Chapter One
INTRODUCTION AND INVENTORY OF EXISTING CONDITIONS

A. INTRODUCTION

The Airport Master Plan, with its Airport Layout Plan, is the centerpiece for airport planning at the local level that addresses the development needs of an individual airport during a typical 20-year planning period. Updates are often necessary for the airport to remain in step with economic realities or changing technical and political conditions and the FAA recommends general aviation airports should update their plans each ten years. Several key factors influence airport capital development needs to achieve full productivity for the aircraft using the airport. The most notable factors are growth in aviation activity and meeting FAA recommended design standards. These two factors typically represent two-thirds of the estimated projects eligible for federal grants. Three other factors; 1) the reconstruction of existing infrastructure that is beyond its useful life, 2) upgrades to the existing infrastructure to prepare airport facilities to accommodate the introduction of different aircraft, and 3) addressing safety, security and environmental concerns, account for the remainder of the eligible development projects.

The purpose of the Master Plan and Airport Layout Plan (ALP) for the Sussex County Airport is to provide the Sussex County Council and County staff with useful, understandable information and guidance to develop and maintain a safe and efficient airport. The ALP provides the Federal Aviation Administration (FAA) and the Delaware Department of Transportation (DelDOT) with information concerning the planned development at the Sussex County Airport. The project was financed jointly by the FAA, DelDOT and Sussex County. The Inventory chapter of this report provides information pertaining to the airport history and description of existing airport facilities, and is based on conditions and records as they existed during April 2002.

The Sussex County Council and staff find it necessary at this time to consider the extension of Runway 4-22 to accommodate existing and future aviation demand. The demand is directly related to current tenants and itinerant users increased operational activity by medium sized business jets, such as the Hawker HS125 or Gulfstream III, as well as the Boeing Business Jet

(B-737-700 family). In addition to the evaluation of a potential runway extension, a 1999 preliminary study of crosswind runway needs recommended that Runway 10-28 should be reopened to serve aircraft up to ARC B-II category, and the existing crosswind Runway 13-31 should be converted to use as a taxiway. Neither of these projects is reflected on the current approved ALP, and as such are not eligible for federal funding.

The Master Plan will evaluate the runway length and pavement strength required to serve the critical aircraft defined for both the primary and crosswind runways, based on standard FAA design criteria. Consideration will be given to three alternative development concepts that will result in a preferred operational alternative. The preferred operational alternative will then become the basis for the ALP update.

B. GENERAL INFORMATION

1. Airport Location & Management

The Sussex County Airport is located in south-central Delaware approximately one mile east of the city of Georgetown and 15 miles inland from the Atlantic Ocean. The airport is operated by Sussex County and is under the direction of the Sussex County Engineering Department, with many business related matters handled by the Department of Economic Development. Airport property consists of approximately 615 acres, including 178 acres that comprises the Industrial Air Park. Sussex County owns the property and acts as grant sponsor for FAA funded airport improvement projects. **Exhibit 1-1**, Airport Location Map, locates the airport relative to the State of Delaware and the eastern seaboard. **Exhibit 1-2**, Airport Vicinity Map, identifies the immediate vicinity around the airport.

Exhibit 1-1
Location Map

Exhibit 1-2
Vicinity Map

2. Airport History

During 1940, the Civil Aeronautics Administration (CAA) was working a plan to develop 250 airports nationwide and Georgetown, Delaware was ranked number 69 on the priority list. World War II brought increased military activity to Delaware because of the importance of harbors within the Delaware Bay and River areas. Airfields and fortifications within Sussex County were built during the war, including the Georgetown Airport. Construction was completed in 1943 and as typical of military airfields constructed during this era, the development included three runways, each 5000 feet long and 150 wide with taxiways paved to a width of 50 feet. Although the CAA built the airfield for the Army Air Corp, the Army's need for the airfield diminished, resulting in the completed facility being assigned to the Wildwood Naval Air Station. The airfield was used by the Navy to practice aircraft carrier landings and test catapult launching equipment and operations.

After the war, military facilities within Sussex County were largely abandoned. The Navy relinquished control of the Georgetown Airport and the Federal Government declared it surplus. Sussex County assumed responsibility of operating and maintaining the field and it has operated as a civilian airfield since that time. Although a U.S. Mail route stop was established at the Georgetown Airport until 1949, the field never developed substantial civilian aircraft traffic. The airfield was used as a test facility for All American Engineering during the 1950s and 1960s, involving aerial retrieval and launching devices, as well as a rocket powered car, but the main focus of the tests remained arresting gears and catapults for aircraft carriers. This period of the airport's history came to a close in 1966 with a turbine powered catapult, rail guided test tracks and other facilities being relocated from the airport to a Navy facility in New Jersey.

During the mid-1970s, Sussex County pursued a revival of the airport by building roads, sewer and water lines, and drainage features along the northeastern side of the airport to support an industrial park. Over the years, two of the three original runways were closed.

Runway 10-28 was closed after removal of the catapult test equipment and is currently leased to a private firm as storage area for decommissioned military aircraft. Runway 16-34 was closed and a portion of it converted to use as a taxiway (Taxiway 'C') and the remainder provides access to major tenant hangars, as well as the Industrial Air Park. One of the original taxiways through the center of the airport was converted to use as crosswind Runway 13-31 and it remains in use today.

3. Airport Role

Sussex County Airport is a general aviation airport serving a broad business and personal aviation community. The airport currently has 55 based aircraft and serves approximately 47,000 civilian and military aircraft operations annually. These operations include single-engine and twin-engine aircraft used for business, pleasure and flight training, as well as significant jet traffic including Boeing Business Jets (BBJ). Sussex County Airport is one of only two public use airports in Sussex County and the only publicly owned airport in the County. The Delaware Aviation System Plan Update (DASPU) defines a service area for the airport that extends into Kent County to the north and across the state line into Maryland to the south.

The FAA is required to publish the National Plan of Integrated Airport Systems (NPIAS) as mandated by the Airport and Airways Improvement Act of 1982. This FAA planning document is updated each two years and is intended to identify the nation's airport needs over a ten year planning period, representing a continuous planning effort. Likewise, the DASPU identifies the state's airport needs. The most recent update to the state plan was published in two technical reports, Phase I in 1996 and Phase II in 1998. The Update forecasts the state's aviation needs for the period 1995-2015.

