Airport Master Plan

Final Report

Prepared for
Floyd Bennett Memorial Airport
Glens Falls, NY

By
C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
Syracuse, NY 13212

June 2009

FAA AIP No. 3-36-0033-17-98
NYSDOT No. 1903.58

"The preparation of this document was financed in part through a planning grant from the Federal Aviation Administration as provided in the Airport and Airway Improvement Act of 1982, as amended. The contents of this report reflect the analysis and findings of C&S Engineers, Inc., who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable with applicable Public Laws."

TABLE OF CONTENTS

TABLES

CHARTS

FIGURES

APPENDICES

Chapter 1 – Introduction

1.01 General

Floyd Bennett Memorial Airport, GFL is a publicly owned, public-use, transport-category facility. It serves the aviation needs of Warren County and the Northern Region of New York State. Warren County owns the airport and its operation is the responsibility of the Department of Public Works. In order to determine the potential of the airport, and to identify specific opportunities for improving its airport facilities, Warren County applied for and received a planning grant (AIP# 3-36-0033-17-98) from the Federal Aviation Administration (FAA) under the Airport Improvement Program (AIP), of the Airport and Airway Improvement Act of 1982, as amended.

1.02 Historical Context

Floyd Bennett (1890-1928), American aviator, was born near Warrensburg, N.Y., educated in public schools, and later trained as a garage mechanic. He enlisted in the aviation corps, U.S. Navy, in 1917, and became an instructor in aviation mechanics at the U.S. naval base at Hampton Roads, VA. In 1922 he was transferred to Norfolk, VA., where he met the American explorer Richard Byrd. Bennett piloted the plane in which Byrd flew across the North Pole in 1926. Byrd chose him as second in command of a planned flight to the South Pole, but Bennett did not live to take part in that expedition. Earlier, while flying from Detroit to Quebec, to aid the crew of a transatlantic airplane stranded on Greenly Island, he contracted pneumonia and died soon after his return. Floyd Bennett Memorial Airport was dedicated in 1999.

1.03 Purpose and Scope of Study

The main objective of this study is the preparation of an Airport Master Plan to determine the extent, type, and schedule of improvements necessary to accommodate existing needs and future aviation demand at the airport. The recommended development shall be presented in the following three planning periods: short-term (2000-2005), intermediate-term (2006-2010), and long-term (2010-2020). The recommended development program will also attempt to satisfy aviation demand and be compatible with the environment, community development, and other transportation modes. Above all else, the plan must be technically sound, practical, and economically feasible. The following objectives shall also serve as a guide in the preparation of the study:

- To provide an effective graphic representation of the ultimate development of the airport
- To establish a schedule of priorities and phasing for the various improvements proposed in the plan
- To present the pertinent backup information and data which were essential to the development of the master plan
- To describe the various concepts and alternatives which were considered in the establishment of the proposed plan
- To provide a concise and descriptive report so that the impact and logic of its recommendations can be clearly understood by local residents and by those authorities and public agencies which are charged with the approval, promotion, and funding of the improvements proposed in the Master Plan
- To ensure that the airport thoroughly complements and supports development envisioned for Warren County and the Northern New York Region
- To ensure the reliability and safety of airport operations.

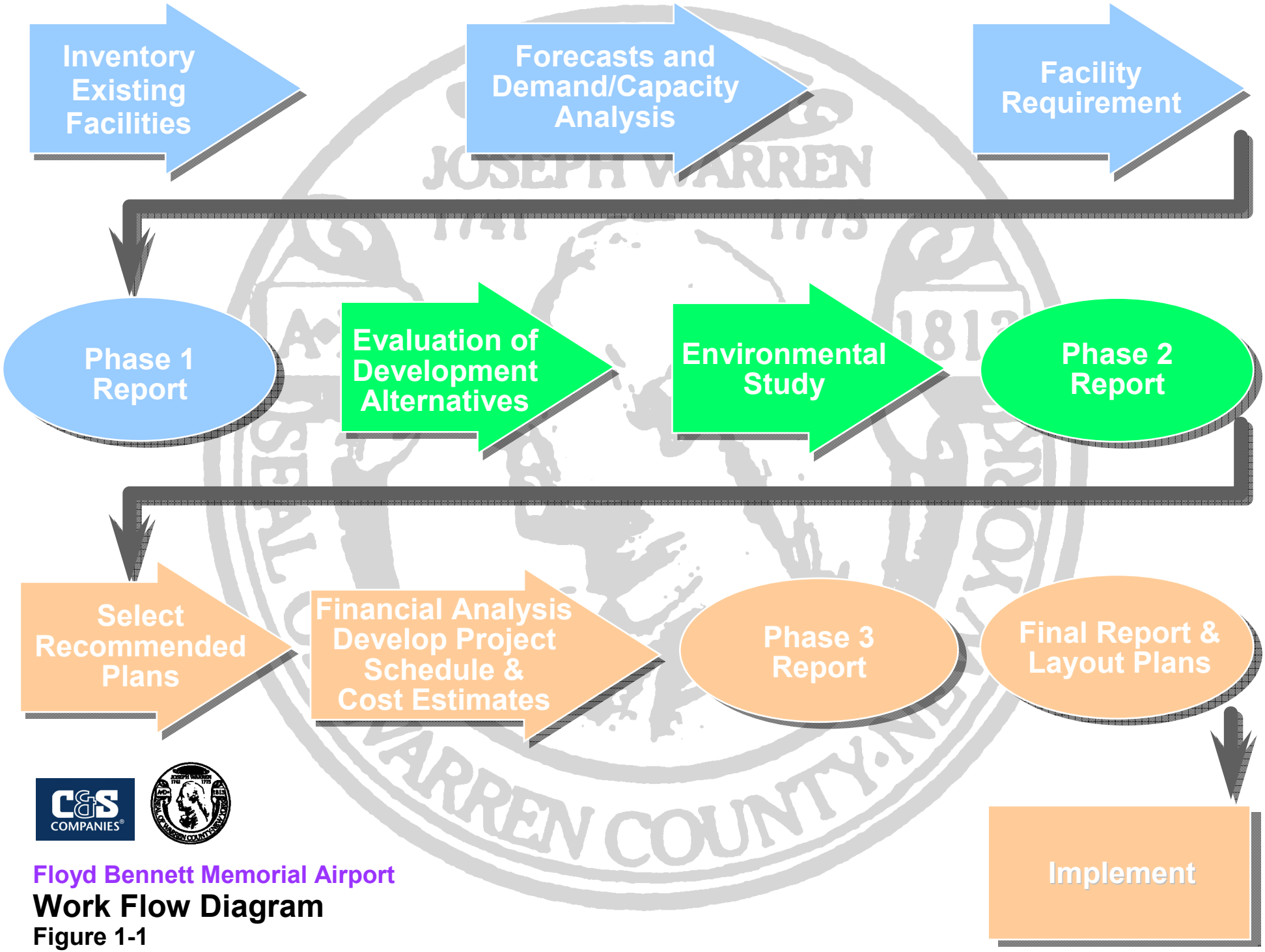
1.04 The Planning Process

The Airport Master Plan is comprised of four basic steps (see Figure 1-1). The first step involves an examination of existing conditions, including data collection, inventory and operations analysis. Also included in this phase is a needs analysis, which involves preparing aviation demand forecasts, translating these forecast values into a listing of required airport facilities, and analyzing the demand/capacity relationships at the airport. In this master plan, this step is presented in the Phase 1 Report.

The second step, using these analyses as a basis for preparing alternative development concepts, includes an environmental study and concludes with the evaluation of the airport development alternatives. This step is presented in the Phase 2 Report.

The third step involves the identification and detailing of recommended plans and presents a staged Capital Improvement Program (CIP), financial program, and an analysis of economic and financial feasibility. The Final Report documents this step and also incorporates the Phase 1 and Phase 2 Reports.

The fourth and final step is the implementation of the plan. This Airport Master Plan is meant to be an active guide for the future development of the airport, and should be used as such.



C&S COMPANIES®

Floyd Bennett Memorial Airport

Work Flow Diagram

Figure 1-1

Chapter 2 – Inventory of Existing Facilities

2.01 Study Area

The study area for Floyd Bennett Memorial Airport includes Warren, Washington and northern Saratoga Counties (Town of Moreau). The evaluation of data from this area will be used to develop a socio economic profile of the area. A pilot survey was used to collect data and is summarized in Appendix D. The study area is depicted on Figure 2-1.

FLOYD BENNETT MEMORIAL AIRPORT

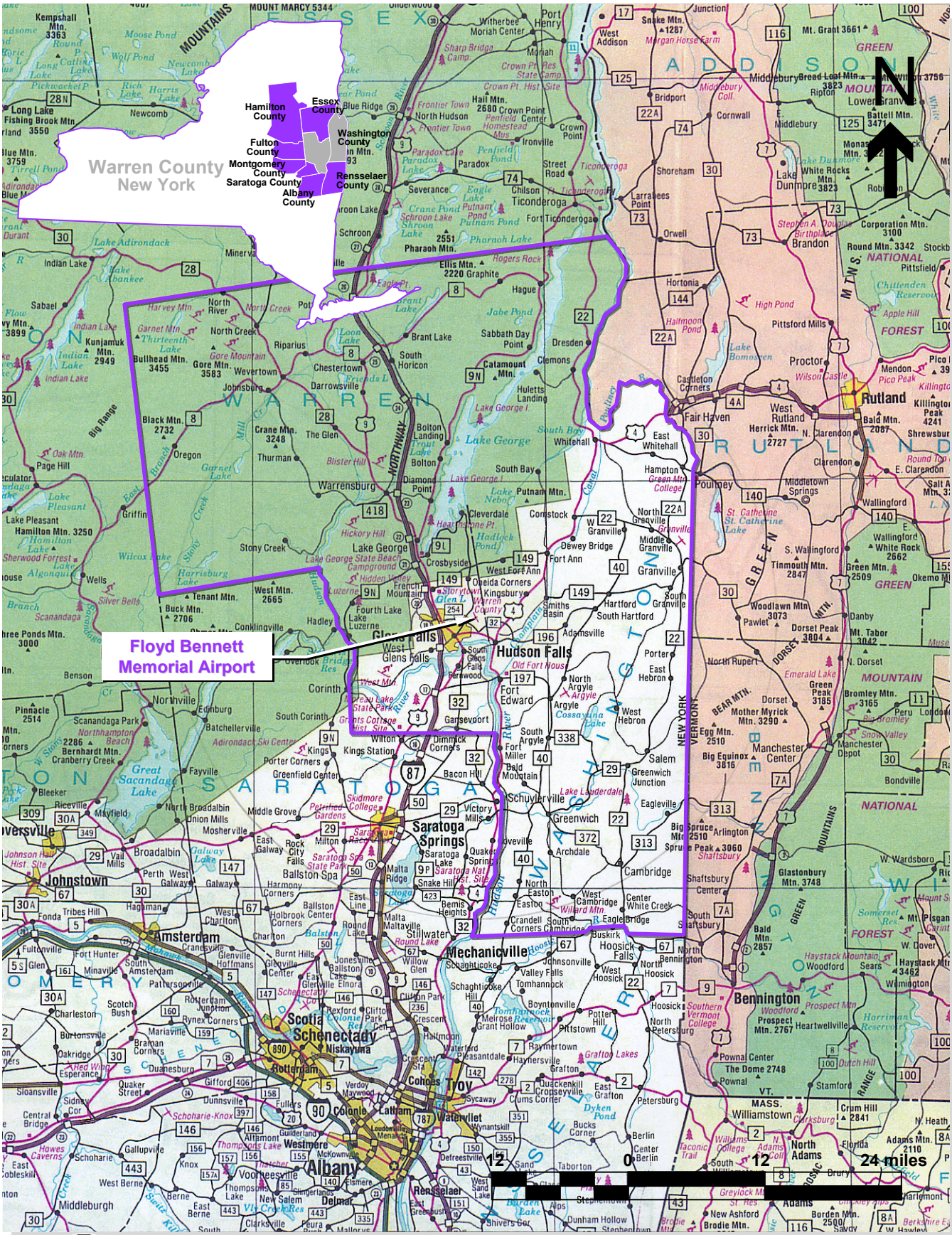
Floyd Bennett Memorial Airport, (elevation 328 feet above mean sea level) is a transport-category facility which accommodates aircraft from Airplane Design Groups I and II and Aircraft Approach Categories A, B, C and D. (See photo 1) The facility has been planned and designed as a transport-category facility according to Federal Aviation Administration Advisory Circular (AC) 150/5300-13, *Airport Design*, to accommodate Airport Reference Code D-II aircraft, those having approach speeds from 141 knots up to 166 knots with wing spans up to, but not including, 79 feet.

Photo 1- Floyd Bennett Memorial

The geographic location of the airport is latitude 43-20-28.4 North, longitude 073-36-37.1 West, about 3 miles northeast of the City of Glens Falls. The airport, shown on Figures 2-1 and 2-2, is set on approximately 628 acres of a relatively flat area.

