facility. This scenario is a reasonable consideration, as there may be difficulty in securing local zoning approval for public-use designation of the airport. Even though the airport would remain privately owned, the perception of a public-use facility generates negative responses from area neighbors. Because the airport was not assigned any significant number of based aircraft, the lack of public-use designation will not impact the Recommended System in any significant manner. The airport's primary value was to increase the geographic coverage of aviation facilities in Sussex County.

Based on the size of West's Private Airport (3,000' X 65' turf runway), it is reasonable to expect that public-use of West's Private Airport to produce activity levels similar to Jenkins Airport by 2025. Therefore, approximately 5 based aircraft and up to 1,000 annual operations, assumed to be drawn from private-use airports and other out-of-state airports, would be "returned" without the conversion of West's to public-use. A summary of the differences would include the following:

	<u>Difference</u>
● Number of Airports in System	-1
● Cost of Converting to Public-Use	-N/A
● Aviation Demand Accommodated	

-	Based Aircraft	Same
-	Operations	Same

No Joint Use of Dover AFB

As discussed in Chapter 6 of this SASP, closure of Dover AFB to civilian use will displace corporate jet aircraft that regularly use the facility, such as the Gulfstream III, IV, and V. Under this scenario, demand for expansion of Delaware Airpark to accommodate these aircraft would exist. Needed facilities for the expansion would include the runway, taxiway, and associated infrastructure that would be expanded to ARC C-II standards. Based on survey responses, 72 percent of Civil Air Terminal users would use an alternative airport that met these standards.

While it could be presumed that these users would select Delaware Airpark, an analysis was undertaken to re-evaluate the original site selection findings that resulted in selection of Delaware Airpark as a critical part of a Central Delaware subsystem. The reconsideration of the 14 sites studied in 1996 arrived at the same conclusion, with Delaware Airpark remaining the best choice for a public-use airport in Kent County. Therefore, the next question to be considered was whether Delaware Airpark could be expanded to meet increased demand levels caused by the closure of Dover AFB to civilian use.

As discussed in Chapter 6, the examination of the location and constraints surrounding the existing airport site indicate that a 5,500 foot runway is physically possible without causing road relocations or other significant reconfiguration of existing infrastructure in the vicinity. Costs to expand the airport from a 4,200 foot runway length to a 5,500 foot runway length have been estimated to add more than \$9.2 million to the proposed development costs of \$14.9 million. In the event this occurs, Delaware Airpark would have to accommodate an additional 1,010 operations by business jet aircraft. A summary of the differences would include the following:

	<u>Difference</u>
● Number of Airports in System	-1
● Public Funding	+\$9,245,800
● Aviation Demand Accommodated	
- Based Aircraft	Same
- Operations	Same

No Public-Use Heliports in Coastal Sussex and New Castle Counties

The use of heliports in Delaware is growing, with activity trends shifting between facilities throughout the State. For example, four heliports (Barcroft Company, Delmar Ford, Strawbridge Christiana Mall, and Wilmington Country Club) are no longer in use, while four other facilities in clusters around New Castle and Dover have emerged. These facilities are Delaware State Police (Bridgeville), BeeBe Hospital, BeeBe Medical Center (Millville), and Nanticoke Health Services.

Sussex and New Castle Counties' heliports are hospital heliports, which are closed to public use. Need for facilities in this area has surfaced, as reports indicate that private helicopter owners

use non-designated landing sites to transfer passengers visiting second-homes. This activity spikes during Dover Downs race weekends. The largest downside to not developing 3 new public-use heliports in Sussex and New Castle Counties is the continued use of non-designated sites, and safety-related issues. Additionally, such new facilities could provide well for State Police use, medevac transfer, evacuation points for public emergencies, or for homeland security purposes. A summary of the differences would include the following:

	<u>Difference</u>
● Number of Airports in System	-3
● Development Costs of Three Heliports	-\$180,000
● Aviation Demand Accommodated	
- Based Aircraft	Same
- Operations	-450

2.2 Legislation and Regulations

This SASP proposes a number of recommendations for legislative changes for State laws. These include 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 is discussed.

Recommendations for Changes to Existing Legislation

Many of these recommendations are made to update the law to reflect the current administrative structure and response to various responsibilities. Appendix 8-A presents the proposed revisions to the sections from Title 2, Transportation, of the Delaware Code. 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 are presented in Appendix 8-B. These recommendations were brought forward by the Delaware Aviation Advisory Committee 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 \$2 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 three 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 2008, the State purchased two acoustical aircraft counting devices and began an airport traffic counting program to verify 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 Committee:** This committee has reviewed all aspects of 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 Statewide General Aviation Security Plan and the review of safety initiatives at private-use airports. Other aviation issues can be vetted through this committee as they arise.
- **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.