Airports contained in the NPIAS are categorized by their role. The role reflects one of five basic airport service levels which describe the type of service that the airport is expected to provide to the community at the end of the five year planning period. The

service level also represents funding categories for the distribution of federal aid. The five basic service levels include:

a. Commercial Service - Primary
b. Commercial Service – Non-primary
c. Commercial Service which also serves as a reliever
d. Reliever Airport
e. General Aviation Airport

In addition to defining the role of the airport, the FAA has a system to correlate airport design criteria to the operating (approach speed) and physical (wingspan) characteristics of the most demanding aircraft currently using or expected to use an airport with greater than 500 annual operations. This airport classification system is contained in FAA Advisory Circular (AC) 150/5300-13, Airport Design. The Airport Reference Code (ARC) system is comprised of two components. The first component, depicted by a letter (A-E), designates the aircraft approach category, determined by approach speed. The second component, depicted by a roman numeral (I-VI), designates the airplane design group, determined by the wingspan. **Table 1-1** identifies the Aircraft Approach Categories and Aircraft Design Groups that have been established by the FAA.

The NPIAS and the DASPU list Sussex County Airport as a general aviation airport. The airport reference code as listed on the currently approved Airport Layout Plan (ALP) is B-II. Examples of aircraft that may typically operate at a B-II airport and their respective airport reference code classifications are listed in **Table 1-2.**

Table 1-1
Sussex County Airport
Approach Categories and Design Groups

Approach Category	Aircraft Design Group
A - Less than 90 knots	I - Wing span less than 48 feet
B - 91 to 120 knots	II - Wing span 49 feet to 78 feet
C - 121 to 140 knots	III - Wing span 79 feet to 117 feet
D - 141 to 165 knots	IV - Wing span 118 feet 170 feet
E - Greater than 165 knots	V - Wing span 171 feet to 196 feet VI - Wing span 197 feet to 262 feet

Source: FAA AC 150/5300-13, Airport Design

Table 1-2
Sussex County Airport
Typical Aircraft

Aircraft	ARC	Approach Speed (Knots)	Wing Span (ft.)	Max Takeoff Weight (lbs.)
Cessna 150	A-I	55	33	1,600
Cessna 172	A-I	61	36	2,658
Beech Bonanza F33A	A-I	70	34	3,400
Piper Navajo	B-I	100	41	6,200
Beech Baron 58P	B-I	101	38	6,200
Cessna Citation I	B-I	108	47	11,850
Cessna Conquest 441	B-II	100	50	9,925
Beech King Air B200	B-II	103	55	12,500
Cessna Citation II	B-II	108	52	13,300
Dassault Falcon 20	B-II	107	54	28,660
HS-125 Series 700	C-I	125	47	24,200
Gates Learjet 55	C-I	128	44	21,500
Canadair 601	C-II	125	62	41,250
Grumman G-III	C-II	136	78	68,700
Boeing B-737 (BBJ)	C-III	140	95	171,000
Boeing B-727-200	C-III	138	108	209,500

Sources: FAA AC 150/5300-13, Airport Design
Delta Airport Consultants, Inc. Analysis

C. AIRFIELD CONFIGURATION/INFRASTRUCTURE

The existing runway and taxiway system at Sussex County Airport is shown in **Exhibit 1–3.**

1. Runway System

The Sussex County Airport has a primary runway (4-22) and a crosswind runway (13-31). Runway 4-22 is 5,000 feet long and 150 feet wide. Runway 13-31 is 2,330 feet long and 50 feet wide. **Table 1-3** presents an inventory of the runway system.

Table 1-3
Sussex County Airport
Runway Data

	Runway 4-22	Runway 13-31
Length	5,000'	2,330'
Width	150'	50'
Displaced Threshold	None	None
Elevation	49' MSL	49' MSL
Lighting	MIRL	MIRL
Marking	Non-precision instrument (NPI)	Visual
Instrumentation	PAPI, REIL	None
ARC	B-II	A-I (Small)

Source: Delta Airport Consultants, Inc.

Exhibit 1-3

2. Wind Analysis

The orientation of the runway to the prevailing wind direction is critical to the safe operation of aircraft, especially small, single engine aircraft which are more susceptible to crosswinds. When prevailing winds are consistently from one direction, runways are best oriented in that direction. In many cases however, a high degree of consistency of wind direction is not found, and thus the crosswind component is also evaluated to ensure acceptable wind coverage. Crosswinds are winds which tend to be perpendicular to the runway or path of an aircraft while landing or taking off. At an airport with a single runway, that runway should be oriented with respect to the prevailing winds so that at least 95 percent of the time the crosswind component does not exceed a velocity of 10.5 nautical miles per hour (knots). Where a single runway does not provide at least 95 percent coverage, a combined system of runways or a widened runway should be considered that will meet the 95 percent criteria.

The FAA recommends 95 percent wind coverage for various crosswind components based on specific airport reference codes (ARC). The 95 percent wind coverage is computed on the basis of the crosswinds not exceeding 10.5 knots for ARC A-I and B-I, 13 knots for ARC A-II and B-II, 16 knots for ARC A-III and B-III, and C-I through D-III, and 20 knots for ARC A-IV through D-IV as detailed in AC 150/5300-13 "Airport Design".

The existing ARC classification for Sussex County Airport as indicated on the approved ALP is B-II. Using the above referenced criteria, wind coverage would be computed for a 13 knot crosswind component. Although the wind coverage criteria recommends coverage based on the ARC of the runway, the runways have also been evaluated for a more conservative 10.5 knot crosswind (**Table 1-4**). This analysis is warranted due to the number of small, single engine piston and twin engine piston aircraft that utilize the Airport on a regular basis.

Table 1-4
Sussex County Airport
Wind Coverage (Percent)

	10.5 Knots	13 Knots	16 Knots
Runway 4-22			
ALLWEATHER	83.93	89.84	95.47
IMC*	94.72	97.39	99.22
Runway 13-31			
ALLWEATHER	91.23	95.40	98.56
IMC*	87.56	92.26	96.92
Combined 4-22/13-31			
ALLWEATHER	98.13	99.52	99.87
IMC*	98.48	99.64	99.97

*< 1,000' ceiling and /or visibility < 3.0 miles, but > 200' ceiling and visibility > 0.5 miles

The primary method of analyzing wind conditions at an airport is by using a wind rose. This is shown in **Exhibits 1-4** and **1-5**. Wind data is represented on the wind rose in terms of the percentage of time winds of different velocities blow from various compass directions. The concentric circles on the wind rose indicate wind velocity in miles per hour. The radial lines on the wind rose define the compass directions from which the winds originate. The numbers within the segments are the percentages of time and velocity the wind blows from that direction.