2.02 Socio Economic Conditions

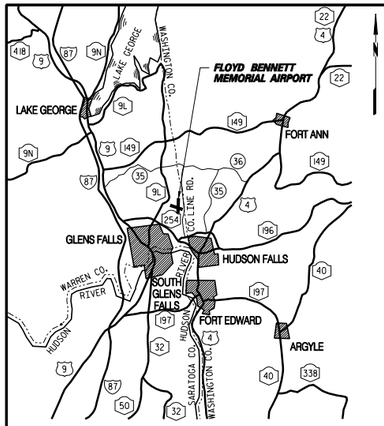
This section focuses on socioeconomic data compiled for Warren, Washington and northern Saratoga Counties. Chart 2-1 presents a brief history of population and employment statistics for the study area and shows that population and employment grew steadily from 1990 to 2000. Moderate growth is anticipated for the socioeconomic indicators through the forecast period. The employment in Washington County is the one exception, and is expected to decline by approximately 3% over the forecast period. These forecasts were prepared by the Wharton Econometric Forecasting Associated Group (WEFA) and commissioned by NYSDOT based on an econometric model for the region and New York State.



Floyd Bennett Memorial Airport

Study Area

Figure 2-1



LOCATION MAP

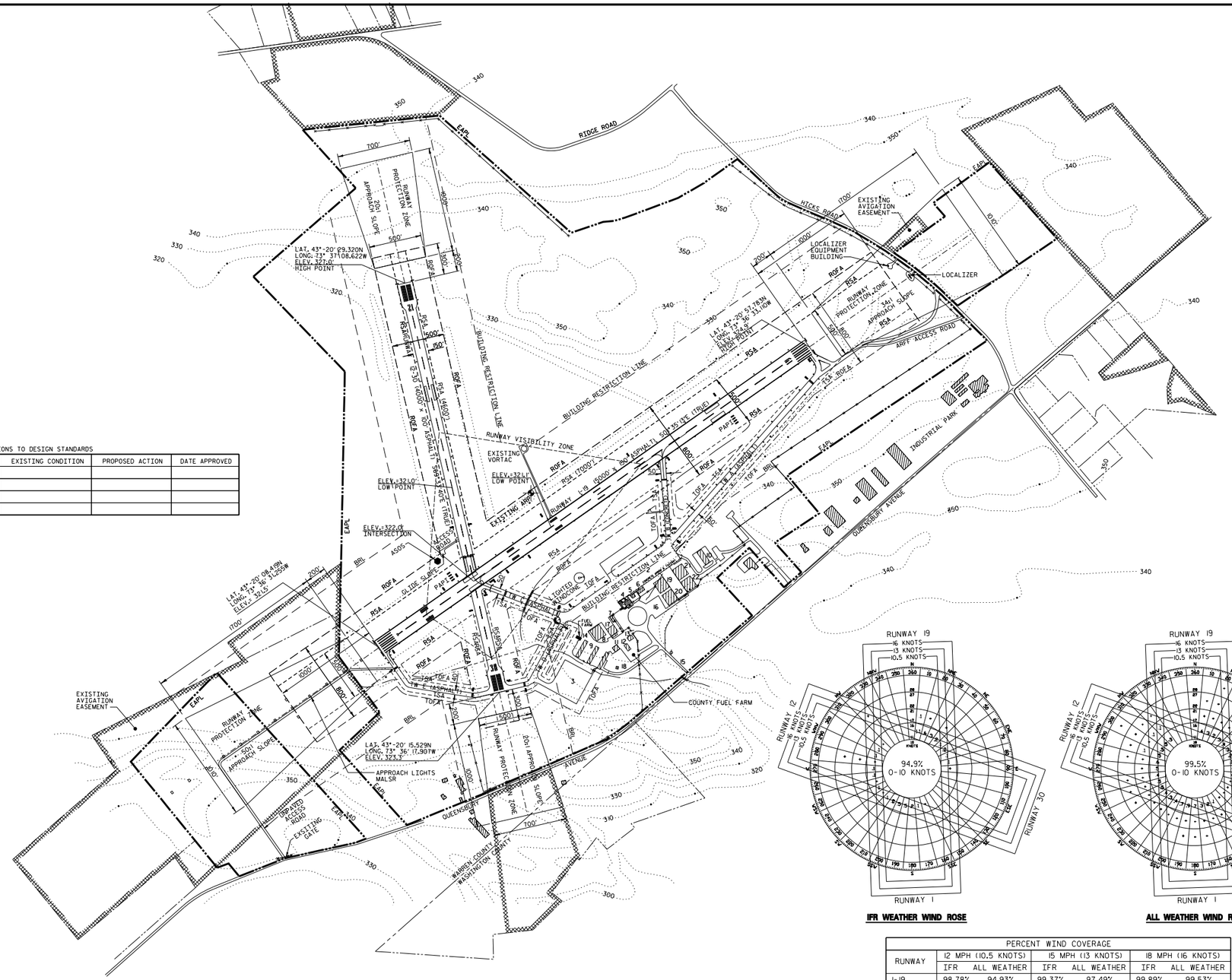
NOT TO SCALE

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH	500'	150'
	LENGTH	7,000'	4,600'
ROFA	WIDTH	800'	500'
	LENGTH	7,000'	4,600'
TSA	WIDTH	118'	79'
TOFA	WIDTH	186'	131'

MODIFICATIONS TO DESIGN STANDARDS

NO.	STANDARD MODIFIED	FAA STANDARDS	EXISTING CONDITION	PROPOSED ACTION	DATE APPROVED

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGARS (3-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE HANGAR
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	MAINTENANCE HANGAR
18	LEACH FIELD
19	CONVENTIONAL HANGAR
20	CONVENTIONAL HANGAR
21	CONVENTIONAL HANGAR
22	CONVENTIONAL HANGAR



IFR WEATHER WIND ROSE

ALL WEATHER WIND ROSE

PERCENT WIND COVERAGE						
RUNWAY	12 MPH (10.5 KNOTS)		15 MPH (13 KNOTS)		18 MPH (16 KNOTS)	
	IFR	ALL WEATHER	IFR	ALL WEATHER	IFR	ALL WEATHER
1-19	98.78%	94.93%	99.37%	97.49%	99.89%	99.53%
12-30	96.07%	94.17%	97.68%	96.86%	99.67%	99.50%
COMBINED	99.67%	98.78%	99.96%	99.79%	100.00%	99.93%

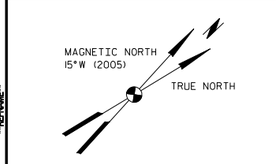
SOURCE: NATIONAL CLIMATIC DATA CENTER, ASHVILLE, NORTH CAROLINA
PERIOD COVERED: 1994-2003

FAR PART 77 CATEGORY	12 VISUAL 30 VISUAL	1 PRECISION 19 NON-PRECISION

NOTE:

MINIMUM SEPARATION DISTANCE FROM RUNWAY 1-19 TO PARALLEL TAXIWAY IS 400'

• LATITUDE / LONGITUDE AND ELEVATION DATA IS FROM FAA FORM 5010 (4-20-2000)



"HERNAME"

AIRPORT DATA

ITEMS	EXISTING
AIRPORT ELEVATION (MSL) •	328'
REFERENCE POINT (ARP) LAT. •	43°20'28.356" N
REFERENCE POINT (ARP) LONG. •	73°36'37.107" W
MEAN MAXIMUM TEMPERATURE	79°F
MAGNETIC VARIATION (YEAR)	15°W (2005)
AIRPORT CATEGORY	TRANSPORT
CRITICAL AIRCRAFT / ARC	DC-9 / CIII
AIRPORT NAVAIDS	VORTAC, ROTATING BEACON, DIRECTION FINDER, LIGHT WINDCONE

RUNWAY DATA

ITEMS	RUNWAY 1 - 19	RUNWAY 12 - 30
	EXISTING	EXISTING
PHYSICAL LENGTH & WIDTH	5000' X 150' (ASPHALT-GROOVED)	4000' X 100' (ASPHALT)
EFFECTIVE GRADIENT (%)	0.1%	0.15%
WIND COVERAGE (%) (13 KNOTS)	97.49%	96.86%
PAVEMENT STRENGTH (000 LBS.)	SW80, DW110, DTW 180	SW39, DW53, DTW 76
APPROACH SURFACES	RW1- 50:1/RW19 - 34:1	20:1
RUNWAY LIGHTING	HIRL	MIRL
RUNWAY MARKING	PRECISION INSTR.(1) NON-PRECISION INSTR.(19)	BASIC (12-30)
NAVIGATION AIDS	ILS, TVOR, VASI	

LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
CONTOUR LINE	800
RUNWAY SAFETY AREA (RSA)	RSA
EXISTING EASEMENT LIMIT	
EXISTING FENCE	

REVISIONS

BY	DATE	CHANGE

FIGURE 2-2

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

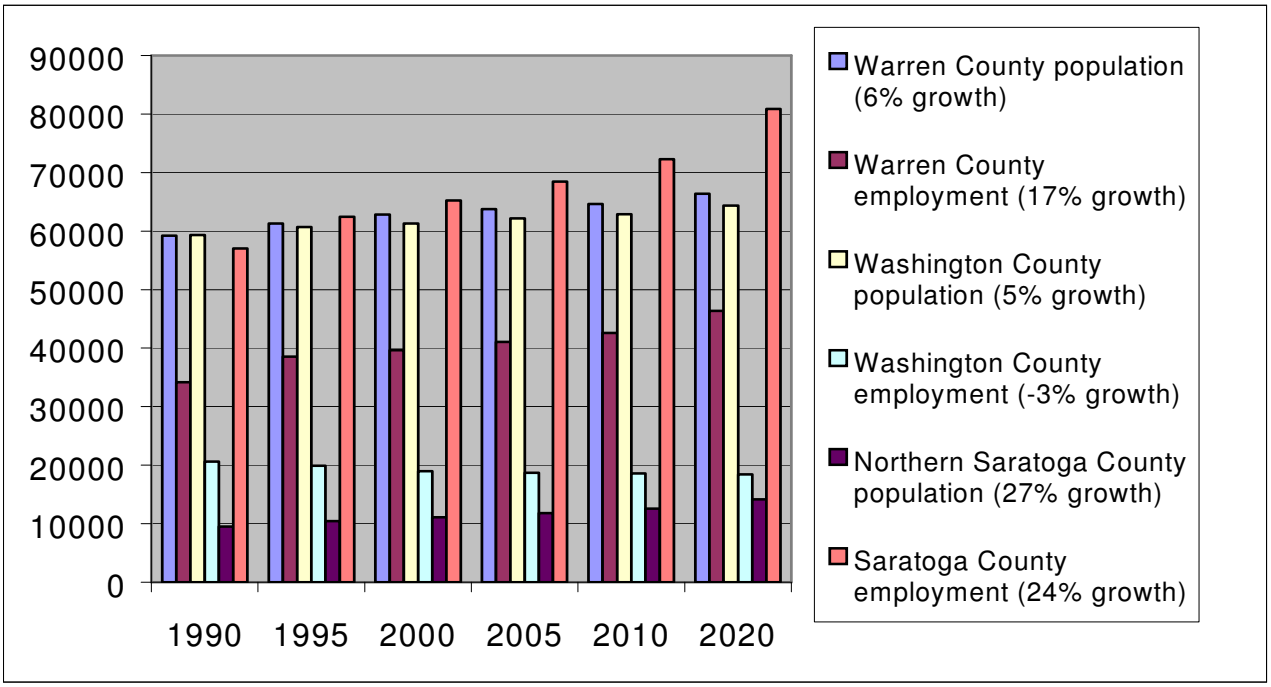
EXISTING AIRPORT LAYOUT

DESIGNED: JCT	DRAWN: JCT	SHEET 2 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP04.DGN	

C&S COMPANIES

F:\Project\107 - Warren County\10701601\cadd\10701601\1629ap04.dgn

CHART 2-1
SOCIOECONOMIC FORECAST



Source: NYSDOT, Special Forecasts prepared by the WEFA Group 9/99

Anchored by Lake George, the "Queen of the American Lakes," Warren County is a world-renowned vacation destination with an estimated 7.6 million visitors annually. The Adirondack Mountains, lakes, river, historic and cultural sites afford plentiful recreation opportunities. The powerful impact of the tourism industry drives employment figures in Warren County. This is seen in the large size of the services and retail sectors of employment. These sectors are broken down into jobs, which include retail sales and service, restaurant, and food service jobs. The service industry in Warren County is divided into jobs for hotel, real estate, health, business and personal supply service.

A breakdown of employment by sector Warren, Washington, and Saratoga counties indicates that services, retail and manufacturing account for over 57% of the total employment, playing a major role in the economy of the tri-county area. The remainder of the three counties' employment is comprised of construction, transportation, health care, education, administration, utilities, wholesale, and financial services.

2.03 Climate

Warren County climate is described by the Warren County, New York Soil Survey published by the United States Department of Agriculture: Soil Conservation Service. The publication states that:

In Warren County winters are cold and summers are moderately warm and have occasional hot spells. The Adirondack Mountains are markedly cooler than the main agricultural areas

in the lowlands. Precipitation is well distributed throughout the year and is nearly always adequate for all crops. Winter snows occur frequently, occasionally as blizzards, and cover the ground much of the time. Table 2-1 summarizes annual averages for the Warren County climate.