In Delaware, the most critical issues in terms of aviation planning included the following:

- How will the next Reauthorization bill and AIP funding provide for Delaware airport facility needs?
- How will operational activity counts affect long-range system planning efforts and the SASP?
- How would the closure of private airports affect need for facilities at other airports?
- Will capacity expansion be provided for New Castle Airport?
- Can local airport sponsors raise the needed capital to pay their share of the

recommended aviation system?

- Will a dedicated aviation trust fund be established in the future to help pay for needed aviation system improvements?

Answers to these questions will shape the aviation system in Delaware through the year 2025.

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 8-2. 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 8-2 - 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. (Only New Castle Airport is forecast to exceed 80% of its runway capacity by the year 2025.)
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 public-use coastal airport	Either when local zoning approval is gained for West's Airport, or when local public sponsor support for a new airport is gained.
Develop public-use heliports in Sussex and New Castle Counties.	When local sponsor is found for these projects.

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: Proposed Legislative Changes

APPENDIX 8-A

§ 133. Reports to federal agencies; preservation of aircraft involved in accidents.

The Federal Aviation Administration has primary responsibility for investigating aircraft accidents. Initial reports of accidents may be directed by state and/or local police agencies that report such aeronautical accident information to the Department through the Office of Aeronautics. The Office of Aeronautics shall report to the appropriate federal agency all aeronautical accidents of which it is informed and shall cooperate with and assist federal agencies in the conduct of any investigation. Police agencies involved in any accident investigation shall preserve, protect and prevent removal of component parts of any aircraft involved in an accident until the investigating agency or Office of Aeronautics gives clearance for removal of the wreckage. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 6 (2); 2 Del. C. 1953, § 133; 57 Del. Laws, c. 671, § 11D; 70 Del. Laws, c. 575, § 3.)

This section, while not changed in the law, should initiate a Memorandum of Agreement (MOA) between the Office of Aeronautics and the Delaware Transportation Management Center. The MOA should designate the TMC as the authorized representative of the Office of Aeronautics to coordinate the response to aircraft accidents in the State. The TMC already has Standard Operating Procedures in place to deal with aircraft accidents with the Delaware State Police and 911 response centers. Those need to be formalized in an MOA, relieving the Aeronautics Administrator of the direct responsibility set forth in this section of the law.

§ 170. Operation of airport, landing area, etc. without license; approval of site required before acquisition.

(a) All proposed airports, restricted landing areas, and other air navigation facilities shall be first licensed by the Department before they, or any of them, shall be used or operated.

(b) Any political subdivision or person acquiring property for the purpose of constructing or establishing an airport or restricted landing area shall, prior to the acquisition, make application to the Department for a certificate of approval of the site selected and the general purpose or purposes for which the property is to be acquired, to insure that the property and its use shall conform to minimum standards of safety and shall serve public interest.

(c) No political subdivision or officer or employer thereof, or person, shall operate an airport, restricted landing area, or other air navigation facility unless an annual license therefor has been issued by the Department. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9 (6); 2 Del. C. 1953, § 170; 57 Del. Laws, c. 671, § 11D.)

§ 173. Exceptions from approval and licensing requirements.

Sections 170 through 172 inclusive of this title shall not apply to restricted landing areas designed for personal use or to any airport, restricted landing area or other air navigation facility owned or operated by the federal government within this State. (Code 1935, c. 167; 45 Del. Laws, c. 301, § 9(9), (11); 2 Del. C. 1953, § 173.)

The key words in both of these sections are “restricted landing areas.” That can refer to heliports and helipads, which are currently not licensed by the State. Thus, in Section 173, it is recommended

the phrase “restricted use heliports and helipads” be added to the sentence.

§ 602. Erection or maintenance of obstructions; prohibitions.

(a) A building permit issued by the county or municipality having land use jurisdiction, after review and approval as provided herein, shall be required for the construction, erection, placement or alteration of any smokestack, tree, silo, flagpole, elevated tank, power line, radio or television tower, antenna, building, structure or other improvement to real property which meets any of the following conditions:

(1) Is greater than 200 feet in height above ground level;

(2) Is greater in height than an imaginary trapezoidal shape, beginning at the end of a runway of a public use airport, at an initial width of 50 feet, and extending outward and upward at a slope of 100:1 for a distance of 20,000 feet, to a width of 3,000 feet at its ending point;

(3) Is located within the runway approach area of each public use airport in the State; or

(4) Otherwise constitutes an obstruction as defined in this title or acts as an obstruction to the operation of aircraft as those terms are defined by Federal Aviation Regulation (FAR) Part 77.

(b) Such building permit for each such object or structure will not be issued until such time as the Department of Transportation through the Office of Aeronautics has reviewed and approved the application. The Department of Transportation, through the Office of Aeronautics, shall respond to the county or municipality having land use jurisdiction regarding any objections it has to the issuance of a building permit within 30 days of receipt of such permit for review.