For this Master Plan Update, wind data for the period of 1998 to 2001 was obtained from the National Climatic Data Center in Asheville, North Carolina for Georgetown, Delaware. The wind roses indicate that Runway 4-22 and 13-31 provide greater than 95 percent coverage, and thus there is adequate wind coverage for the airport.

3. Runway Designations

Runway numerals for each runway end are determined from the approach direction to the runway end and should be equal to one-tenth of the magnetic azimuth of the runway centerline, measured in the clockwise direction from magnetic north. Although the true bearing of the runways will not change over time, the magnetic bearing will change as the location of magnetic north shifts. **Table 1-5** provides a summary of the true (geographic) compass readings for each runway and notes the magnetic declination required to adjust

Exhibit 1-4

All Weather Wind Rose

Exhibit 1-5
IMC Weather Wind Rose

to the magnetic compass readings. Based on this analysis, the designations for Runway 4-22 and 13-31 remain unchanged.

Table 1-5
Sussex County Airport
Runway Compass Reading Analysis

	Runway 4-22	Runway 13-31
True Compass Reading	32º 52'37"	122º 55'
Magnetic Declination	11E44'	11E44'
Magnetic Compass Reading	44º 36'	134º 44'

Source: Survey conducted June 2002 (McCrone)
Delta Airport Consultants, Inc. Analysis

4. Taxiway System

The FAA Advisory Circular, AC 150/5300-13, Airport Design, presents design standards for taxiway and taxilane development. A taxiway is defined as a path established for the taxiing of aircraft from one part of the airport to another. A taxilane is defined as the portion of the aircraft parking area used for the access between taxiways and aircraft parking positions.

Parallel to Runway 4-22, and 700 feet northeast of the runway centerline, is a 50 foot wide lighted taxiway (Taxiway 'A') with medium-intensity edge lighting. Taxiway 'A' provides a dual use entrance taxiway to each end of Runway 4-22. Taxiway 'B' serves as a perpendicular exit taxiway from Runway 4-22 to Taxiway 'A' and is located near the midpoint of Runway 4-22. Taxiway 'C' is a 70 foot wide non-lighted taxiway leading to the commercial hangar area on the east side of the airfield.

5. Airfield Pavements

Airfield pavements evaluated consist of runways, taxiways and apron. Runway 4-22, Taxiway 'A' and the apron space are all in good condition based on inspection by Delta Airport Consultants, Inc. Runway 13-31 and Runway 10-28 (closed) are in poor and

extremely poor condition, respectively.

Table 1-6 is a summary of the condition of each pavement surface at the airport.

Table 1-6
Sussex County Airport
Pavement Condition Summary

Pavement Surface	Pavement Type	Pavement Condition
Runway 4-22	Asphalt	Good
Runway 13-31	Concrete	Poor
Runway 10-28 (closed)	Concrete	Extremely Poor
Taxiway A	Asphalt	Good
Taxiway C	Asphalt	Fair

Source: Delta Airport Consultants, Inc.

6. Land Use

The County's Comprehensive Plan is currently under revision and is expected to be completed during Fall 2002. Information for this report is based on the Plan in effect during June 2002, last updated in 1997. The Sussex County Planning Commission advises and assists the County Council in planning and zoning matters.

Sussex County Airport is located within a predominantly agricultural and industrial area approximately one mile east of the city of Georgetown. The current airport property, including the Industrial Air Park, comprises approximately 615 acres that is zoned Light Industrial (LI-2). The majority of lands surrounding the Airport and Industrial Park are undeveloped and primarily agricultural or forested, with some wetland area along the western border. Residential areas are scattered throughout the area, but are found adjacent to the airport only to the south. Transportation corridors including Truck Route 9 and a portion of track supporting the Penn Central railroad encircle the airport property. The Industrial Air Park consists of 178 acres east of the primary airfield area and connected to the airfield via Taxiway 'C'.

Although there are existing residences in the immediate vicinity of the airport, the cooperative planning efforts of the City of Georgetown and Sussex County has created a scenario that encourages land use and zoning that is compatible with airport activities. Chapter 5, Environmental Overview, also discusses land use and zoning and **Exhibit 5-2** depicts existing land use and zoning designations.

The FAA prefers the airport owner control the defined Runway Protection Zone (RPZ) area to enhance protection of people and property on the ground. Such control includes the clearing and maintenance of incompatible objects and activities. The FBO terminal building and hangar are within the RPZ for Runway 13, representing a non-compatible land use.

D. TERMINAL AREA DEVELOPMENT

The terminal area for Sussex County Airport is located along the western boundary of the airport. The existing terminal area development consists of terminal facilities, T-hangars, tie-down apron fueling facilities and auto parking. An inventory of existing airport buildings and facilities is presented on **Exhibit 1-6**.

1. Airport Access

Primary access to the commercial aeronautical services and the northern perimeter of the airport is via U.S. Highway 9 east from Georgetown, connecting to local Route 319, or Airport Road. The truck route for U.S. Highway 9 (local Route 318 connecting to Route 321) circles the airport to the south and east and provides direct access to the Airport's Industrial Air Park.

Exhibit 1-6
Building Facilities

2. General Aviation Terminal Building

A 6,150 square foot, one-story terminal building completed in 2002 is located along Taxiway 'A' near the intersection of Taxiway 'B'. The primary function of the general aviation terminal/ramp office facility is to serve as the focal point for GA pilot and passenger transfer between ground transportation and general aviation aircraft. As such, it serves as a gateway to the community.

A secondary purpose is to provide office space for FBO personnel who service these aircraft. Also, pilots are able to access weather information and flight planning. This GA terminal building has adequate space to meet the demand for public circulation, pilot and passenger waiting area, pilots' lounge, a conference room and rest rooms (**Table 1-7**). The new terminal building also includes a 1,350 square foot restaurant offering an upscale menu and private dining facilities.