TABLE 2-1
WARREN COUNTY CLIMATE

Temperature						Precipitation					
Ave. temp. Win.	Ave. low Win.	Ave. temp. Sum.	Ave. high Sum	Rec. high	Rec. low	Annual rainfall	Rec. 1 day rain	Annual snowfall	Relative humidity	% sun- winter	% sun- summer
21	12	68	79	99	-33	35in.	3.65in.	66in.	55%	45%	60%

Source: C&S Engineers, Inc.

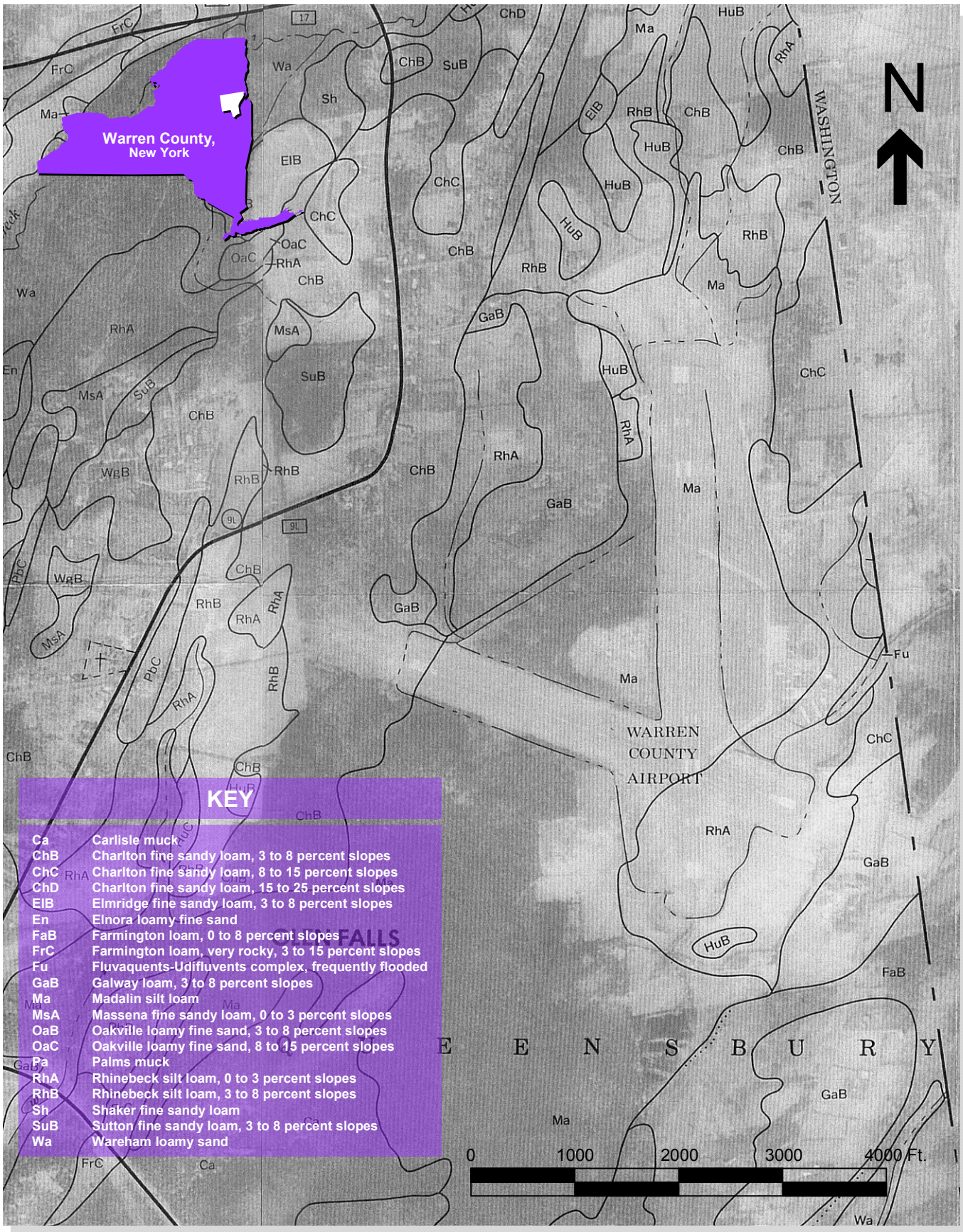
2.04 Topography

The Warren County Soil Survey provides the following information on Warren County's topography.

Warren County is in the eastern part of New York. Its land area is 565,120 acres. The county is bounded on the north by Essex County, on the east by Washington County, and the south by Saratoga County, and on the west by Hamilton County. The elevation of the county ranges from 300 feet above sea level at the Warren County airport to 3,583 feet at the top of Gore Mountain. In 1990 the population of Warren County was 59,209, and 64 percent of the population was living in the southeast corner of the county in the city of Glens Falls and the town of Queensbury. Approximately 93 percent of Warren County is woodland. Of the total woodland area, about 340,000 acres is commercial forest land and about 185,000 acres is noncommercial. About 93 percent of Warren County is within the boundary of the Adirondack Park.

2.05 Soils

A soils map (see Figure 2-3) depicts and identifies the specific soils found in the vicinity of Floyd Bennett Memorial Airport. A sizable portion of airport property south and west of Runway 1-19 is Madalin silt loam (Ma), this soil has a high content of silt and clay and is poorly drained. The water table is at or near the surface year around and permeability of the soil is low. The organic content of Madalin soil is higher than average and soil conditions create a wetland habitat. Water management is difficult on Madalin soil. It has severe limitations for embankments, drainage and aquifer-fed ponding areas because it is wet, erodes easily and percolates slowly. This creates a concern at the airport for the proper siting of development and the grading and drainage of safety areas.



C&S COMPANIES®

Floyd Bennett Memorial Airport

Soils Map

Figure 2-3

2.06 Floyd Bennett Memorial Airport

The following section discusses the various types of general aviation aircraft that utilize the airport. Aircraft characteristics and operation levels are identified in order to understand the aviation activity found at the airport. The term "general aviation" refers to all flying aircraft except military or commercial aircraft activity. Typically, the measure of based aircraft and annual operations are used to gauge general aviation aeronautical activity. Refer to Appendix C for a glossary of terms used in this study.

2.06-1 General Aviation

Empire East Aviation is a full service Fixed Base Operator (FBO) at the airport that provides the following general aviation services: fuel, aircraft maintenance, rental cars, reservation service, sightseeing tours/rides, 24-hour on-call service, parts and accessories and flight instruction.

2.06-2 General Aviation Aircraft Statistics

Based aircraft are general aviation aircraft that are permanently located at the Airport. According to the FAA Terminal Area Forecast (FAATAF), the aircraft based at the airport in 1980 numbered 50. The based aircraft dropped to 43 in 1985, and then rebounded to 59 aircraft in 1990. In the last 10 years the number of based aircraft has fluctuated and has risen to the current 61 aircraft at the airport. The numbers of based aircraft currently at the airport were obtained from Empire East Aviation, the Fixed Base Operator, and are listed in Table 2-2.

TABLE 2-2
BASED AIRCRAFT

Single Engine	57
Multi Engine	3
Jet	1
Total	**61**

Source: Empire East Aviation

Table 2-3 presents the characteristics of the based aircraft found at the Airport.

TABLE 2-3
GENERAL AVIATION BASED AIRCRAFT CHARACTERISTICS

Model	Maximum T/off Weight (lbs.)	Approach Speed (knots)	Wingspan (feet)	Approach Category	Design Group
Cessna-150[1]	1,600	55	32.7	A	I
Beechcraft Baron[2]	5,100	90	37.8	A	I
Cessna Citation-100 Bravo[3]	14,800	112	52.2	B	II

1 - Single Engine Aircraft
2 - Twin Engine Aircraft
3 - Jet Aircraft

Source: C&S Engineers, Inc.

General aviation operations experienced a slump in the mid-1990's, consistent with a nation-wide decline in GA activity. However, as shown in Table 2-4, operations at the Airport are making a strong comeback, from 10,110 operations in 1995, according to the FAA TAF, to 37,000 in 1999 according to a C&S estimate, based on fuel sales, and current 2004 FAA TAF.

TABLE 2-4
GENERAL AVIATION OPERATIONS

Year	Operations
1985	23,303
1990	13,362
1995	10,110
1999	*37,000

*estimate based on fuel sales

Source: FAA TAF

2.06-3 Critical Aircraft

The appropriate airport design criteria is based primarily on the selection of a critical or design aircraft that is expected to, or already does use the airport routinely. The 1991 Airport Master Plan identified the DC-9-30 as the critical aircraft for Floyd Bennett Memorial Airport. The DC-9-30 has an Airport Reference Code (ARC) of C-III. Part of the planning process includes a re-evaluation of the critical aircraft to determine if another aircraft more accurately addresses the aviation demands of the airport and should be designated as the critical aircraft. See section 4.01 for an evaluation of the critical aircraft to be selected as the design aircraft for the Airport.

According to FAA Advisory Circular 5300-13, *Airport Design,* aircraft are grouped into five categories based upon their certified approach speed.

a) Category A: Speed less than 91 knots;
b) Category B: Speed 91 knots or more but less than 121 knots;
c) Category C: Speed 121 knots or more but less than 141 knots;
d) Category D: Speed 141 knots or more but less than 166 knots;
e) Category E: Speed 166 knots or more.

Approach Categories A and B include small, propeller aircraft and certain smaller business jets all which have approach speeds of less than 121 knots. Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use. Aircraft utilizing Floyd Bennett Memorial Airport currently fall into Category D or below.

The same advisory circular also indicates six Airplane Design Groups according to the physical size of the aircraft.

a) Airplane Design Group I: Wingspan up to but not including 49 feet (15m);
b) Airplane Design Group II: Wingspan 49 feet (15m) up to but not including 79 feet (24m).
c) Airplane Design Group III: Wingspan 79 feet (24m) up to but not including 118 feet (36m);
d) Airplane Design Group IV: Wingspan 118 feet (36m) up to but not including 171 feet (52m);
e) Airplane Design Group V: Wingspan 171 feet (52m) up to but not including 197 feet (60m);
f) Airplane Design Group VI: Wingspan 197 feet (60m) up to but not including 262 feet (80m).

The airplane's wingspan is the principal characteristic affecting design standards. General aviation and business jet aircraft using Floyd Bennett Memorial Airport currently fall into Groups I and II with wingspans less than 79 feet.

2.07 Airport Design Standards

FAA Advisory Circular 150/5300-13, *Airport Design*, identifies the design standards to be maintained at the Airport. These design criteria provide a guide for airport designers to assure a reasonable amount of uniformity in airport landing facilities. Any criteria involving widths, gradients, separations of runways, taxiways, and other features of the landing area must necessarily incorporate wide variations in aircraft performance, pilot technique, and weather conditions. The FAA design standards provide for uniformity of airport facilities and also serve as a guide to aircraft manufacturers and operators with regard to the facilities which may be expected to be available in the future.

The specific airport design standards listed below (Table 2-5) have been applied assuming aircraft usage by Airplane Design Group III (wingspans up to but not including 118 feet) for Runway 1-19 and show the existing conditions at the Airport.

TABLE 2-5
AIRPORT DESIGN STANDARDS-RUNWAY 1-19

Item Design Criteria:	Design Standards R/W 1-19 C-III	Existing Conditions
Runway Width	100'	150’
Runway Centerline to Taxiway Centerline	400’	NA-RW 1-19 has access taxiways
Aircraft Parking Area	500'	500’
Taxiway Width	50'	50’
Taxiway Safety Area Width	118’	118’
Taxiway Object Free Area Width	186'	186’
Runway Safety Area		
- Width	500'	500’
- Length (beyond runway end)	1000'	1000’
Runway Object Free Area		
- Width	800'	800’
- Length (beyond runway end)	1000'	1000’

Source: FAA Advisory Circular 150/5300-13 and C&S Engineers, Inc.

Design standards for aircraft usage by Airplane Design Group II, with wingspans up to but not including 79 feet are used for Runway 12-30. The FAA does permit an airport with two or more runways to have more than one ARC. It is not necessary to apply the design standards of Runway 1-19 to the crosswind Runway 12-30 based on the most likely users of the runway being small (12,500 pounds or less) aircraft. The design standards for Runway 12-30 are outlined and compared to existing conditions in Table 2-6.

TABLE 2-6
AIRPORT DESIGN STANDARDS-RUNWAY 12-30

Item Design Criteria:	Design Standards R/W 12-30 B-II	Existing Conditions
Runway Width	75'	100’
Runway Centerline to Taxiway Centerline	240'	240’
Aircraft Parking Area	250'	500’
Taxiway Width	35'	40’
Taxiway Safety Area Width	79'	79’
Taxiway Object Free Area Width	131'	131’
Runway Safety Area		
- Width	150'	150’
- Length (beyond runway end)	300'	300’
Runway Object Free Area		
- Width	500'	500’
- Length (beyond runway end)	300'	300’

Source: FAA Advisory Circular 150/5300-13 and C&S Engineers, Inc.