(c) In order to provide safe aircraft approach areas to airport runways, the Department may, after notice and a hearing, enter upon any lands or improvements located thereon which are situated in said airport approach areas and may remove obstructions to aviation. Owners of obstructions that were erected prior to the enactment of or in compliance with this chapter are entitled to compensation for the removed obstruction and/or any damages incurred in the removal thereof from funds applicable to aeronautics and administered by the Office of Aeronautics. The process for condemnation of real property or improvements thereon under this chapter as required by applicable law and constitutional provisions shall be governed by the procedures set forth in Chapter 61 of Title 10 and Chapter 95 of Title 29.

(d) In order to ensure that new structures are not erected that pose potential obstruction hazards, it shall be unlawful to erect any new structure or add to any existing structure if such structure is thereby made to extend more than 200 feet above ground level at its site without giving prior notice to and obtaining prior approval from the Department. (70 Del. Laws, c. 575, § 17.)

Sections (a)(2) and (a)(3) are recommended to be deleted from this portion of the law. These are confusing and do not conform to the FAR Part 77 criteria. In this regard, the State’s criteria should be the same as the federal criteria. Thus, Section (a)(4) should read: “(2) Constitutes an obstruction as defined by Federal Aviation Regulations (FAR) Part 77.”

Appendix 8-B: Legislative Initiatives

Appendix 8-B - Legislative Initiatives

The purpose of this Appendix is to present potential initiatives for increasing revenues to Delaware Aeronautics. Whereas there are an increasing number of financial commitments that DelDOT has toward aeronautics, there need to be associated increases in revenue to cover these expenses. State programs that rely upon DelDOT budgeting include the following:

- Airport Capital Improvement Program matching grants at eligible airports
- Obstruction removal programs at privately owned, public-use airports
- Airport licensing
- Public-use airport assistance - wind socks, weather stations, runway/taxiway lights, turf runway rolling
- Potential development rights purchasing at airports
- Building permit review

These and other services are funded by DelDOT each year. There are more needs than resources as documented in Section 1.

1. **HISTORICAL AND PROJECTED FUNDING NEEDS**

DelDOT has contributed significant funding to aviation over the past several years. Not counting the planning or equipment costs, DelDOT has provided the State share match for the FAA’s Airport Improvement Program (AIP) for Delaware Airpark, Sussex County, and New Castle Airports. From 2003 to 2006, the matching funds for these three airports has totaled over \$900,000 (Table 8-B-1):

Table 8-B-1 - Historical DelDOT ACIP Matching Funding				
Year	Delaware Airpark	Sussex County Airport	New Castle Airport	Yearly DelDOT Totals
2003	NA	\$10,883	\$222,222	\$233,105
2004	\$59,693	\$49,534	\$69,734	\$178,961
2005	\$94,737	\$14,917	\$103,316	\$212,970
2006	\$211,219	\$17,752	\$51,238	\$280,209
TOTALS	\$365,649	\$93,086	\$446,510	\$905,245

For the future, there is a significant need for airport capital improvement funding. For just the projects that we know of now, the State match alone totals roughly \$4.16 million as shown in Table 8-B-2. On an annual basis, the average needed funding for ACIP matches exceeds \$616,000.

Table 8-B-2 - Projected ACIP State Funding Requirements				
Year	Delaware Airpark	Sussex County Airport	New Castle Airport	Yearly DelDOT Totals
2007	N/A	\$116,100	\$154,722	\$270,822
2008	\$3,947	\$27,777	\$505,555	\$537,279
2009	\$33,333	\$319,333	\$397,000	\$749,666
2010	\$333,000	\$422,000	\$86,000	\$841,000
2011	\$416,666	\$369,000	\$613,885	\$1,399,551
2012	\$73,600	\$105,555	\$181,940	\$361,095
TOTALS	\$860,546	\$1,359,765	\$1,939,102	\$4,159,413

Added to these costs would be eligible airport obstruction removal costs, possible property development rights acquisition, and planning services and equipment costs provided to the State's public-use airports.

Airport development rights purchases may need to be made to preserve the State's existing airport system. For example, the system plan has identified Laurel Airport as a potentially important landing site for the State's airport service area geographic coverage. Figure 8-B-1 shows the airport's 88 acre property that may need future protection from development to other land uses. It is estimated that at least \$7.5 million will be needed between now and 2012 for the purchase of development rights at system airports.



Figure 8-B-1 - Potential Development Rights Purchase

O b s t r u c t i o n
 removal costs could run as high as \$430,000 over period. Finally, the cost to provide services to airports including lighting, wind socks, weather stations, and planning assistance is estimated to cost roughly \$50,000 per year. Table 8-B-3 lists these costs.