Table 1-7
Sussex County Airport
Terminal Building Dimensions

Type	Area (square feet)
Office Space (3 offices)	1,090
Restaurant	1,350
Conference Room	555
Lobby (includes restrooms & vending area)	1,100
FBO reception/control area	383
FBO office	190
Flight Planning	129
Pilots' Lounge	143
Weather Briefing Room	36
Mechanical Room	134

Note: All area dimensions are approximate.
Source: Sussex County Records
Delta Airport Consultants, Inc.

3. Automobile Parking

Approximately 50 paved parking spaces are allocated for public and employee parking near the FBO terminal. Another 40 paved spaces are directly adjacent to the new general aviation terminal building and associated restaurant. DeCrane Aircraft Systems Integration Group - PATS, which is located on the eastern side of the airport, has approximately 150 paved parking spaces for their employees. Buildings within the airport industrial park provide for their individual parking needs and were not included as a part of the inventory.

4. Aircraft Hangars

Conventional hangars typically provide storage for multiple aircraft of various sizes and types. There are fourteen conventional hangars at Sussex County Airport ranging in size from 50' x 50' to 130’ x 370’. Eleven of the conventional hangars were constructed for small aircraft or large aircraft (>12,500 lbs.) up to the medium sized business jet. Theses hangars total 53,850 square feet and represent approximately 25 percent of the total conventional hangar space at the Sussex County Airport. The remaining conventional hangar space (160,000 sq. ft.) was constructed for much larger aircraft such as the Boeing 727 and 737. It is significant to note that more than half of all conventional hangar space is committed to aircraft maintenance operations and therefore not available for typical aircraft storage.

T-hangars are individually nested structures that are capable of accommodating one aircraft per unit. T-hangars are capable of accommodating single engine and small twin engine aircraft only, while larger aircraft are generally stored in conventional hangars. Currently, there are four T-hangar facilities at the airport; two single aircraft units, one 6-unit structure and one 10-unit structure providing a total of 18 individual storage units. Exhibit 1-8 illustrates all hangars located on the airport.

5. Aircraft Apron and Tie-downs

Another method of aircraft storage is aircraft tie-downs. All existing aircraft tie-downs for Sussex County Airport are located near the general aviation terminal building. Currently, there are approximately 42 paved tie-downs and 14 grass tie-downs. Paved apron space is approximately 28,000 square yards, to accommodate both based and transient aircraft parking needs.

E. SUPPORT FACILITIES AND SERVICES

This section describes the many support facilities and services at Sussex County Airport.

Services include FAA certified repairs, aircraft hangar rentals, aircraft tie-downs, and refueling. Services for pilots of aircraft are provided by a fixed base operator (FBO) or specialized aviation service operator (SASO). The facilities include refueling facilities, storage facilities and airport rescue and fire fighting. Utilities and infrastructure are also discussed.

The airport has established minimum standards and requirements for the conduct of commercial aeronautical services and activities. As is the case with many airports, the privilege to sell aircraft fuels and oil services to the general public requires a significant investment by the FBO operator. Typical requirements for such a "full service" FBO are to provide a terminal area that accommodates pilot and passenger lobby, restrooms, flight planning as well as area for the general public. Adequate parking for automobiles, equipment and aircraft must also be provided. Commercial aeronautical service providers that do not meet the "full service" criteria are typically considered specialized service operators. Both full service and specialized services providers are discussed further in this section.

1. Fixed Base Operators (FBOs)

A full service Fixed Base Operator (FBO) is defined as a full service commercial operator who engages in the primary activity of aircraft refueling and one or more of the following secondary activities: airframe and power plant maintenance, flight training, aircraft rental, air charter or taxi, avionics maintenance and sales and aircraft storage.

Sussex County Airport has one full-service FBO on the field. Georgetown Air Services offers a wide variety of services to the general aviation pilot including fueling, maintenance, flight instruction and air taxi/charter service. The FBO offers aeronautical services, and specifically fuel sales, to the flying public.

Georgetown Air Services main operations occupy a 2,200 square foot building on the western side of the airport boundary. The FBO ramp services area and office is located in the general aviation terminal building.

2. Specialized Aviation Service Operators (SASO)

A Specialized Aviation Service Operator (SASO) is a commercial aeronautical business that offers a single or limited commercial aeronautical service such as flight training, aircraft, airframe and powerplant repair, maintenance, aircraft charter, air taxi or air ambulance, aircraft sales or other commercial flight support business. Sussex County Airport has three SASOs on the field – American Aerospace, Sussex Aero Maintenance, and DeCrane Aircraft Systems Integration Group, PATS Inc.

American Aerospace is located on the airfield and provides aircraft maintenance, parking, and aircraft flight school and rental. The maintenance hangar (including office space) encompasses approximately 2,500 square feet. American Aerospace is considered a limited FBO because it currently does not provide fuel sales to the general public, only to the aircraft it owns or manages.

Sussex Aero Maintenance is located on the airfield and provides aircraft maintenance to the flying public. The maintenance hangar (including office space) encompasses approximately 6,400 square feet. Sussex Aero Maintenance is considered a limited FBO because it currently does not provide fuel sales to the public.

DeCrane Aircraft Systems Integration Group – PATS, operates an Aircraft Modification and Service Center at the Airport. In January 1999, PATS Incorporated was acquired by DeCrane Aircraft Holdings Inc. The business occupies two hangars and associated support buildings totaling 145,000 square feet. The buildings can accommodate up to five B737 or B727 aircraft simultaneously. The Center specializes in aircraft structural modifications and repairs, installation of PATS' own proprietary long-range auxiliary fuel systems, Aviation Partners' blended winglets, and the most popular brands of avionics, cabin electronics and cabin interior components. PATS was named an authorized Boeing Business Jet (BBJ) Service Center by Boeing in 1999. They are the sole provider of the auxiliary fuel system for the Boeing Business Jet (a derivative aircraft of the B737-700 family).

3. Fuel Storage and Dispensing Equipment

Sussex County Airport has a total of eight above ground storage tanks (AST) for fuel – Jet-A, 100LL AvGas, auto and diesel. Fuel is dispensed via trucks owned by the County,

Georgetown Air Services, DeCrane and the State Police. **Table 1-8** lists all fuel tanks and trucks located on the airfield.