2.07-1 Safety Areas

Runways are surrounded by rectangular areas known as "runway safety areas." These areas should have slopes ranging from 1% to 5%, and as discussed in AC 150/5300-13, should be graded and free of obstructions to "enhance the safety of airplanes which undershoot, overrun, or veer off the runway, to minimize the probability of serious damage to airplanes accidentally entering the area, and to provide greater accessibility for fire fighting and rescue equipment during such incidents." The applicable runway safety area (RSA) dimensions for Floyd Bennett Memorial Runways 1-19 and 12-30 are shown in Tables 2-5 and 2-6.

The safety area for Runway 19 is standard. The safety area on the Runway 1 end is sub-standard due to a ditch located approximately 325 feet from the end of the runway. The safety areas for Runway ends 12 and 30 are within standard for size but do not meet grading requirements.

2.07-2 Object Free Areas

Runways are also surrounded by rectangular areas known as object free areas (OFA). The OFA must be clear of objects except those whose location is fixed by function. The purpose of the OFA is to provide safe and efficient operations at the Airport. The applicable OFA width for Runway 1-19 is 800 feet centered on the runway centerline and 1,000 feet beyond each runway end based on an ARC of D-II. The OFA for Runway 12-30 is 500 feet wide centered on the runway centerline and 300 feet beyond the runway ends based on an ARC of B-II.

2.07-3 Runway to Taxiway Centerline Separation Distance

The precision instrument runway to parallel taxiway centerline separation standard, for an Airport Reference Code D-II airport, is 300 feet. This distance ensures that the tail tip or wing tip of an aircraft on the taxiway centerline will not penetrate the space above the runway safety area.

Runway 1-19 does not have a parallel taxiway. However, Taxiways A, D and E serve the same function as a parallel taxiway. Taxiway A is an access taxiway that runs from the northern terminal apron to the Runway 19 end. Taxiways D and E are stem taxiways that attach the terminal area to the Runway 1 end. Taxiway A's separation to the runway centerline is at least 300 feet. Runway 12-30 also has no parallel taxiway.

2.07-4 Runway Protection Zone (RPZ)

The RPZ is an area trapezoidal in shape and centered about the extended runway centerline. The function of the RPZ is to enhance the protection of people and property on the ground. It is desirable to clear all facilities supporting incompatible activities from the RPZ. Incompatible activities include, but are not limited to, those which lead to an assembly of people. The Runway 1 RPZ falls over cleared terrain with an access road to the approach lights for Runway 1. The Runway 19 RPZ falls over cleared terrain, which is owned by the Airport. A portion of the Runway 19 RPZ falls over a residential parcel. The RPZ for Runway 12 falls on cleared terrain owned by the Airport. The RPZ for Runway 30 falls on cleared terrain owned by the Airport and on commercial land use east of Queensbury Avenue. The dimensions for the runway protection zones are shown on Table 2-7.

Photo 2 – Conventional hangar

TABLE 2-7
RUNWAY PROTECTION ZONE DIMENSIONS

Runway	Dimensions
12	1,000 x 500 x 700
30	1,000 x 500 x 700
1	2,500 x 1,000 x 1,750
19	1,700 x 500 x 1,010

Source: C&S Engineers, Inc.

2.08 Hangars and Aircraft Parking Areas

Photo 3 – Inside of Conventional Hangar

Empire East, the Fixed Base Operator (FBO) operates from office space in the terminal building and a large conventional hangar (13,750 square feet) south of the terminal building (see Photo 2). The hangar is constructed out of metal and is in fair condition. However, the hangar is not heated or insulated making work conditions poor in the winter. Empire East indicated that the amount of maintenance space that they operate in is inadequate and that it would be useful to have adequate maintenance, administration, and airplane storage space in one building (see Photo 3). Southeast of the terminal building are two T-hangars, 6 bays each. Both of these T-hangars are in poor condition and need to be replaced or rehabilitated. In addition there is failed pavement around both of the hangars. North of the terminal building is one 6-bay T-hangar, which was constructed in 1999 and is in excellent condition. Refer to Table 2-13 for a summary of the facilities and their condition.

The terminal apron is divided into a northern section that is approximately 15,500 SY. This apron is made out of concrete and is currently being rehabilitated. The southern terminal apron is approximately 9,800 SY constructed with asphalt and in excellent condition. The southern apron is designated as the transient aircraft tie-down area. The fuel farm, which is owned by the County and operated by Empire East, was installed in 1999 and is adjacent to this apron. Taxiways A, B, C and D link the terminal aprons to the airfield.

The based aircraft tie-down apron is a relatively new apron constructed in 1995. This apron is 10,300 SY and in excellent condition. Included in the apron is signage and barriers and a bridge linking the vehicle parking area with the aircraft tie down area. The apron is linked to the terminal area and Runway 30 with Taxiway D.

2.09 Aircraft Fuel Storage Facilities

The county-owned aircraft fuel storage facilities are located south of the terminal building and west of the existing T-hangars. Fuel storage is centrally located to the large conventional hangar, the terminal apron and the based aircraft apron via taxiway D.

Aviation fuel storage (Photo 4) at the airport is handled by the fixed base operator.

TABLE 2-8
AVIATION FUEL STORAGE

Fuel Farm	Gallons
Avgas LL (gals.)	10,000
Jet A (gals.)	10,000

Source: C&S Engineers, Inc.

Photo 4 – Fuel Storage Facilities

2.10 Critical Obstructions

Federal Aviation Regulations (FAR) Part 77*, Objects Affecting Navigable Airspace*, outlines dimensions and criteria used in determining imaginary surfaces on and around an airport through which no object should penetrate. These approach, horizontal, conical, and transitional surfaces are depicted in the 2001 Obstruction Study completed by C&S Engineers, Inc. This obstruction study identifies controlling obstructions for each runway end. The following controlling obstructions exist at Floyd Bennett Memorial Airport:

- Runway 1 (elevation 322 feet) - A group of trees with an elevation of 435 feet is located 1,485 feet out from the Runway 1 end and 900 feet to the left, with a 52-foot penetration of the transitional surface.

- Runway 19 (elevation 325 feet) – A group of trees with an elevation of 417 feet is located 1,500 feet out from the Runway 19 end and 315 to 810 feet to the left with a 65-foot penetration of the approach surface.

- Runway 12 (elevation 327 feet) – A tree with an elevation of 430 feet is located 2,485 feet out from the Runway 12 end, and 305 feet to the right, and is 10-feet under the approach surface.

- Runway 30 (elevation 323 feet) – Three trees with an elevation of 399 feet are located 1025 feet out and 115-610 feet to the left of the runway centerline with a 37-foot penetration of the approach surface.

This critical obstruction analysis is based on the Obstruction Study completed in 2001.

2.11 Threshold Siting Analysis

FAA Advisory Circular 150/5300-13 CHG 6, ***Airport Design, Appendix 2, Threshold Siting Requirements***, states that a "runway threshold should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object that obstructs the airspace required for landing airplanes is beyond the airport authority's power to remove, relocate, or lower."

"Displacement of a threshold reduces the length of runway available for landings. Depending on the reason for displacement of the threshold, the portion of the runway behind a displaced threshold may be available for take-off in either direction and landing from the opposite direction."

The standard shape, dimensions, and slope of the surface used for locating a threshold is dependent upon the type of aircraft operations currently conducted or forecasted, the landing visibility minimums desired, and the types of instrumentation available or planned for that runway end. The Threshold Siting Surface categories for each of the runway ends are defined as follows:

Runway 1:

Threshold siting surface dimensions and slope are keyed to the runway ends, and are dependent upon the type of aircraft operations currently conducted or forecasted and the landing visibility minimums desired, and the types of instrumentation available or planned for that runway end. The current ILS-Category I minimums for Runway 1 are 574 feet for the Decision Height ceiling and 1 mile for visibility. The Threshold Siting Surface runway type for this runway is Category G, and is defined as follows: *"For Approach End of Runways Expected to Accommodate Instrument Approaches Having Visibility Minimums Less than 3/4 Mile, or a Precision Approach (Day or Night). 1) No object should penetrate a surface that starts 200 feet out from the threshold and at the elevation of the runway centerline at the threshold and slopes upward from the starting point at a slope of 34 (horizontal) to 1 (vertical). 2) In the plan view, the centerline of the surface extends 10,000 feet along the extended runway centerline. This surface extends laterally 400 feet on each side of the centerline at the starting point and increases in width to 3800 feet at the far end of this surface."*

Runway 19:

The current non-precision approach minimums for Runway 19 are 860 feet for the minimum decent altitude and 1 mile visibility for Aircraft Approach Category A and B; 860 feet for the minimum decent altitude and 1½ miles visibility for Aircraft Approach Category C; and 860 feet for the minimum decent altitude and 1¾ miles visibility for Aircraft Approach Category D. Runway 19 has a published straight-in approach, therefore the Threshold Siting Surface Runway Type which should be applied for this runway is Category E, and is defined as follows: *"For Approach End of Runways Expected to Support Instrument Straight-in Night*

Operations." 1) No object should penetrate a surface that starts 200 feet out from the threshold and at the elevation of the runway centerline at the threshold and slopes upward from the starting point at a slope of 20 (horizontal) to 1 (vertical). 2) In the plan view, the centerline of the surface extends 10,000 feet along the extended runway centerline. This surface extends laterally 400 feet each side of the centerline at the starting point and increases in width to 1900 feet, each side of the centerline, at the far end of this surface.

Runways 12 and 30:

Both Runways 12 and 30 can support circling night approaches from either published procedure for Runway 1 or Runway 19. Therefore, Category D Runway Type Threshold Siting Surface requirements should be applied for this runway, and are defined as follows: *"For Approach End of Runways Expected to Support Instrument Night Circling." 1) No object should penetrate a surface that starts 200 feet out from the threshold and at the elevation of the runway centerline at the threshold and slopes upward from the starting point at a slope of 20 (horizontal) to 1 (vertical). 2) In the plan view, the centerline of the surface extends 10,000 feet along the extended runway centerline. This surface extends laterally 200 feet each side of the centerline at the starting point and increases in width to 1700 feet, each side of the centerline, at the far end of this surface.*

The following threshold siting analysis is based on the Obstruction Study completed in 2001 and considers existing conditions at the airport:

Runway 1:

An analysis using the Threshold Siting Requirements for the Runway 1 End, at a threshold siting slope of 34:1 and Category G Threshold Siting Surface dimensions reveals that obstructions are encountered. Obstruction 1-5 consists of approximately 5 acres of tree canopy, has a highest tree elevation of 431.6, and is located on county property. Obstruction 1-6 consists of approximately 40 acres of tree canopy of which approximately 30 acres is located on county property. These obstructions will need to be removed to keep the runway 1 threshold at the present location.

The extent of displacement of the Threshold Siting Surface was determined to clear the obstruction having the greatest penetration into the surface. The critical obstruction is identified as obstruction 1-5 and consists of trees. The maximum tree elevation within the siting surface is 431.6 feet, located 2,909 feet from the runway end and approximately 620 feet left of the extended runway centerline, and penetrates the Threshold Siting Surface by 30.4 feet. This obstruction creates an approximate displacement in the location of the threshold by 1,034 feet (30.4 ft. penetration x the 34:1 slope = 1033.6 ft.), which results in a usable runway length of 3,966 feet. Removal of obstructions is recommended as the full length runway is necessary to accommodate aircraft currently operating at the airport.

Runway 12:

An analysis to locate the threshold at the Runway 12 End, at a threshold siting slope of 20:1 and a Category D Threshold Siting Surface, reveals that no obstructions are encountered to

the threshold siting surface. Therefore, no displacement of the threshold presently located at the runway end would be required.

Runway 19:

An analysis using the Threshold Siting Requirements for the Runway 19 End, at a threshold siting slope of 20:1 and a Category E Threshold Siting Surface, reveals that obstructions are encountered. The Threshold Siting Surface was displaced to clear the obstruction having the greatest penetration into this surface. The critical obstruction is identified as a tree canopy peak elevation in obstruction 19-8 consisting of trees. The critical obstacle elevation within the Threshold Siting Surface is 413.1 feet, located 1,617 feet from the runway end, and approximately 530 feet left of the extended runway centerline. Based on this data, the Runway 19 Displaced Threshold would need to be located approximately 347 feet from the runway end. In displacing the threshold, another critical obstacle was encountered. This tree canopy peak elevation in obstruction 19-8 has an elevation of 427.5 feet, is located 1,240 feet from the Runway 19 end and approximately 590 feet left of the extended runway centerline, and penetrates the Threshold Siting Surface by 50.6 feet. As a result, the runway threshold would need to be displaced approximately 1,012 feet (50.6 ft. penetration x the 20:1 slope = 1,012 ft.), which results in a usable runway length of 3,988 feet.