Table 8-B-3 - Estimated Financial Requirements				
Year	Operations/Planning	Obstruction Removal	Development Rights	Yearly Totals
2007	\$50,000	\$30,000	\$0	\$80,000
2008	\$50,000	\$100,000	\$1,500,000	\$1,650,000
2009	\$50,000	\$100,000	\$1,500,000	\$1,650,000
2010	\$50,000	\$100,000	\$1,500,000	\$1,650,000
2011	\$50,000	\$50,000	\$1,500,000	\$1,600,000
2012	\$50,000	\$50,000	\$1,500,000	\$1,600,000
TOTALS	\$300,000	\$430,000	\$7,500,000	\$8,230,000

Taken together, DelDOT Aeronautics could face financial needs of almost \$12.4 million between now and the year 2012. These costs by year total:

- 2007 - \$350,822
- 2008 - \$2,187,300
- 2009 - \$2,399,700
- 2010 - \$2,491,000
- 2011 - \$2,999,600
- 2012 - \$1,961,100
- TOTAL \$12,389,400**

As a result of these funding needs, innovative methods of funding these programs must be developed. Two such initiatives have included potential revenues from the following:

- Fuel Taxes
- Aircraft Registration Fees

Descriptions of these potential revenue sources are provided below.

2. FUEL TAXES

In order to estimate revenues from fuel taxes, DelDOT needs to know the approximate volume of fuel sales to estimate the value of a tax on jet fuel sales. In this regard, calls to airports selling jet fuel resulted in the following data for 2006:

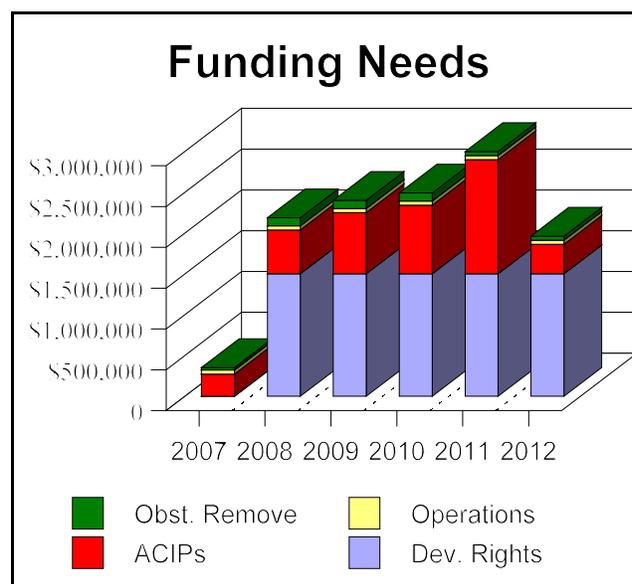


Figure 8-B-2 - DelDOT Aeronautics Funding Needs

● New Castle Airport	4,931,600 gallons
● Summit Airport	159,600 gallons
● Sussex County Airport	218,300 gallons
● Delaware Airpark	0 gallons
● Chorman	46,000 gallons
● Laurel	20,500 gallons
● Civil Air Terminal	<u>0 gallons</u>
Total	5,376,000 gallons

A 5 cent tax results in \$268,800. From the summary, it can be seen that New Castle Airport is most heavily impacted by a potential jet fuel tax.

Avgas taxes collected in Delaware are recorded by the State to include the following totals for FY 2006:

● Total Avgas Sold	1,108,406 gallons
● Total Avgas Refunded	<u>174,406 gallons</u>
Total Avgas Subject to Tax (2006)	934,000 gallons

Net revenue collected for avgas in 2006: 24 cents per gallon times 934,000 gallons = \$224,160. No changes are recommended for this tax. Together, the jet fuel tax (\$0.05/gallon) and avgas tax (\$0.24/gallon) would yield about \$493,000 per year (say \$500,000) to the aviation program in Delaware.

3. AIRCRAFT REGISTRATION FEES

Proposals have been made to initiate aircraft registration fees in Delaware. These fees would exempt aircraft domiciled in the State, but would charge nominal fees to out-of-state registered aircraft owners. Reasoning behind the exemptions include the fact that aircraft based within the State already pay fuel taxes and support Delaware airport employment (aircraft maintenance) and operation (aircraft storage fees).

Table 8-B-4 presents a summary of based and registered aircraft totals in Delaware, by aircraft type. As shown, there are 627 based aircraft in the State and 12,572 registered aircraft. Many of these registered aircraft are with holding companies and trusts, including large institutions such as Wilmington Trust and Wachovia Bank. These companies hold the title to many leased aircraft and act as trustees for those aircraft. Because aircraft registrations are with the federal government, the State of Delaware receives no compensation for these registrations.