Table 1-8
Sussex County Airport
Fuel Storage and Dispensing Equipment

Equipment	Owner	Capacity	Content Use
AST	FBO - GAS	10,000	Jet-A
AST	FBO - GAS	10,000	100LL Avgas
AST	FBO - GAS	--	Sludge
AST	FBO - GAS	--	Sludge
AST	SASO – AA	1,000	100LL Avgas
AST	SASO – DeCrane	10,000	Jet-A
AST	Sussex County	1,000	Auto Gas
AST	Sussex County	550	Diesel Fuel
Truck	FBO - GAS	5,000	Jet-A
Truck	FBO - GAS	2,000	Jet-A
Truck	FBO - GAS	1,200	100LL Avgas
Truck	SASO - DeCrane	5,000	Jet-A
Truck	State Police	5,000	100LL Avgas
Truck	State Police	5,000	100LL Avgas

Note: AST – Above Ground Storage Tank
GAS – Georgetown Air Services
AA – American Aerospace
Source: GED Tenants
Delta Airport Consultants, Inc. Analysis

Georgetown Air Services owns and operates four of the tanks and three of the fueling trucks. The fuel farm is located northeast of the FBO terminal building. American Aerospace owns and operates a single tank to supply/sell fuel to their customers. DeCrane owns and operates one AST, which holds Jet-A fuel for use in their customers' aircraft. DeCrane also owns one fueling truck. The Delaware State Police do not have any fuel tanks but own/maintain two fuel trucks. Their fuel is bought off-site and trucked onto the airport.

4. Ground Support Equipment (GSE) Storage/Snow Removal

Sussex County owns or leases the equipment used to maintain the airfield. The equipment is stored in a maintenance equipment storage building and outside the building (snow removal equipment). The County has two employees who operate this equipment and maintain the airfield at all times and eight personnel for snow removal (rotation

dependent on amount of snowfall). If there is an abundance of snow the County has contract services with A.P. Croll & Son and/or King Construction, both of Georgetown, DE.

The equipment includes:

- 1991 International Dump Truck with 10' Snowplow
- 1974 Chevrolet Dump Truck with 10' Snowplow
- 1988 485-Case IH Tractor with 8' Snowplow
- 1997 5640-Ford New Holland Tractor with 8' Snowplow
- 1991 595-Case IH Tractor with 6' Front End Loader
- 1988 Case IH Tractor
- 1997 5640-Ford New Holland Tractor
- 1986 255-Case IH Tractor
- 1998 Woods 10-Foot Mower, Model 121
- 1995 Woods 10-Foot Mower, Model 121
- 1999 Woods 6-Foot Mower, Model L59
- 2002 Sweeper Truck
- 2002 Chevrolet C-3500 Dual Wheel (Dump Body) with Snowplow

5. Fire Protection

General aviation (GA) airports such as Sussex County are not required to have specific on-airport rescue or firefighting staffing. GA airports typically receive these services from the local community emergency agencies. Fire protection for the airport is provided by the Sussex County Fire Rescue Station 28, which is located approximately two miles from the airport.

6. Utilities and Services

Electrical power to the airport is provided by Conectiv. Guy Eberwein, responding for Conectiv, advised that the existing and proposed demand for electrical power at the airport is within the capacity currently provided. However, if the capacity becomes

insufficient, it will be the responsibility of Conectiv, as a public utility, to supply the additional capacity necessary to support the development. The airport has also installed an emergency generator near the electrical vault (Ref: Exhibit 1-8) to support the airfield lighting, as well as the FBO office and the restaurant's cooler located in the new terminal building.

Natural gas is supplied by Tri-Gas and Oil Co., Inc. All existing service needs are being met and the company would expand services as necessary, to meet future demand.

Telephone service is provided by Verizon. Terri Keiffer, Verizon Engineering/Mid-Atlantic Region, advised that existing service is adequate and that as a public utility, Verizon would accommodate future demand as needed.

Water and sewage services are provided by the Town of Georgetown. The existing and proposed capacity will be sufficient for the 20-year planning period. An emergency generator supports the waste water pump station located directly behind the north T-hangar facility (Ref: Exhibit 1-8).

F. AIRPORT LIGHTING AIDS

This section of the chapter details the airport lighting and visual aids that are available at Sussex County Airport. These systems aid the pilot in locating and operating in the airport environment.

1. Airport Beacon

The airport beacon is a visual navigational aid used to help pilots locate the airport environment using a rotating light with green and white lenses to produce a flashing effect. The airport beacon located at Sussex County Airport is mounted atop the FBO terminal building near the mid-point of Runway 4-22 and approximately 900 feet northwest of the runway centerline. The beacon is currently in good condition, however is not clearly visible to aircraft approaching the airport from the north.

2. Segmented Circle and Tetrahedron

The segmented circle and tetrahedron includes a series of objects on the ground designed to give visual traffic pattern and wind direction information to pilots in the air. A traffic pattern indicator extends from the landing strip indicator when a right-handed traffic pattern exists. The segmented circle is located off the traffic area with a wind indicator located at its center. Segmentation of the circle is necessary so that it can be readily distinguished from a solid circle which is sometimes used to mark the center of a landing area.

Wind indicators pivot in the wind and may be a tetrahedron, windcone, windsock or combination thereof. A windcone is a tapered, tubular cloth vane, open at both ends and having at the larger end a fixed ring pivoted to swing freely. Wind indicators are installed at airports to aid pilots in determining wind direction and approximate intensity which in turn yields takeoff and landing information. The tetrahedron and segmented circle for the Sussex County Airport is located east of the terminal building, approximately 2,000 feet from the Runway 4 approach end and about 600 feet northwest of the runway centerline. Both components are in good condition.

3. Precision Approach Path Indicators (PAPIs)

Precision Approach Path Indicators (PAPIs) are a system of lights that provide visual descent guidance during the approach to a runway in relatively good weather conditions. These lights are typically visible from three to five miles during the day and up to 20 miles or more at night. PAPI light installations are installed in a single row of either two

or four light units. The unit is normally installed on the left side of the runway. The basic principle of the PAPI is that of color differentiation between red and white. Each light unit projects a beam of light having a white segment in the upper part and a red segment in the lower part of the beam. The light units are arranged so that the pilot using the PAPI during an approach will see an equal number of red and white lights if on the proper glide path angle. If the approach is too high, the lights will be white; if too low, the lights will be red.