Runway 30:

An analysis using the Threshold Siting Requirements for the Runway 30 End, at a threshold siting slope of 20:1 and a Category D Threshold Siting Surface, reveals that obstructions are encountered. The Threshold Siting Surface was displaced to clear the obstruction having the greatest penetration into this surface. The critical obstruction is identified as a tree canopy peak elevation in obstruction 30-11 consisting of trees. The critical obstacle elevation within the Threshold Siting Surface is 381.3 feet, located 890 feet from the runway end, and approximately 300 feet left of the extended runway centerline. Based on this data, the Runway 30 Displaced Threshold would need to be located approximately 470 feet from the runway end. In displacing the threshold, another critical obstacle was encountered. This tree canopy peak elevation in obstruction 30-11 has an elevation of 399.8 feet, is located 1,090 feet from the Runway 30 end and approximately 360 feet left of the extended runway centerline, and penetrates the Threshold Siting Surface by 32.0 feet. As a result, the runway threshold would need to be displaced approximately 640 feet (32.0 ft. penetration x the 20:1 slope = 640 ft.), which results in a usable runway length of 3,360 feet.

2.12 Airspace

In order to delineate facilities and airspace meriting examination in relation to the airport and its airspace requirements, a 25 nautical-mile (NM) radius circle was constructed around the project site (see Figure 2-4). The airspace within this area includes several airports that can handle general aviation, while others are private/restricted fields and cannot be expected to provide reliever capability.

LEGEND

Airports having Control Towers are shown in Blue, all others in Magenta. Consult Airport/Facility Directory (A/FD) for details involving airport lighting, navigation aids, and services.

AIRPORTS

Other than hard-surfaced runways

Seaplane Base

Hard-surfaced runways 1500 ft. to 8069 ft. in length

Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.

All recognizable hard-surfaced runways, including those closed, are shown for visual identification.

ADDITIONAL AIRPORT INFORMATION

Private "(Pvt)" – Non-public use having emergency or landmark value

Military – Other than hard-surfaced. All military airports are identified by abbreviations AFB, NAS, AAF, etc. For complete airport information consult DOD FLIP

(H) Heliport-Selected Public

(U) Unverified

Abandoned – paved, having landmark value, 3000 ft. or greater

(F) Ultralight Flight Park Selected

Services – fuel available and field tended during normal working hours depicted by use of ticks around basic airport symbol. (Normal working hours are Mon thru Fri 10:00 A.M. to 4:00 P.M. local time.) Consult A/FD for service availability at airports with hard-surfaced runways greater than 8069 ft.

Rotating airport beacon in operation Sunset to Sunrise.

AIRPORT DATA

F.A.R. 91 – Airport Surveillance Radar

F.A.R. 93

FSS – NO SVFR – (NAME) (NAM) – Location Identifier

CT – 118.3* (C)

ATIS 123.8

285 L 72 122.95 – UNICOM

VFR Advsy 125.0 – Airport of entry

FSS – Flight Service Station

RFSS – Remote Flight Service Station(Canada)

NO SVFR – Fixed-wing special VFR flight is prohibited.

CT – 118.3 – Control Tower (CT) – primary frequency

NFCT – Non-Federal Control Tower

* – Star indicates operation part-time (see tower frequencies tabulation for hours of operation).

(C) – Indicates Common Traffic Advisory Frequencies (CTAF)

ATIS 123.8 – Automatic Terminal Information Service

AWOS-3 135.425 – Automated Weather Observing System

UNICOM – Aeronautical advisory station

VFR Advsy – VFR Advisory Service shown where ATIS not available and frequency is other than primary CT frequency

285 – Elevation in feet

L – Lighting in operation Sunset to Sunrise

*L – Lighting limitations exist, refer to Airport/Facility Directory.

72 – Length of longest runway in hundreds of feet; usable length may be less.

When facility or information is lacking, the respective character is replaced by a dash. All lighting codes refer to runway lights. Lighted runway may not be the longest or lighted full length. All times are local.

RADIO AIDS TO NAVIGATION AND COMMUNICATION BOXES

VHF OMNI RANGE (VOR)

VORTAC

VOR-DME

Non-Directional Radiobeacon

Marine Radiobeacon – RBn – POINT LOMA 302 – H+00 & ev 6m

Other facilities, i.e., Commercial Broadcast Stations, FSS Outlets-RCO, etc.

122.1R 122.6 123.6 – OAKDALE (T) – 352 *116.8 OAK

Underline indicates no voice on this freq

★ – Operates less than continuous or On-Request.

(T) – TWEB ■ – HIWAS

R – Receive only

122.1R – MIAMI – Controlling FSS

122.1R – CHICAGO CHI

Heavy line box indicates Flight Service Station (FSS). Freqs. 121.5, 122.2, 243.0, and 255.4 (Canada – 121.5, 126.7 and 243.0) are normally available at all FSSs and are not shown above boxes. All other freqs. are shown.

For Local Airport Advisory use FSS freq 123.6

In Canada, all available RFSS frequencies are shown.

Frequencies above thin line box are remoted to NAVAID site. Other freqs. at controlling FSS may be available as determined by altitude and terrain. Consult Airport/Facility Directory for complete information.

AIRPORT TRAFFIC SERVICE AND AIRSPACE INFORMATION

Only the controlled and reserved airspace effective below 18,000 ft. MSL are shown on this chart. All times are local.

Class B Airspace/Canadian Class C Airspace

Class C Airspace (Mode C See F.A.R. 91.215/AIM.)

Class D Airspace/Canadian Class C, D, or F Control Zone

(40) Ceiling of Class D Airspace in hundreds of feet/ceiling of Canadian Class C, D, and F Control Zone (A minus ceiling value indicates surface up to but not including that value.)

Class E Airspace/Canadian Class E Control Zone

Class E Airspace with floor 700 ft. above surface

Class E Airspace with floor 1200 ft. or greater above surface that abuts Class G Airspace.

2400 MSL / 4500 MSL – Differentiates floors of Class E Airspace greater than 700 ft. above surface

Class E Airspace low altitude Federal Airways are indicated by center line.

V3 270°

Intersection – Arrows are directed towards facilities which establish intersection.

Prohibited, Restricted, Warning and Alert Areas Canadian Advisory and Restricted Areas

MOA – Military Operations Area

Special Airport Traffic Areas (See F.A.R. Part 93 for details.)

MODE C (See F.A.R. 91.215/AIM.)

National Security Area

Terminal Radar Service Area (TRSA)

MTR – Military Training Routes

OBSTRUCTIONS

1000 ft. and higher AGL

below 1000 ft. AGL

or Group Obstruction

Obstruction with high-intensity lights May operate part-time

2049 (1149) UC – Elevation of the top above mean sea level; Height above ground; Under construction or reported; position and elevation unverified

NOTICE: Guy wires may extend outward from structures.

MISCELLANEOUS

1°E – Isogonic Line (1990 VALUE)

Ultralight Activity

Hang Glider Activity

Glider Operations

Fl ★ Flashing Light

Marine Light

NAME (Magenta, Blue, or Black) Visual Check Point

Parachute Jumping Area (See Airport/Facility Directory.)

TOPOGRAPHIC INFORMATION

Roads

Road Markers

Railroad

Bridges And Viaducts

Power Transmission Line

Aerial Cable

Landmark Feature – stadium, factory, school, golf course, etc.

Outdoor Theatre

Lookout Tower P-17 (Site Number) 618 (Elevation Base of Tower)

CG Coast Guard Station

Race Track

Tank–water, oil or gas

Oil Well ● Water Well

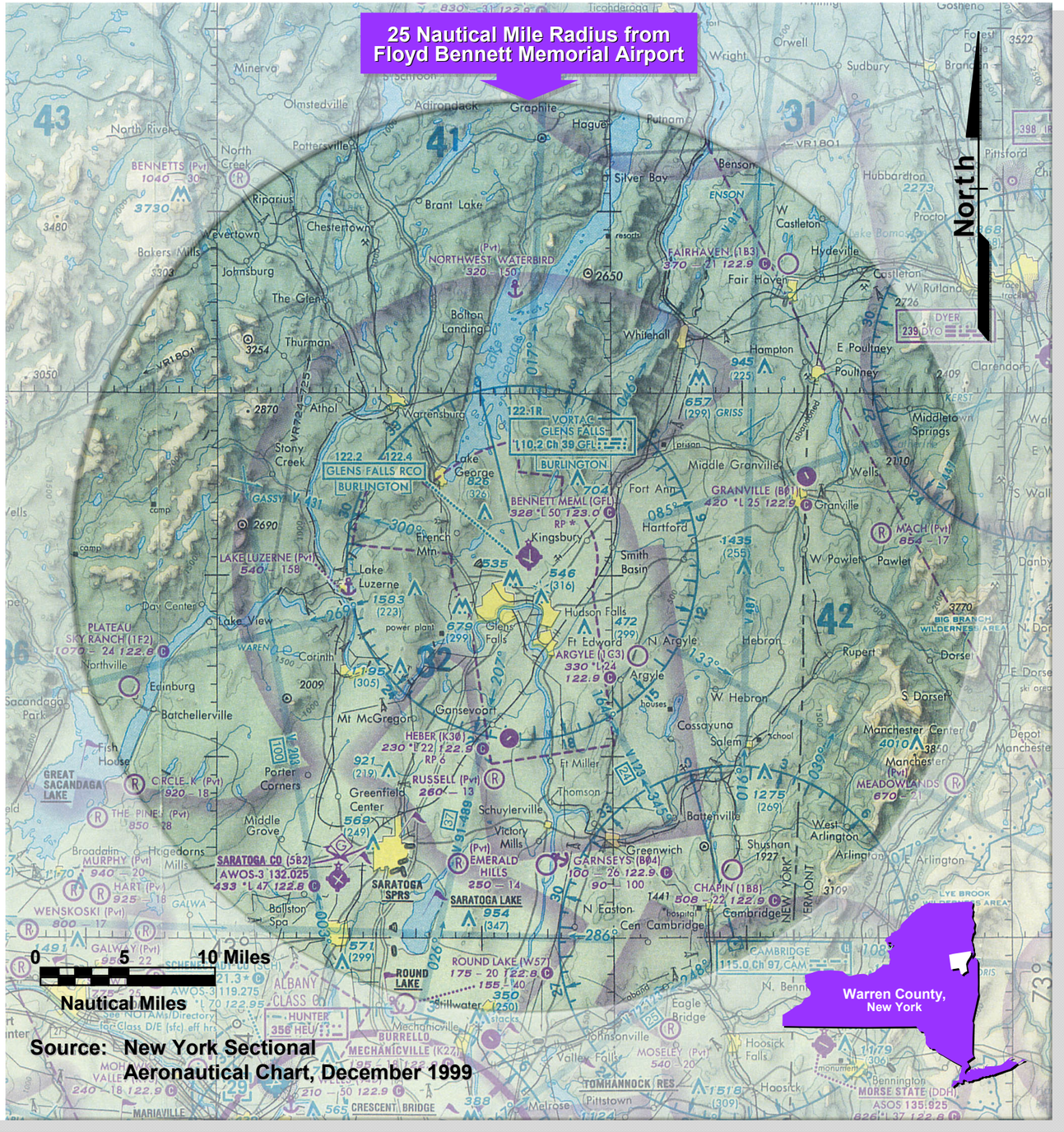
Mines And Quarries

Mountain Pass 11823 (Elevation of Pass)

Rocks – Pier – Dam

Perennial Lake

Non-Perennial Lake



Source: New York Sectional Aeronautical Chart, December 1999

C&S COMPANIES®

Floyd Bennett Memorial Airport

Airspace Environment and Adjacent Airports

Figure 2-4

Review of Figure 2-4 shows there is little airspace conflict between GFL and nearby airports. The closest facility is Argyle, a 2400' turf strip 8 nautical miles southeast of GFL. Saratoga County is 20.6 nautical miles southwest, Heber Airpark is 9.5 nautical miles south and Granville is 16 nautical miles northeast of GFL. All of these facilities are uncontrolled, general aviation fields with no airport control tower and relatively low levels of activity, except for Saratoga County Airport, which has over 30,000 estimated operations.

Appendix B lists the airports within a 25 NM radius circle around the project site. The private use fields have some use to local pilots as landmarks or emergency landing areas.

2.13 Approach Procedures

The existing use of airspace and airspace procedures available in the GFL area were determined by reviewing the current New York Sectional Chart and U.S. Terminal procedures dated April 20, 2000. The Sectional Chart and U.S. Terminal Procedures is used to identify the published approaches and their visibility minimums for each runway. A visibility minimum is how close a plane on its approach can get to the airport without making visual identification.

As shown in the Terminal Procedures, there are multiple approaches available for arriving aircraft at GFL. The Instrument Landing System (ILS) approach to Runway 1 provides a minimum visibility of one mile and is supported by Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). Approach procedures to the airport and their associated visibility minimums are summarized in Table 2-9.

There are VOR approaches to Runway 19, all of which are available with distance measuring equipment (DME). VOR-DME is a non-precision instrument navigational aid. The visibility minimums start at one mile for approach category A and B (small aircraft) and increases to 1-1/2 to1-3/4 miles for class C and D (large aircraft) respectively.