Proposals of a tiered registration fee system have been made that keep costs to registered aircraft owners at levels that relate directly to the size and sophistication of their aircraft. In this regard, a small, single engine aircraft should not pay the same amount as a four-engine B-747. To keep the system simple, the following annual registration fee structure was suggested:

- Single engine aircraft \$50
- Multi-engine aircraft \$100
- Jet aircraft \$500
- Helicopters \$100
- Other (gliders, balloons, etc.) \$50

Table 8-B-4 - Based & Registered Aircraft in Delaware							
Airport	Single-Engine	Multi-Engine	Jet	Rotor	Military	Other	Total
Based Aircraft							
Chandelle Estates	22	2					24
Chorman	17	2					19
Civil Air Terminal							
Delaware Airpark	43	2		1			46
Jenkins	18	1				1	20
New Castle	167	24	66	16	9		282
Smyrna	6						6
Summit	90	5	1	7			103
Sussex county	35	5	4	2		1	47
Western Sussex	13	1					14
DelDot Helistop							
Private-Use Facilities	48	8	1	6		3	66
Total Based Aircraft	459	50	72	32	9	5	627
Registered Aircraft							
Kent County	789	283	108	64	0	14	1,258
Sussex County	346	73	18	46	0	17	500
New Castle	6,238	2,291	1,593	551	0	141	10,814
Total Registered Aircraft	7,373	2,647	1,719	661	0	172	12,572
Aircraft Subject to Fees	6,914	2,597	1,647	629	0	167	11,945

Using the information in Table 8-B-4 along with this fee structure, the following revenue totals could be projected:

● Single engine aircraft	\$345,700
● Multi-engine aircraft	\$259,700
● Jet aircraft	\$823,500
● Helicopters	\$ 62,900
● Other (gliders, balloons, etc.)	<u>\$ 8,350</u>
TOTAL FEES	\$1,468,700

As shown, roughly \$1.5 million could be generated through registration fees for aircraft registered but not based in Delaware. Of course, this assumes everyone will pay and that there will be no collection problems.

4. COLLECTION METHODS

Collection methods for the fuel taxes are already in place. No changes would be required. However, the collection process for the registered aircraft would have to be developed. In this regard, all of the registered aircraft being taxed are located out of Delaware. Therefore, property liens are not particularly effective. For some of the larger trustees or holding companies for aircraft registrations, the process will be somewhat easier for the State in that these companies must pay the amount and then collect from their lessees. For “paper” corporations - those with an address in Delaware but no staff - it may be more difficult to track down and collect these fees. To ensure the highest level of collection, the proposed legislation will have to include appropriate penalties for non-payment and late payments. A separate State registration may be required to address this issue.

5. OTHER STATES

For comparative purposes and to see if new taxes would drive Delaware aircraft to other states, an examination of aviation fuel taxes and aircraft registration fee structures was undertaken. In other surrounding states, fuel taxes are used to raise revenue for aviation programs:

- PA - State tax of 2.0 cents/gallon on jet fuel
- MD - State tax of 7.0 cents on avgas and jet fuel.
- NJ - State tax of 2.0 cents/gallon on jet fuel
- VA - State tax of 5.0 cents on jet fuel up to 100,000 gallons. Break for eligible operators after 100,000 - \$0.005 cents/gallon.

Aircraft registration fees are charged in 26 states. These fees can range from as little as \$10 per aircraft to \$15,000 (Oklahoma registration fee for large jet). Most of these state programs require that aircraft owners register their aircraft within their state. Notably, the following states do not have either registration fees or personal property taxes on aircraft: Colorado, Delaware, Florida, Maryland, New Jersey, New York, Pennsylvania, and Vermont. Some states charge \$15 per seat (Ohio), while others charge a percentage of the fair market value of the aircraft (Minnesota, Arizona, Iowa). Other states use the weight of the aircraft (Connecticut, Idaho, Indiana, Massachusetts, Mississippi, Montana, New Mexico, North Dakota, Rhode Island, South Dakota, and Wisconsin).

6. SUMMARY AND FINDINGS

In summary, it can be stated that there is a large aviation funding requirement for DelDOT quantified between now and the year 2012. Current estimates show an average of about \$2,065,000 per year, totaling \$12.4 million by 2012. To fund these and other projected costs, two primary methods were examined. In this regard, the institution of fees on aviation interests can produce revenue in support of aviation projects. To gain the support of the aviation community, this new revenue should be dedicated to support of the aviation system. It can be estimated that the following revenue totals could be generated annually:

- Fuel Taxes: \$500,000
- Registration Fees : \$1,493,000
- Totals \$1,993,000

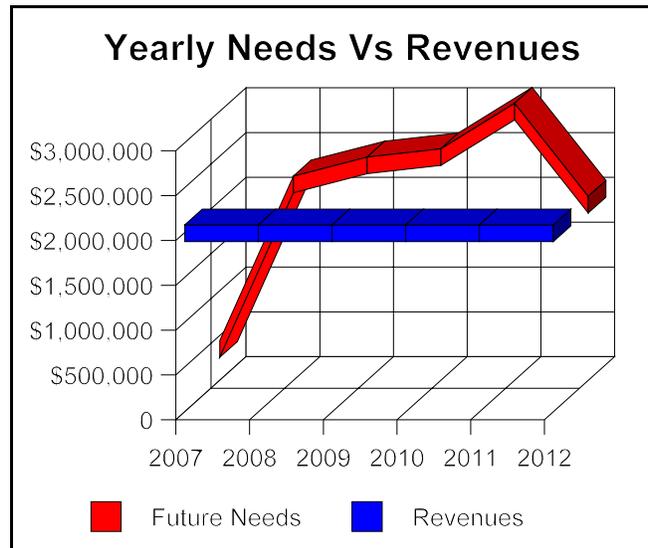


Figure 3 - Future Needs Vs Revenues

Between now and 2012, these revenues would total \$9,965,000 - roughly \$2.4 million short of the needed funding. However, this total is roughly \$1.7 million more than is currently collected through current fuel taxes. In order to move forward on these proposals, policy decisions must be made regarding their viability. Once approved, collection methods will be needed for registered aircraft (the fuel tax is already in place). This may require the establishment of a State registration process for federally registered aircraft in Delaware.

Sample Legislation
144th GENERAL ASSEMBLY
_____ BILL NO. _____

AN ACT TO AMEND CHAPTERS 1 AND 6, TITLE 2 OF THE DELAWARE CODE RELATING TO AVIATION.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE DELAWARE (three-fifths of the members elected to each house thereof concurring therein):

Section 1. Amend Subchapter III, Chapter 1, title 2 of the Delaware Code by creating the following sections 165 through 169, to read as follows:

“Section 165. State Aircraft Registration Certificates; Exemptions.

- (1) The Department is empowered to issue aircraft registration certificates, and to establish the rules and regulations setting forth the requirements for and the terms, conditions, and limitations of such certificates. All persons owning aircraft required to be registered with the Federal Aviation Administration under the Federal Aviation Act (49 U.S.C. 1401et seq.), which aircraft are registered using a Delaware address for such purposes, shall also register with the Department, as required by this subchapter. As used herein, “person” or “persons” shall have the same definition as described in Section 302 of title 1 of this Code.
- (2) The effective dates for state aircraft registration certificates shall be the first day of the month and continue through the last day of the following twelfth month and shall be based upon the first numeral of the aircraft federal registration mark or N number so that registration for aircraft with N numbers beginning with the numeral 1 shall become effective on January 1 of a year and end December 31 of the same year and aircraft with N numbers beginning with the numeral 2 shall become effective on February 1 of a year and end January 31 of the subsequent year and so forth.
- (3) A state registration certificate shall normally remain in force for one year following the date of its issue, unless it is an aircraft registered out of cycle, in which case subsection (4) of this section shall apply.
- (4) Aircraft registration fees shall be prorated for shorter or longer periods. If an original aircraft registration is issued in one of the next 3 months preceding and including the month corresponding to the first numeral of the aircraft N number, the registration shall expire on the last day of the second anniversary of the month corresponding to the first numeral of the aircraft N number.
- (5) No provision of this subchapter relating to aircraft registration by the Department shall be so construed as to require:
 - (a) The registration of nonresident aircraft, unless the federal registration for such aircraft uses a Delaware address.
 - (b) The registration of an aircraft which has been licensed by a foreign country with which the United States has a reciprocal agreement covering the operations of such

licensed aircraft, provided that such an operation does not constitute an act of air commerce.

(c) The registration of an aircraft which is owned by a nonresident of this state who is lawfully entitled to operate such aircraft in the state, district or country of his or her residence, provided that said state, district or country grants like privileges to residents of this state.

(d) The registration of an aircraft owned by a resident of this state which aircraft is based in another state having state registration requirements, provided such aircraft shall be in fact registered in such other state, and provided such aircraft shall not be used commercially within this state and further provided that a registration waiver is obtained from the department.

(e) The registration of an aircraft owned by a resident of this state which is in an unflyable condition and which will remain in such condition throughout the registration year:

(1) If a request for waiver of registration for the aircraft is submitted in writing to the department; and

(2) If the Department finds the information in the request is sufficient justification for Department approval of a waiver of registration.

Section 166. Aircraft Title Transfer.

On the date of transfer of title of an aircraft registered with the Department, the owner in writing shall report the transaction to the Department, and shall surrender the registration certificate for said aircraft, properly executed as to transfer of title, to the purchaser. The purchaser may operate such aircraft in conformity with the terms of this certificate pending issuance of a registration certificate, provided that on the date of transfer of title the proper application form shall have been either mailed to the Department or delivered to its representative.