Sussex County Airport has a 4-unit PAPI installation to assist with the approach to Runways 4 and 22. The current aiming angle, as denoted on the Airport Layout Plan, is a two degree glide path. Threshold crossing heights of approximately 20 feet are required for both Runways 4 and 22 due to natural growth obstructions within the clearance plane.

4. Runway End Identifier Lights (REILs)

REILs provide a rapid and positive identification of the approach end of a particular runway and assist the pilot as a visual lateral course guidance aid. These lights consist of a pair of synchronized flashing lights, one located on each side of the runway threshold facing the approach path. REILs may be either omni-directional or unidirectional. Currently, unidirectional REILs provide aircraft with assistance (identifying end of useable runway pavement) for approaching and landing operations on both Runways 4 and 22. The REILs are in good condition.

5. Runway Edge Lights

Runway edge lights outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity or brightness they are capable of producing, and are identified as High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL) or Low Intensity Runway Lights (LIRL). While Runway 4-22 at Sussex County Airport is equipped with MIRLs

that are currently in good condition, the condition of the MIRLs on Runway 13-31 is poor.

6. Taxiway Edge Lights

Taxiway edge lights are used to outline the edges of taxiways. Similar to runway edge lights, these light systems are classified according to the intensity of light they emit. Taxiways 'A' and 'B' are equipped with Medium Intensity Taxiway Lights (MITLs). The MITLs are in good condition. Taxiway 'C' is not lighted with edge lights.

7. Control of Airport Lighting Systems

Sussex County Airport is one of many airports that are not staffed 24-hours, and thus have pilot-controlled lighting systems. These systems are activated by keying the aircraft's microphone switch several times in rapid succession on a predetermined and published radio frequency. These systems provide a greater degree of safety for the pilot and reduce the operating cost and maintenance for airport operators.

The radio frequency, also known as the Common Traffic Advisory Frequency (CTAF), eliminates the need for pilots to change frequencies to turn the lights on and allows a continuous listening watch on a single frequency. A CTAF is a frequency designated for the purpose of carrying out airport advisory practices while operating to or from an airport without an operating control tower. The CTAF is published on the instrument approach chart and in other appropriate aeronautical publications.

G. AIRPORT WEATHER CONDITIONS AND SERVICES

Weather is a factor which significantly affects the airfield operating environment. In relation to aircraft operational conditions and the associated aircraft approach activity, weather conditions are comprised of two categories. Instrument Meteorological Conditions (IMC) exist when the

pilot operating the aircraft must use all available navigational aids and FAA Instrument Flight Rules (IFR) to operate an aircraft under less than adequate (reduced visibility, fog, rain, snow, etc.) weather conditions. Visual Meteorological Conditions (VMC) exist when the pilot operating the aircraft must establish visual contact with the runway and rely on this view to prepare for initial and final approach procedures under FAA Visual Flight Rules (VFR), which includes alignment with the runway before landing the aircraft. Sussex County Airport operates under VMC conditions the majority of the time.

Airport weather conditions are often monitored by automated observing systems. These systems provide detailed data that is available to pilots via a recorded message accessed by a specified radio frequency or telephone contact. Two such systems are currently in use; 1) Automated Surface Observing System (ASOS) primarily deployed by the U.S. National Weather Service and 2) Automated Weather Observing System (AWOS) which provides similar information, based on specifications from the FAA.

Sussex County Airport has an ASOS that reports altimeter settings, wind data, temperature, dew point, density altitude, visibility and cloud/ceiling data. The system is located east of the terminal building, approximately 2,000 feet from the Runway 4 approach end and about 600 feet northwest of the runway centerline.

H. INSTRUMENT APPROACH PROCEDURES AND NAVAIDS

An instrument approach/departure is a published procedure established by the FAA that outlines the route and altitudes to be flown by an aircraft for safe flight during takeoff or landing. This section discusses established instrument approach procedures and navigational aids (NAVAIDS) as related to flight operations at the Sussex County Airport. There are various types of electronic NAVAIDS that provide a special purpose to the system of air navigation.

GED has four published instrument approach procedures to Runway 4-22 at the airport. All four are non-precision approaches and include an RNAV (GPS) (radio navigation or global positioning system) approach and a VOR (very high frequency omni-directional range) approach

for each runway end. Each instrument approach procedure includes an allowable minimum descent altitude (MDA) and a limiting minimum visibility, beyond which point the pilot must execute a missed approach and re-attempt the landing effort, or divert to another airport. The altitude references are expressed in both MSL (Mean Sea Level) and AGL (Above Ground Level). The visibility minimums for the GED published approaches vary depending on the approach category of the given aircraft. The following is a brief description of each NAVAID, and the related procedure, available to support instrument approaches to the Sussex County Airport.

1. RNAV (GPS)

The RNAV approach employs a method of aircraft navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigational signals or within the limits of a self-contained system capability. RNAV operations at Sussex County Airport involve radio equipment onboard the aircraft receiving signals radio transmitting stations (i.e. VOR) in the general area. Such area navigation uses 'way points', (computer generated points of reference), thereby providing a flexible routing capability that allows for better utilization of airspace than other navigational systems. The GPS approach employs a space-based radio satellite positioning, navigation and time-transfer system, providing highly accurate location information. When programmed by the pilot, the receiver on-board the aircraft automatically selects appropriate signals from the available satellites and translates these into three-dimensional position, velocity and time references.

The RNAV (GPS) approach for Runway 4 is initiated approximately eleven nautical miles southwest of the airfield at the TOWHE waypoint. The RNAV (GPS) approach for Runway 22 is initiated approximately nine nautical miles northeast of the airfield at the BOYSE waypoint. As published, the minimums for the RNAV (GPS) approaches are an LNAV (Lateral Navigation) MDA of 480 feet MSL (approximately 430 feet AGL) with one and one-quarter mile visibility for an aircraft within approach category C, or one mile visibility for approach categories A and B (**Exhibits 1-7 and 1-8**).

Exhibit 1-7
RNAV (GPS) - Runway 4

Exhibit 1-8
RNAV (GPS) - Runway 22

2. VOR

A VOR is a navigational aid that transmits a radio signal in all directions. Aircraft equipped with the appropriate receiver may use this signal to navigate. A VOR is used for en route navigation of VFR and IFR aircraft as well as for non-precision instrument approaches. Some VOR stations include distance measuring equipment (DME) used to measure the slant range distance of an aircraft from the DME navigational aid. This additional equipment enhances the navigational information such that approach minimums are often significantly reduced. This is the case for the approach to Runway 22 at Sussex County Airport.