In addition to the above-described straight in approaches to GFL, there is also a circle-to-land Global Positioning System (GPS) approaches for Runways 1 and 19. For the approach to Runway 1 for category A and B aircraft, the minimums are 1 mile of visibility. For category C and D aircraft the minimum visibility is 1-1/2 to 1-3/4 miles for each category, respectively. For the GPS approaches to Runway 19 the visibility minimums are the same as Runway 1. There are no published approach procedures for Runway 12-30, though they can be used with a circling approach

There is no active control tower on the airfield, however, local traffic advisories are provided via UNICOM Radio (Common Traffic Advisory Frequency-CTAF) on 123.0 Mhz.

TABLE 2-9
PUBLISHED APPROACHES

Runway End	Approach Type	Ceiling Minimum	Visibility Minimum	Approach Category
1	ILS	574 feet	1 mile	A, B, C, D
1	Straight-in Localizer	700 feet	1 mile	A, B, C, D
1	Circle-to-land	840 feet	1 mile	A, B
1	Circle-to-land	840 feet	1½ miles	C
1	Circle-to-land	900 feet	2 miles	D
1	LNAV MDA (GPS)	860 feet	1 mile	A, B, C
1	LNAV MDA (GPS)	860 feet	1 ¼ miles	D
1	Circle-to-land (GPS)	860 feet	1 mile	A, B
1	Circle-to-land (GPS)	860 feet	1 ½ miles	C
1	Circle-to-land (GPS)	900 feet	2 miles	D
12	LNAV MDA (GPS)	1,560 feet	1 ¼ miles	A
12	LNAV MDA (GPS)	1,560 feet	1 ½ miles	B
12	LNAV MDA (GPS)	1,560 feet	3 miles	D
12	Circle-to-land (GPS)	1,560 feet	1 ¼ miles	A
12	Circle-to-land (GPS)	1,560 feet	1 ½ miles	B
12	Circle-to-land (GPS)	1,560 feet	3 miles	C, D
19	LNAV MDA (GPS)	860 feet	1 mile	A, B
19	LNAV MDA (GPS)	860 feet	1 ½ miles	C
19	LNAV MDA (GPS)	860 feet	1 ¾ miles	D
19	Circle-to-land (GPS)	860 feet	1 mile	A, B
19	Circle-to-land (GPS)	860 feet	1½ miles	C
19	Circle-to-land (GPS)	900 feet	2 miles	D
30	LNAV MDA (GPS)	1,020 feet	1 mile	A, B
30	LNAV MDA (GPS)	1,020 feet	2 miles	C
30	LNAV MDA (GPS)	1,020 feet	2 ¼ miles	D
30	Circle-to-land (GPS)	1,020 feet	1 mile	A, B
30	Circle-to-land (GPS)	1,020 feet	2 miles	C
30	Circle-to-land (GPS)	1,020 feet	2 ¼ miles	D

Source: U.S. Terminal Procedures March 17, 2005 to May 12, 2005

2.14 Runways

Floyd Bennett Memorial Airport is equipped with a two-runway system, with runways designated 1-19 and 12-30. This runway system and its physical characteristics are shown in Table 2-10.

TABLE 2-10
RUNWAY SYSTEM CHARACTERISTICS

Characteristics	Runway 1-19	Runway 12-30
Category	Transport	Transport
Use	Primary	Secondary
Design Group	C-III	B-II
Length	5,000'	4,000'
Width	150'	100'
Strength (1,000's lbs.)	SW 80 DW 110 DTW 180	SW 39 DW 53 DTW 76
Composition	Asphalt-grooved	Asphalt
Condition	Excellent	Good
Wind Coverage (15 mph)	91.5%	89.9%
Gradient	0.1%	0.15%
Safety area condition	1 sub-standard /19 standard	Sub-standard (both ends)
Marking	Precision Instrument (1) Non-Precision Instrument (19)	Visual (both)
Lighting	HIRL-MALSR	MIRL

Legend: SW-single wheel
DW-double wheel
DTW-double tandem wheel
HIRL-high intensity runway lighting
MIRL-medium intensity runway lighting
MALSR-medium intensity approach lighting system with runway alignment indicator lights

Source: FAA Form 5010 (2/24/00), ALP (1991) and C&S Engineers, Inc.

2.15 Taxiways

The taxiway system at the airport consists of five taxiways, all in generally satisfactory condition:

TABLE 2-11
TAXIWAYS

Taxiway	Condition	Lighting	Dimension	Description
Taxiway A	Fair	MITL	2,200'x50'	Taxiway A extends from Runway 19 into the terminal area where it becomes the taxi-lane for the terminal area.
Taxiway B	Good	MITL	700'x50'	Taxiway B connects the terminal area with the midsection of runway 1-19.
Taxiway C	Excellent	MITL	750'x50'	Taxiway C stems off the terminal area and connects to runway 1-19. It makes this connection where runway 12-30 intersects runway 1-19.
Taxiway D	Fair	MITL	900'x40'	Taxiway D stems off the terminal area to connect with runway end 30.
Taxiway E	Fair	MITL	1,050'x40'	Taxiway E connects runway end 30 with runway end 1.

Source: C&S Engineers, Inc.

2.16 Navigation Aids

A navigation aid (NAVAID) can be described as "any facility used for guiding or controlling flight in the air or during the landing or takeoff of aircraft." This category includes landing instrumentation, runway marking, lighting and other visual aids. Floyd Bennett Memorial Airport currently is equipped with the following marking, lighting, and navigation aids, found in Table 2-12.

TABLE 2-12
NAVIGATIONAL AIDS

Item	Location
High Intensity Runway Lighting (HIRL)	Runway 1-19
Medium Intensity Runway Lighting (MIRL)	Runway 12-30
Precision Instrument Runway Marking	Runway 1-19
Standard Marking	Runway 12
Standard Marking	Runway 30
Medium Intensity Approach Light System with Runway Alignment Indicator Lights (MALSR)	Runway 1
Instrument Landing System (ILS)	Runway 1
Medium Intensity Taxiway Lighting (MITL)	All Taxiways
Terminal VHF Omnidirectional Range (TVOR)	Midfield
Rotating Beacon	Top of the Terminal Building
Direction Finder	Northeast of Terminal Building
Hazard Beacon	Top of the Queensbury Water Tower
Obstruction Lights (4)	Chestnut Ridge Road
Visual Approach Slope Indicator (VASI)	4 box on Runway 1 and 19

Source: FAA Form 5010 (02/24/00) and C&S Engineers, Inc.

2.17 Airport Operational Concerns

The Floyd Bennett Memorial airport representatives, working together with the advisory committee and the consultant have identified some initial operational concerns at the airport. These include the following:

- Floyd Bennett Memorial Airport located at the foothills of the Adirondack Mountains, is a gateway to tourism, but has no commercial service.
- The north terminal apron and Taxiway A need to be rehabilitated (currently under construction).
- There is no taxiway access to Runway end 12.
- The precision instrument approach on Runway 1 and the non-precision instrument approach on Runway 19 could be improved to provide increased landing capability and improve safety.
- The FBO needs a new hangar for its maintenance operations to allow expansion of its business.
- Landside maintenance facilities are inadequate and are in need of repair.
- Conventional as well as T-Hangar space is inadequate.
- The airport needs a plan for how to become a catalyst for economic growth and development in the area.

2.18 Landside Facilities

The availability, location, and condition of existing facilities on the property will influence a development plan for the airport. Thus, an inventory of buildings at Floyd Bennett Memorial Airport was developed. The inventory considered a number of factors, including building condition, size, use, and composition. The buildings inventoried include administrative, maintenance and access facilities. These facilities and their associated conditions are listed in Table 2-3 and shown on Figure 2-2.

TABLE 2-13
LANDSIDE FACILITIES CHARACTERISTICS

Bldg. #	Facility	Size(app.)	Condition	Composition	Use
4	Terminal/ Administration	2,424sf	Good	Masonry	Terminal Building
7	Former FBO Office	800sf	Fair	Metal	FBO office
12	County Garage	1,950sf	Fair	Metal	Storage
13	County Garage	2,250sf	Fair	Masonry	Storage
15	Airport Entrance Road	24 x 640’	Good	Asphalt	
16	Auto Parking Lot	4,000 SY	Fair	Asphalt	
17	Storage	1,800sf	Poor	Metal	Sand Storage
18	Pump House	500sf	Fair	Metal	Septic Utilities
Airside 8	Main Hangar	13,750sf	Fair	Metal	Aircraft Storage
9	T-Hangar (2-6 bay)	6,125sf	Poor	Metal	Aircraft Storage
10	T-Hangar (1-6 bay)	7,500sf	Excellent	Metal	Aircraft Storage
11	Aircraft maintenance hangar	2,750sf	Poor	Masonry	Maintenance
14	Fuel Farm 1 (Avgas 100LL)	N/A	Excellent	Above Ground	Aircraft Fueling
14	Fuel Farm 2 (Jet-A)	N/A	Excellent	Above Ground	Aircraft Fueling

Source: C&S Engineers, Inc.

2.18-1 Terminal Building

The terminal building was originally constructed in 1946. The terminal building has just completed a major refurbishment in 1999. Improvements included structural reinforcement, improved layout, use of space and cosmetic enhancements (see Photo 5).

Photo – 5 Terminal Building

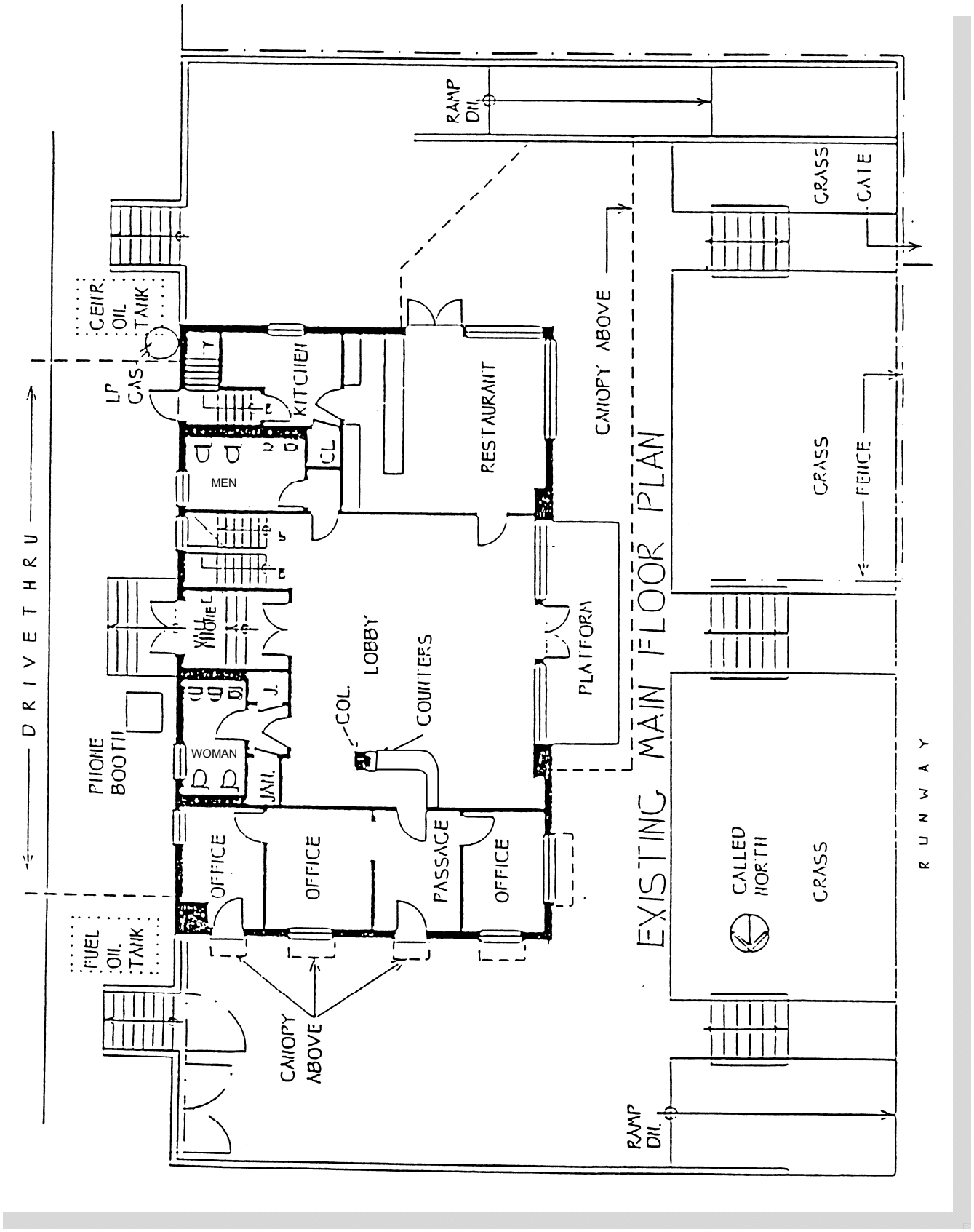
The terminal building is a two-story, 2,424 square-foot rectangular shaped structure with a full basement and 3-level observation tower on the flat roof. The east-side of the building has a single-lane, covered drive through entrance and the airfield entrance to the west has an eight-foot deep canopy which extends to the south side of the building creating a covered outdoor area (See Figure 2-5a).