Section 167. Suspension or Revocation of Certificates; Appeals.

(1) The Department shall suspend or revoke a state registration certificate issued for an aircraft if the holder thereof makes any material false statement in an application for a certificate or in any report required by the Department.

(2) Revocation or suspension shall be only after notice and opportunity for hearing, provided that if any person takes an appeal from such determination, the Department may suspend the certificate of such person pending the appeal.

(3) Any person whose aircraft registration certificate has been suspended or revoked, or who has been denied such a certificate by the Department, or who has been assessed an administrative penalty or fine for violation of a provision of this chapter relating to aircraft registration shall have the right to file a petition, within 30 days thereafter, for a hearing in the matter with the Secretary. Any subsequent appeals to Superior Court shall be filed within 30 days of the day the notice of the decision was mailed. The appeal shall be on the record without a trial de novo. If the Court determines that the record is insufficient for its review,

it shall remand the case to the Secretary for further proceedings on the record. The Court, when factual determinations are at issue, shall take due account of the experience and specialized competence of the Department and of the purposes of the basic law under which the Department has acted. The Court's review, in the absence of actual fraud, shall be limited to a determination of whether the Department's decision was supported by substantial evidence on the record before the Department.

Section 168. Fees; rebates; exceptions.

The Department is hereby authorized to collect the following fees for the issuance of aircraft registration certificates and for rendering certain services.

- (1) For single engine aircraft, \$50.
- (2) For multi-engine aircraft, \$100.
- (3) For jet aircraft, \$500.
- (4) For helicopters, \$100.
- (5) For other aircraft , \$50.
- (6) For each transfer of an aircraft registration certificate from an aircraft sold or destroyed to another aircraft owned by the same person, \$10.
- (7) The Department may issue a certified copy of any certificate of registration or registration decal which may have been lost or mutilated, upon the written request of the person entitled to the certified copy and the payment of a fee of \$10.
- (8) If any person tenders a payment to the division in excess of the sum lawfully due, and the overpayment is less than \$5, the Department may, in its discretion, disregard the overpayment if the cost to the state to refund the overpayment would exceed the amount involved.
- (9) No aircraft registration fee shall be required:
 - (a) From any aircraft located in this state more than 90 days cumulatively each registration year. The Department may issue rebates of the aircraft registration fee to persons who qualify for this exception.
 - (b) For the registration of hot air balloons, whether or not a federal registration number has been assigned to the balloon; or
 - (c) For the registration of public aircraft.

Section 169. Deposit of aircraft registration proceeds.

All aircraft registration certificate fees and related revenues collected pursuant to this subchapter shall be deposited to the credit of the Transportation Trust Fund established in Title 2 of this Code, for the purpose of supporting the Department of Transportation's responsibilities for aviation in this State. Any rebates paid pursuant to this subchapter shall also payable from the Transportation Trust Fund."

Section 2. Amend Section 173, title 2 of the Delaware Code by inserting the phrase “restricted use heliports and helipads,” between the phrase “apply to” and the phrase “restricted landing areas” appearing therein.

Section 3. Amend Section 6029(a), title 2 of the Delaware Code by inserting the word “or” after subsection (1) thereof, and further by deleting subsections (2) and (3) thereof in their entirety, and further by deleting the word “otherwise” appearing in subsection (4) thereof, and further by renumbering subsection (4) as subsection (2).

Section 4. Effective date. Section 1 of this law shall take effect January 1, 2009, in order for the Department to prepare and adopt the implementing regulations for its enforcement and administration.

SYNOPSIS

This bill updates portions of the state’s aviation law in several respects. First, it creates an aircraft registration certificate program, with regulations to be adopted by the Department for implementation. The certificate fees and related revenues will support the Department’s aviation programs.

In addition, the bill exempts restricted use heliports and helipads from the state’s aviation licensure requirements. It also eliminates some existing statutory language relating to obstructions and building permits near public use airports, to eliminate conflicts between that language and current Federal regulations on the same subject, which remain in place.

AviationAmendments.doc
FHS/06/1608

Sample Legislation
144th GENERAL ASSEMBLY
_____ BILL NO. _____

AN ACT TO AMEND CHAPTER 51, TITLE 30 OF THE DELAWARE CODE RELATING TO TAXES ON AVIATION FUEL.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF DELAWARE DELAWARE (three-fifths of the members elected to each house thereof concurring therein):

Section 1. Amend Section 5120, title 30 of the Delaware Code by deleting the phrase “airplanes or aircrafts,” appearing in subsection (a)(1), thereof, and by creating a new subsection (a)(2) thereof, to read as follows:

“(2) gasoline used by any person for the purpose of operating airplanes or aircrafts for agricultural uses in this State. All other gasoline used for the purpose of operating airplanes or aircrafts shall be subject to the tax imposed on gasoline in this Chapter.”