The VOR approach to Runway 4 at Sussex County Airport is initiated approximately eleven nautical miles southwest of the airfield at the LAURY intersection, a point established by intersecting radials from the Salisbury VOR and the Waterloo VOR/DME stations. These navigational stations are located approximately 22 and 10 miles respectively from the airfield and provide the foundation of radio navigation for establishing instrument approach fixes for GED. As published, the minimums for the straight-in approach to Runway 4 are an MDA of 520 feet MSL (approximately 470 feet AGL) with one and one-quarter mile visibility for an aircraft within approach category C and one mile visibility for an aircraft within approach categories A and B (**Exhibit 1-9**).

The VOR approach to Runway 22 is initiated approximately ten nautical miles northeast of the airfield at the Waterloo VOR/DME station. As published, the minimums for the straight-in VOR approach to Runway 22 are an MDA of 620 feet MSL (approximately 570 feet AGL) with one and one-half mile visibility for an aircraft within approach category C. For those aircraft equipped with DME, the minimums are lowered to an MDA of 440 feet MSL (approximately 390 feet AGL) with one mile visibility for an aircraft within approach category A, B and C. (**Exhibit 1-10**).

Exhibit 1-9
VOR - Runway 14

Exhibit 1-10
NDB - Runway 14

I. AIRSPACE

1. Airspace Structure

The airspace over the United States, to an altitude of approximately 60,000 feet MSL (Flight Level – FL600), is separated into two parts, terminal and enroute airspace. Terminal airspace is that area around the nation's major airports extending to a specified altitude that may encompass an area of sixty miles in diameter and include several airports. Enroute airspace is the area within which aircraft transit from one terminal airspace to another. There is no specified bottom altitude to enroute airspace and the top extends to the upper performance limits of civil aircraft. U.S. airspace is further divided into several different categories each having different rules and regulations.

The airspace categories are designated Class A, B, C, D, E, G, transition areas and continental control area. **Exhibit 1-11** illustrates the different classes of airspace. The Class B, C and D areas are ascribed to Airport Traffic Areas (ATA). Each class of ATA has a given radius, with Class B and C having extensions (transition areas) to encompass the final portion of an instrument approach procedure.

The Sussex County Airport is located near the very busy northeast air traffic corridor. The Washington Tri-Area Terminal Area with its Class B airspace is located less than 50 miles to the west, and the Philadelphia Terminal Area is located to the north approximately the same distance. High speed and transport air traffic operate from military bases in the region, including Dover Air Force Base to the north and Patuxent Naval Air Station (NAS) to the southwest. There is also restricted airspace associated with Patuxent NAS within 25 miles of the airfield.

Exhibit 1-11

FAA Airspace Designation

The airport is surrounded by Class G and E airspace. Class G airspace is uncontrolled airspace. The Class E controlled airspace around the airport starts at 700 feet Above Ground Level (AGL) and extends vertically to 14,500 feet Mean Sea Level (MSL) when it reaches Class A airspace. Class E airspace is a controlled area which includes airspace corridors identified as federal airways, or which accommodate jet traffic at low altitudes. **Exhibit 1-12**, VFR Airspace and Air Traffic Control, depicts the Class E airspace surrounding the Sussex County Airport including the transition area extending towards the Waterloo VOR/DME. **Exhibit 1-13**, IFR Airspace and Air Traffic Control, depicts the established IFR enroute airways and associated reporting points within a 25 nautical mile radius of GED.

2. FAR Part 77 Imaginary Surfaces

Federal Aviation Regulation (FAR) Part 77 establishes standards for determining obstructions in navigable airspace; sets forth the requirements for notice to the Administrator of certain proposed construction or alteration; provides for aeronautical studies of obstructions to air navigation, to determine their effect on the safe and efficient use of airspace; provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation; and provides for establishing antenna farm areas.

For the purposes of FAR Part 77 obstruction analysis, the Sussex County Airport is considered a public use airport with one non-precision instrument runway and one visual runway. The airport is currently designated a class B-II airfield. It offers multiple non-precision instrument approaches (34:1 slope) to Runway 4 and Runway 22 with approach visibility minimums greater than or equal to one mile, and a visual approach (20:1 slope) to Runway 13 and Runway 31. Any existing fixed or mobile objects are, and future objects may be, obstructions to air navigation if they are of greater height than any of the

Exhibit 1-12

Exhibit 1-13
IFR Airspace and Air Traffic Control

heights or surfaces outlined in FAR Part 77.23. The determination of whether an ♣obstruction♠ is actually a ♣hazard♠ is accomplished through an aeronautical study conducted by the FAA. The standards apply to all objects, whether manufactured, objects of natural growth, or terrain.

Specifically, the following civil airport imaginary surfaces are established under FAR Part 77 with relation to each airport and to each runway:

- Primary Surface
- Approach Surface
- Transitional Surface
- Horizontal Surface
- Conical Surface

In order to fully protect the Sussex County Airport environs from potential hazards to air navigation, it is important that the obstruction analysis evaluate penetrations based on the Part 77 imaginary surfaces for the non-precision instrument runway and the visual runway.

The state ordinance protecting Part 77 airspace is found in Titles 2 and 9 of the Delaware Code relating to aeronautics and building codes. The local ordinance is found in the "Sussex County Airport Hazard Zoning Ordinance", 115-144. The ordinance places height restrictions on structures and/or trees in the zones specified.

Existing objects within the protected airspace or known penetrations to Part 77 surfaces include both trees and buildings/structures. Runway 13-31 has a 20:1 visual approach with existing obstructions including a large group of trees along the approach path to Runway 13, approximately 1,200 to 2,000 feet off the runway end. The FBO terminal/hangar and rotating beacon penetrate the approach surface to Runway 13, approximately 1,050 feet off the runway end. Penetrations to the transitional surfaces

exist on both sides of the approach path to Runway 31, approximately 800 to 1,000 feet from the runway end.

Runway 4-22 currently is a 34:1 non-precision approach. Large groups of trees penetrate the approach surfaces to Runway 4 and Runway 22, approximately 2,000 to 3,500 feet and 1,600 to 2,500 feet off the runway end, respectively. Penetrations to the transitional surfaces exist on both sides of the approach end of Runway 4 and Runway 22; 400 to 1,000 feet and 500 to 800 feet from the runway centerline, respectively.