The present use of the main floor is primarily the ±445 square feet of office and counter space used by Empire East Aviation, the Fixed Base Operator and the 500 square feet of restaurant and kitchen area used by local pilots and airport employees. There is a lobby area in the center of the terminal complete with telephones, restrooms, a view of the airfield and seating (see Photo 6).

Photo 6 - Lobby

Airport operations occupy the second floor. There is office and conference space/pilots lounge (325 square feet each) for the airport administration on the south side and FAA office and maintenance use (150 and 350 square feet respectively) on the north side of the terminal. In between these spaces on the west side facing the airfield is a weather observation office (500 square feet) and on the east side there are restroom facilities, storage space (70 square feet each) and the stairwell. A metal spiral staircase leads up to the unoccupied observation tower and provides access to the roof (Figure 2-5b).

The airport employs 14 full-time and 10 part-time employees. There are 7 full-time Warren County employees, 5 full-time and up to 10 part-time employees for Empire East, and a full-time FAA employee including facilities maintenance and a weather observation officer. Weather observation was provided 24-hrs per day, but has been discontinued since 2002.

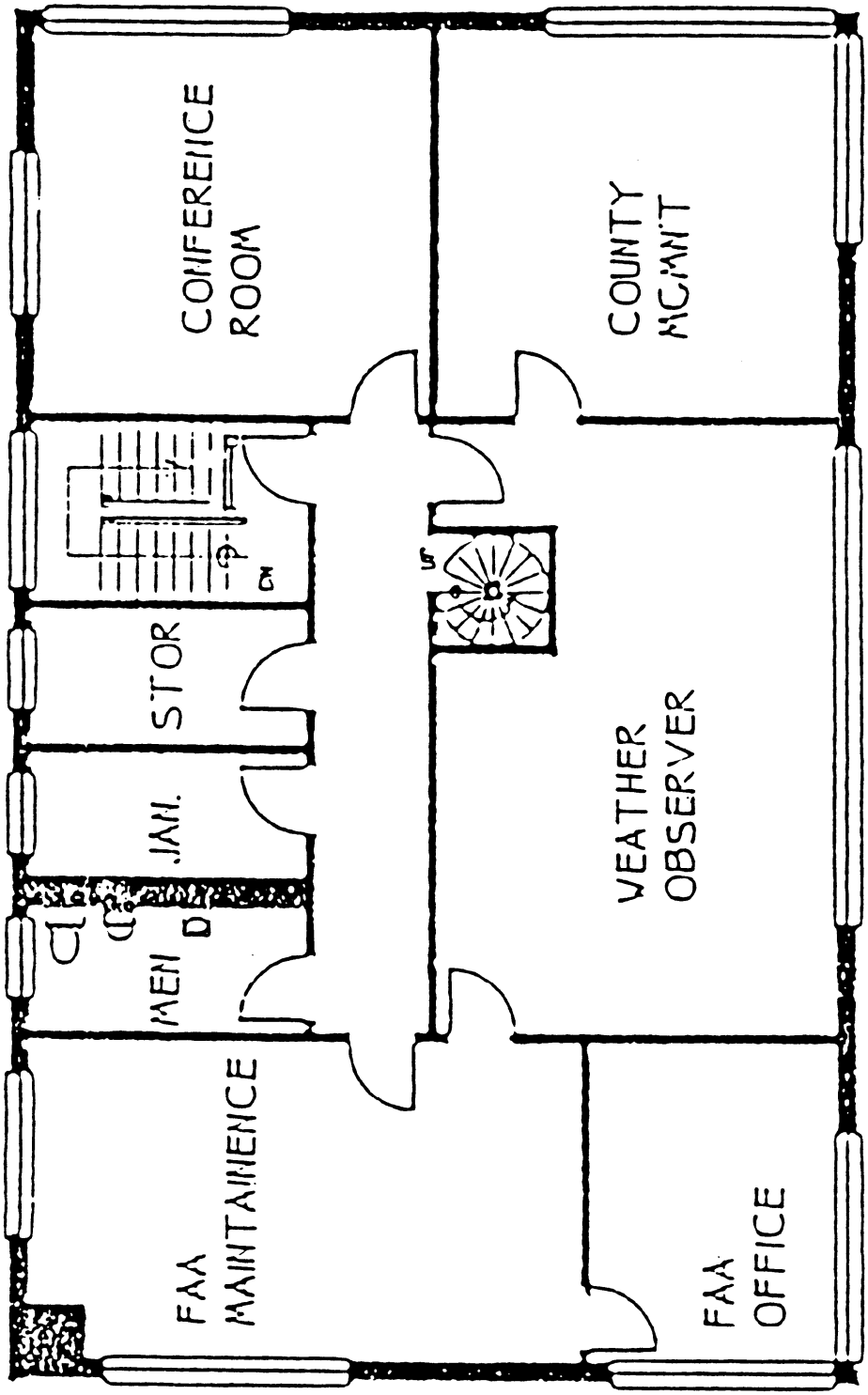


Floyd Bennett Memorial Airport

Terminal Plan

Main Floor

Figure 2-5a



Floyd Bennett Memorial Airport

Terminal Plan

Second Floor

Figure 2-5b

2.18-2 ARFF Building and Fire-Fighting Equipment

The ARFF building is constructed of masonry block and in excellent condition. The building was constructed in 1997. The ARFF building was designed with a lobby, training room, fully equipped restroom facilities, storage and a two-bay garage for the fire-fighting trucks (see Photo 7).

Photo 7 – ARFF Building

The requirements for Airport Rescue and Fire Fighting (ARFF) services at an airport are established under Federal Aviation Regulations (FAR) Part 139-Certification and Operations: Land Airports Serving Certain Air Carriers. FAR Part 139.315 establishes a system of indexing airports for a level of fire protection. The overall length of the aircraft having five or more daily departures determines the airport's ARFF index.

Photo 8 – ARFF Truck

The airport currently operates as an Index A facility. Index A includes aircraft less than 90 feet long. An Index A classification means that the airport must have either one truck that can carry 500 pounds of a sodium-based dry chemical or Halon 1211 or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF foam application.

The airport currently has the following ARFF equipment (see Photos 8 and 9):

- 1990 Chevrolet ½ Ton Truck – In fair condition; truck does not meet FAA Index A requirements and needs to be replaced.
- 1992 Ford Truck – In good condition, meets FAA Index A requirements.

Photo 9 – ARFF Equipment

One of the two ARFF vehicles at the airport currently meets FAR Part 139 certification requirements according to airport personnel. Emergency supplies as well as firemen's clothing are also contained within the vehicle bays. The building is kept clean and neat considering the necessary supplies that are stored within the building (see Photo 9). Circulation around the vehicles is excellent within the bays of the ARFF building and throughout the entire ARFF building.

2.18-3 Maintenance and Support Buildings

Adjacent to the ARFF building is the electrical building. The electrical building houses a generator, distribution and regulation room for electrical distribution throughout the airport. The building was built in 1996 and is in excellent condition (see Photo 10).

Photo 10 – Electrical Building

The remainder of the buildings on the airport property are county-owned garages, maintenance and storage buildings. The two county garages house trucks, earth moving equipment and snow removal equipment. The garages contain small work areas to service the equipment and are very confined. The garages themselves are in fair condition. The larger of the two garages is constructed of masonry. It has a three-bay garage door opening and a flat roof. The building's condition is fair yet it is beginning to show its deterioration.

Photo 11 – County Garage

The smaller garage is a two-bay garage, metal framed with a corrugated metal skin (see Photo 11). This garage is long and narrow and is very congested with vehicles and other equipment. There is no heat and inadequate ventilation in this building (see Photo 12).

The remainder of the support buildings include a sand storage building, aircraft maintenance hangar, equipment storage building, and buildings that house equipment associated with the leach field are all in poor condition. In addition to refurbishing some of these buildings, new facilities are needed as there are trucks and various implements parked and stored outside (see Photo 13).

Photo 12 – Interior of County

The former FBO office building is located south of the terminal building. This small (20 x 60 feet) building is a metal framed and skinned building that used to house Empire East Aviation operations before they relocated to the terminal building.

Table 2-14 lists the major pieces of maintenance equipment for the airport.

Photo 13 – Airport Equipment

TABLE 2-14
MAINTENANCE EQUIPMENT

Type	Make	Year	Condition	Comments
Tractor/Mower	John Deere 750	1986	Good	Needs tires and clutch
Tractor/Mower	Ford 4630	1992	Good	
Tractor/Mower	Ford 7710	1990	Good	Needs some maintenance
Tractor/Mower	Ford 7710	1990	Good	Needs some maintenance
Tractor/Mower	Case	1995	Good	Not suited for mowing rough fields
Snowplow	International Single Axle Dump	1990	Fair	Near end of useful life
Snowblower	Sicard	1974	Poor	Needs to be replaced
Snowblower	Oshkosh	1980	Good	Does not blow snow effectively and provides poor visibility for driver
Fire Truck	Chevrolet ½ Ton	1990	Fair	Not used to meet FAA fire requirements. Needs replacement. Not eligible for FAA funds.
Fire Truck	Ford	1992	Good	Meets Index A requirements
Utility Dump	Ford 1 Ton	1996	Good	
Pickup	Chevrolet ¾ Ton	1998	Good	(Assistant) Airport Manager's vehicle
Loader	John Deere 544	1990	Good	
Broom	Military Tug	1975	Poor	Broom too small and unreliable. New broom capable of snow and FOD removal is a high priority.

Source: Assistant Airport Manager

The airport equipment is supplemented with a second single-axle dump truck with a snow plow in the winter, but usage of this plow depends on the county's schedule for using it. Airport management indicates that a truck with an underbody blade and the capability of liquid de-icing application would be useful.

Both of the airport's plows are one-way front plows with single wings mounted on the right side. There is a 16-foot ramp hog for the loader, which is used to clear the ramps and taxilanes. Eight-foot and ten-foot Meyer snow plows are also available for the 1-ton and the manager's truck if additional capability is needed. These are used primarily for touch-up work.

2.18-4 Utilities

The airport is currently supplied water from the Queensbury municipal water system. The passenger terminal complex is served by a sanitary sewer line, which is connected to an on-site sewer facility. Niagara Mohawk supplies electric power to the airport via above-ground power lines. There is a transformer located adjacent to the county mechanics garage. The aircraft maintenance hangar and 3-bay county garage are heated with bottled propane. The terminal building is also heated with propane and has a back-up energy source using diesel fuel. A sewer line coming from Queensbury Avenue is planned to be installed and will service all the buildings in the terminal area (terminal, shops, old FBO building). The sewer line may service future development at the airport.

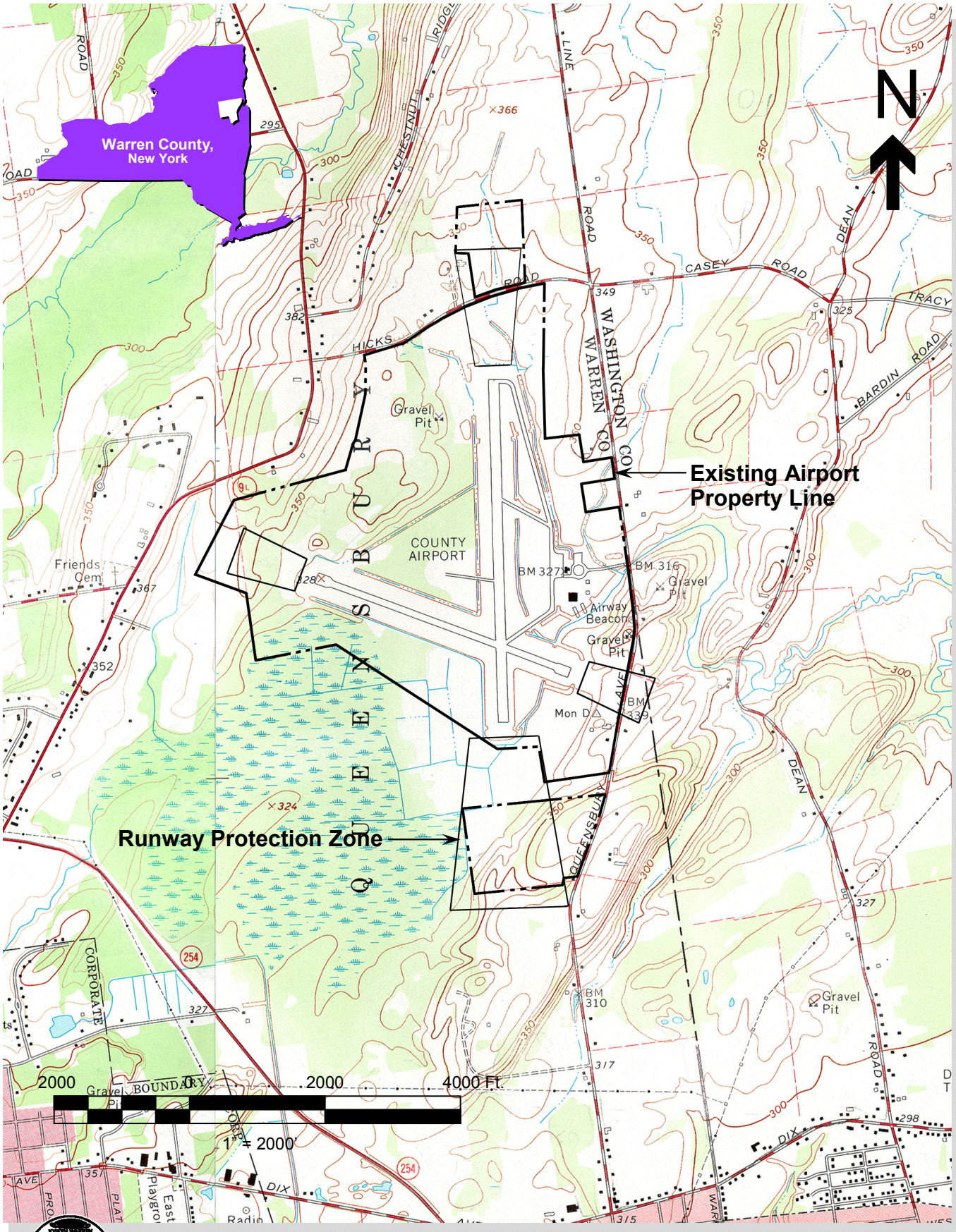
2.18-5 Ground Access

Interstate 87, the Adirondack Northway, serves Warren and Washington Counties and extends from the New York State Thruway (I-90) at Albany, north to the Canadian border. Access to the airport from Interstate 87 is off Exit 19, heading easterly on Route 254 to Queensbury Avenue, approximately 4 miles. The airport entrance is on the left, approximately 1 mile north on Queensbury Avenue (See Figure 2-6). The airport is located about 3 miles northeast of Glens Falls. Queensbury Avenue is scheduled for a road rehabilitation project in 2002.