Section 2. Further amend Chapter 51, title 30 of the Delaware Code by creating a new Subchapter IV. thereof, to read as follows:

“Subchapter IV. Aviation Jet Fuel.

Section 5145. As used in this subchapter:

(1) "Aviation jet fuel" means fuel designed for use in the operation of jet or turbo-prop aircraft, and sold or used for that purpose.

Section 5146. Aviation jet fuel tax.

(a) There is hereby levied and imposed a tax of 5 cents per gallon, computed in the same manner and subject to the same limitations, as the tax rate established for gasoline in § 5110 of this title, as amended, on the sale or delivery of aviation jet fuel to any aviation jet fuel supplier or aviation jet fuel user not the holder of a valid aviation jet fuel supplier's or aviation jet fuel user's license. Said tax, with respect to all aviation jet fuel delivered by an aviation jet fuel supplier into the bulk storage tank or tanks of said dealer or user, shall attach at the time of such delivery and shall be collected by the supplier from the dealer or user and shall be paid over to the Department of Transportation as hereinafter provided.

(b) There is hereby levied and imposed a tax of 5 cents per gallon, computed in the same manner and subject to the same limitations, as the tax rate established for gasoline in § 5110 of this title, as amended, on the use (within the meaning of the word "use" as defined in § 5131 of this title) of aviation jet fuel when such fuel is delivered into the supply tanks of jet or turbo-prop aircraft in this State by a licensed aviation jet fuel dealer or a licensed aviation jet fuel user. Said tax, with respect to all aviation jet fuel

delivered by a licensed aviation jet fuel dealer into supply tanks of jet or turbo-prop aircraft in this State, shall attach at the time of such delivery and shall be collected by such dealer from the aviation jet fuel user and shall be paid over to the Department of Transportation as hereinafter provided. Said tax, with respect to aviation jet fuel acquired by any licensed aviation jet fuel in any manner other than by delivery by a special fuel dealer into the supply tank of a motor vehicle, shall attach at the time of the use (as defined in § 5131 of this title) of such fuel and shall be paid over to the Department of Transportation by said user as herein provided.

Section 5146. Exemptions.

(a) The tax imposed by this chapter shall not apply to aviation jet fuel sold and delivered to and used by the following persons:

- (1) The United States or any governmental agencies thereof; and
- (2) The State and every political subdivision thereof.

Section 5147. Administration.

(a) Rules and regulations. -- The Department of Transportation shall enforce this subchapter, and may prescribe, adopt and enforce reasonable rules and regulations relating to the administration and enforcement thereof.

(b) Examination of records. -- The Department of Transportation may examine the records of aviation jet fuel dealers, aviation jet fuel users, aviation jet fuel suppliers and make such other investigations as it may deem necessary in the administration and enforcement of this subchapter.

(c) Presumption. -- For the purpose of enforcing this chapter, it shall be prima facie presumed that all aviation jet fuel received by any person into storage having dispensing equipment designed to fuel jet or turbo-prop aircraft in this State is to be transferred or delivered by that person into the fuel supply tanks of said aircraft.

(d) Reciprocal exchange of data. -- The Department of Transportation shall, upon request from the officials to whom are entrusted the enforcement of the aviation jet fuel tax law of any other state, the District of Columbia, the United States, its territories and possessions, the provinces or the Dominion of Canada, forward to such officials any information which it may have relative to the receipt, storage, delivery, sale, use or other disposition of aviation jet fuel by any aviation jet fuel dealer or aviation jet fuel user; provided such other state or states furnish like information to this State.

(e) Records open to public. -- Reports required by this chapter, exclusive of schedules, itemized statements and other supporting evidence annexed thereto, shall at all reasonable times be open to the public.

Section 5148. Deposit of aviation jet fuel tax proceeds.

All aviation jet fuel taxes collected pursuant to this subchapter shall be deposited to the credit of the Transportation Trust Fund established in Title 2 of this Code, for the purpose of supporting the Department of Transportation's responsibilities for aviation in this State."

Section 3. Effective date. This law shall take effect January 1, 2009, in order for the Department to prepare and adopt the implementing regulations for its enforcement and administration.

SYNOPSIS

The Department of Transportation uses Transportation Trust Fund revenue to support a wide variety of aviation needs throughout the state. However, very little of the revenue used for this purpose is generated directly from aviation.

This bill amends the current state law regarding aviation gasoline taxation. In lieu of the current refund option for all such aviation fuel used to operate airplanes or aircrafts, the refund would be limited to those instances where the aviation gasoline is used for agricultural purposes.

The bill also creates a new tax on aviation jet fuel of 5 cents per gallon. Nearby states already impose this tax.

The tax proceeds are to be deposited into the Transportation Trust Fund, and will be used to offset the costs of the Department's efforts to assist aviation needs in the state.

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