J. AIRPORT COMMUNICATIONS

The airport does not have a FAA Air Traffic Control Tower (ATCT). However, the Washington Air Route Traffic Control Center (ARTCC) provides radar separation on all aircraft operating on IFR flight plans within controlled airspace, and principally during the en route phase of flight. Instrument operations to and from the Sussex County Airport are supported by Dover Approach and Departure Control located at Dover Air Force Base. Ground control and separation of VFR aircraft operating near the airport is performed by the pilot under visual flight rules.

The airport may be reached by calling Georgetown Air Services at 302.855.2355 for general information or operational requests. The airport also has an on-site ASOS that provides up-to-date local weather reporting at 302.856.2927. Radio communications available at Sussex County Airport and within the airport area are listed in **Table 1-9**.

Table 1-9
Sussex County Airport
Radio Frequencies

Source	Frequency
CTAF	123.0
Unicom	123.0
WX ASOS	118.375
Pilot Controlled Lighting	122.95
Dover Approach	132.425
Dover Departure	132.425
Clearance Delivery	125.55

Source: AirNav.com

K. SECURITY

The Sussex County Airport is a general aviation airport with flights typically operating under Federal Aviation Regulations (FAR) Part 91 and "For Hire" aircraft operated under FAR Part 135. The airport is not subject to the security requirements set forth in FAR Part 139 due to no presence of scheduled commercial air service with aircraft of more than 19 passenger seats. Although no specific mandate for security exists, many GA airports provide a basic level of fencing, gated access and/or personnel to secure the airfield area. The interest in such measures has increased significantly since September 11, 2001, and there is a growing demand that GA airports increase their level of security awareness.

Sussex County Airport's primary security measure is the presence of a guard patrol, with vehicle, on duty 24 hours a day, seven days a week. The guard is supported in an emergency situation with the Delaware State Police Helicopter unit that is based at GED. The State Police hangar is also staffed full-time.

Perimeter fence and gate access controls are limited at GED but do provide a basis for implementing an access control system. Two electronic card reader gates are currently installed; one southwest of the new terminal building and one north of the DeCrane Hangar Facility. Access authority for the gates is granted to County operations and maintenance personnel as well

as key airport tenants and users. The gates may be "siren activated" to allow approaching emergency vehicles expedited passage.

Although the airport perimeter encompasses more than 25,000 linear feet, only approximately 1,000 feet is currently fenced along Truck Route 9 near the approach end of Runway 4. This fence line is primarily to deter vehicle access directly from the roadway and is stranded barbed wire on posts. Drainage ditches and densely forested areas provide minimal restricted vehicle access in remote areas of airport property. Additionally, a six foot high chain link fence around the DeCrane Facility offers a baseline level of security for the large commercial type aircraft (B737-700) typically on-site there.

No fence line currently exists that provides any direct access control to the airfield or aircraft. Intrusion is possible from virtually all borders by both humans and wildlife.

L. EXISTING NON-STANDARD CONDITIONS

FAA Advisory Circular (AC) 150/5300-13, Airport Design, provides design standards for runways and runway-associated elements, as well as taxiways, taxilanes and other airport elements. The guidance provided by AC 150/5300-13 references many other AC documents for specific applications and is complemented by FAR Part 77 which establishes standards for determining obstructions in navigable airspace and provides for aeronautical studies of obstructions to air navigation.

A key objective of any planning project should be to identify any non-standard conditions that exist on the airport, and offer recommendations on actions to achieve full compliance with FAA Standards. Non-standard conditions exist at the Sussex County Airport and are highlighted in the following text and in **Table 1-10**. Recommendations to achieve standards will be presented in Chapter 4, Alternatives.

Table 1-10
Sussex County Airport
Non-Standard Conditions

Non-Standard Condition	Existing	Standard
Runway 13-31 width	50’	60’

Note: Standard Runway length for 13-31 is based on 75% of small airplane fleet.
Source: Delta Airport Consultants, Inc.

As per AC 150/5300-13, *Airport Design*; the existing width of runway 13-31 presents a non-standard condition. All other design standards for existing airfield facilities at GED are met or exceeded.

M. INVENTORY SUMMARY

The Delaware Aviation System Plan Update (DASPU) notes that the Sussex County Airport (GED) is one of nine public use airports in the state, and the only publicly owned airport in Sussex County. The DASPU ranks GED fourth in the state by annual GA operations and among the top three in the number of GA based aircraft. Among the state’s public use airports, GED is second only to New Castle County Airport in length of primary runway, instrument approach procedures available, total apron area and conventional hangar space. In Delaware, the most significant demand for airports, airport facilities and airport services stems from general aviation. The Sussex County Airport plays a vital role in meeting this demand.

The existing role of GED is to serve category B-II aircraft, similar to the Cessna Citation II. Existing primary Runway 4-22, with four published instrument approach procedures, meets the demand for this type aircraft; however the existing crosswind Runway 13-31 fails to meet the minimum FAA design criteria to adequately serve the smaller aircraft operating at the airport. The County has previously studied reopening Runway 10-28 to provide an enhanced crosswind landing capability for the small aircraft. A survey of airport users indicated that the commercial aeronautical services offered at the airport are adequate, but expressed a desire for additional instrumentation to support runway approaches during inclement weather and additional runway length for higher performance aircraft.

The airport owner and local governmental agencies encourage compatible land use near the airport, evidenced by the substantial industrial development in the area, and have acquired land as necessary in an effort to control the land use within the runway protection zones (RPZ). Additional land acquisition is required to gain full control of the RPZs. State and local ordinances have been adopted to protect the airspace near the airport from objects that might penetrate the FAR Part 77 surfaces, however aerial surveying indicates natural growth penetrations are present to both approach and transitional surfaces. Further analysis and ground surveying is required to confirm the penetrations and determine mitigation needs.

Existing conditions that do not meet the minimum criteria for FAA design standards have been identified. The non-standard conditions relate to Runway 13-31 width and length, however additional evaluation of Runway 4-22 is required during the runway justification analysis phase of the Master Plan effort. The airfield appears to be deficient in some areas of fundamental development. ie: parallel taxiway for the crosswind runway, perimeter fencing. Further consideration of such fundamentals should be evaluated during the facilities requirements and alterative development phases of the Master Plan effort.