2.18-6 Access and Automobile Parking

The airport has one entrance from Queensbury Avenue into the airport. Queensbury Avenue is an arterial roadway that runs north along the Warren and Washington County border and south into Hudson Falls. To gain access to the airport from the public highway, travelers enter onto a 640-foot long access road that terminates at the terminal building. The airport access road is in good condition. There is access to a parking lot for general aviation off of this access road. Once at the terminal building, visitors can choose between day parking and long-term parking options. There are 44 day time parking spaces and 66 long-term parking spaces.

The airport roadway system provides for one-way loop circulation in front of the terminal building. One through lane and one parking lane are available within the curb-to-curb width. The inside lane is reserved for curbside parking; the outer lane is for through traffic. The circulation loop around the terminal area is in poor condition. There is some aerial lighting on the circulation loop and vehicle parking, although it appears inadequate.



Floyd Bennett Memorial Airport

Access Map

Figure 2-6

Chapter 3 - General Aviation Forecast

3.01 Aviation Demand Forecasts

Forecasts of aviation demand are a key element in any airport planning project. Demand forecasts, based upon the desires and needs of the service area, provide a basis for determining the type, size and timing of aviation facility development and a platform upon which this master planning study will be based. Consequently, these forecasts influence all phases of the planning process.

The aviation demand forecasts will serve four purposes in the development of the master plan. Specifically, they provide for:

- Determining the necessary capacity of the airfield, apron, and ground access system serving the airport,
- Determining the airport's role and resulting size and type of facility development,
- Evaluating the potential environmental effects, such as noise, due to the airport's development and operation, and
- Evaluating the financial feasibility of alternative airport development proposals.

Forecast data presented in this study is provided by the Federal Aviation Administration Terminal Area Forecasts (FAATAF), New York State Aviation Activity Forecast Study (NYSAAFS) and New York State Aviation System Plan (SASP). The master plan for Floyd Bennett Memorial Airport (formerly Warren County Airport) was completed in 1991 by Rist-Frost Associates and is also used as a source of data. In addition, information from Empire East Aviation, the airport's Fixed Base Operator was used to develop forecasts. The information in these documents will serve as a comparative basis of forecasting aviation demand at the airport to the year 2020. Specific portions of these statewide and federal planning studies will be referenced, compared, and adjusted to more accurately reflect the present and expected future conditions at the airport.

3.02 General Aviation Activity

Forecasts of general aviation demand require the evaluation of the following variables:

- Based Aircraft
- Fleet Mix
- Operations
- Peak Period Activity

The term "general aviation" (GA) refers to all flying except the military and commercial airlines. Typically, the measures of based aircraft and annual operations are used to gauge general aviation aeronautical activity. In addition, there are a number of other activity

indicators that must be forecast in order to generate necessary facility requirements for Floyd Bennett Memorial Airport. A facility requirements analysis will be presented later in the study. The following sections detail the methodology and results of the general aviation activity forecasting effort.

3.03 Based Aircraft

A based aircraft is an aircraft that is stationed at an airport as its "home base." Forecasts of based aircraft have been presented in the FAA TAF, the SASP, the NYSAAFS and the 1991 Master Plan, and shall be compared, updated, and applied to the present and expected future conditions at the airport (i.e. the preferred forecast). Historical and forecasted figures for based aircraft from these various sources are shown in Table 3-1.

The existing number of based aircraft at the airport was obtained by dialogue with the Fixed Base Operator, Empire East Aviation, Inc. To develop the preferred forecast of based aircraft, the following data were analyzed: the based aircraft forecast in the 1991 Master Plan, other state and federal aviation forecasts, socioeconomic indicators, and growth of the area.

The FAATAF was not used for comparison since it is flat throughout the forecast period. The New York State Aviation System Plan (SASP) is a conservative forecast with a growth of only 3 based aircraft through the forecast period. The New York State Aviation Activity Forecasts Study (NYSAAFS) shows more aggressive growth with a gain of 9 based aircraft. The 1991 Master Plan forecasted the strongest growth with a gain of 20 based aircraft.

The preferred based aircraft forecasts, developed by the consultant for this Master Plan, are presented in Table 3-1 for comparison purposes. The development of the preferred forecasts are discussed in this, and following sections.

TABLE 3-1
BASED AIRCRAFT HISTORY AND FORECAST

Year	Existing[1]	FAA TAF[2]	SASP[3]	NYSAAFS[4]	1991 Master Plan[5]	Preferred[6]
Historical						
1980		50				
1985		43				
1989		69		69		
1990		59				
1995		73	71			
1999						
2000	61					
Forecast						
2005		53	72	83*	87*	69
2010		53	73	86	97	74
2020		53*	75*	92*	107*	85

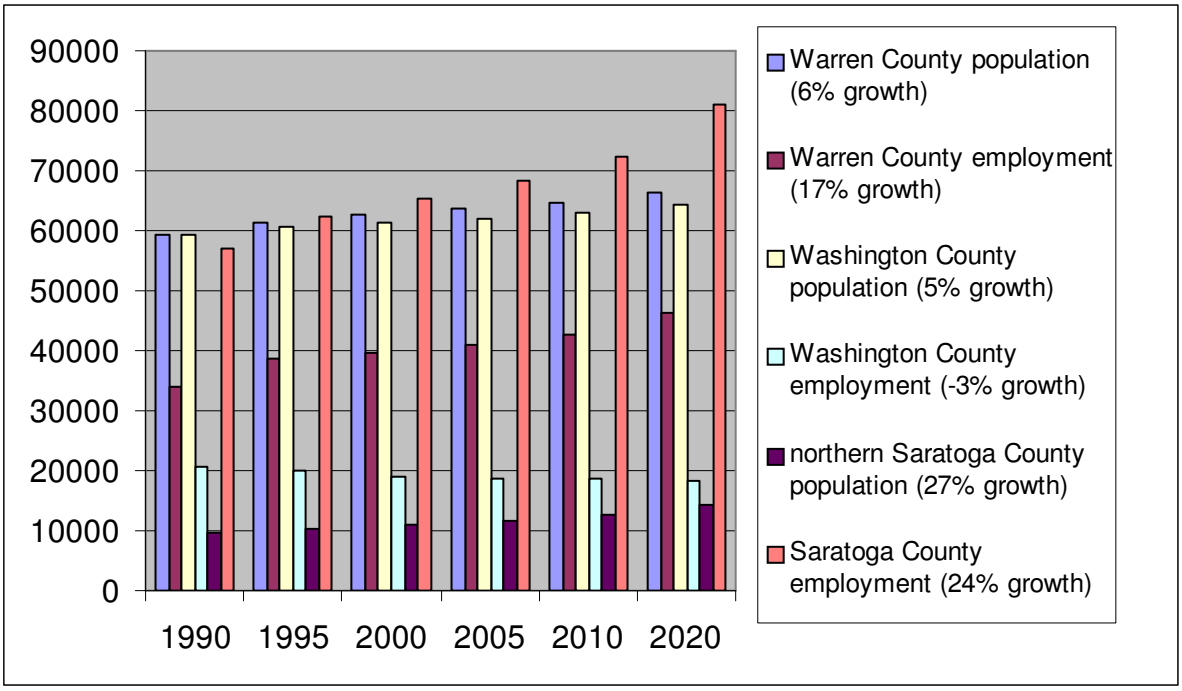
1 Floyd Bennett Memorial Airport
2 Federal Aviation Administration, Terminal Area Forecasts (1980-2015)
3 New York State Aviation System Plan (1998)
4 Source: New York State Aviation Activity Forecasts Study (1992)
5 Master Plan (1991)
6-Source: C&S preferred forecasts.
* Interpolated and extrapolated for forecast years.

Source: C&S Engineers, Inc.

The growth rates of socioeconomic indicators support the growth rate for the based aircraft forecast. One effect of an economy that is growing is the increased affordability of owning and operating aircraft. This translates into increased business and personal use of aircraft. This is the case in the Floyd Bennett Memorial service area as localized economic conditions and interest in renting hangar space at the airport is growing. Socioeconomic data is a combination of economic factors and population growth. The growth rates of socioeconomic data are analyzed in three categories:

1) A forecast of population in Warren, Washington and northern Saratoga county (Town of Moreau),
2) A forecast of employment by industry for Warren, Washington and Saratoga counties, and
3) A history (1993-1998) of county business patterns in Warren, Washington and Saratoga counties.

CHART 3-1
SOCIOECONOMIC GROWTH RATES



Source: NYSDOT, Special Forecasts prepared by the WEFA Group 9/99

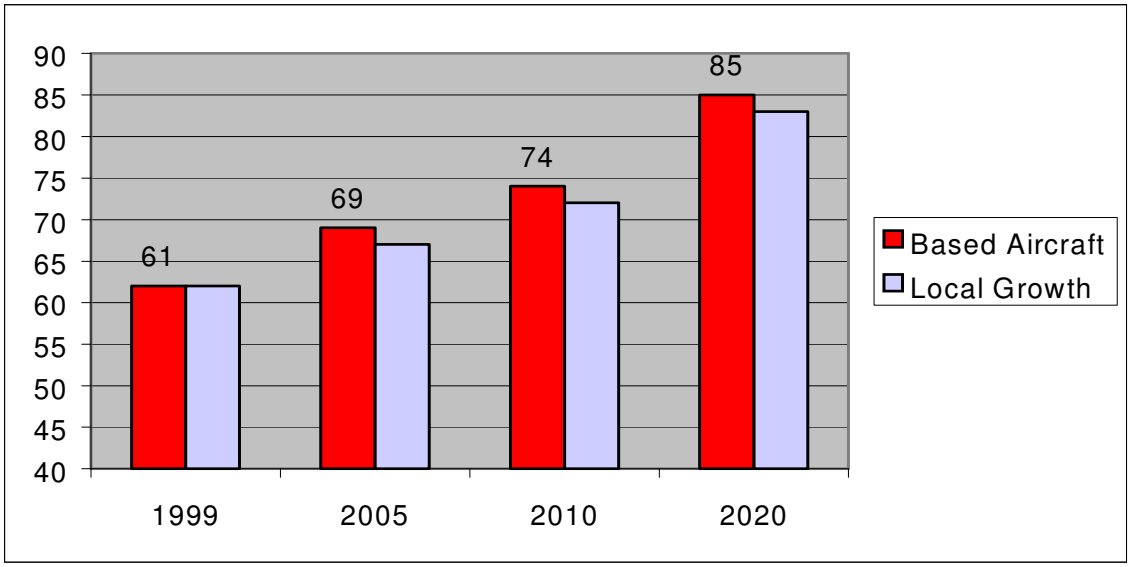
The data displayed in Chart 3-1 shows a 10-year history of growth and forecasts steady growth throughout the twenty-year planning period. The socioeconomic indicators in Washington County are stagnant and are an exception to the growth found in the remainder of the study area. This socioeconomic data was collected from the U.S. Census Bureau: County Business Patterns, Wharton Econometric Forecasting Association Group (WEFA) and the Capital District Regional Planning Commission (CDRPC).

According to the FAA TAF Report, the number of based aircraft at Floyd Bennett Memorial Airport has grown steadily, then leveled off at 61 aircraft. However, according to communication with airport officials, there has been a recent surge in requests for hangar space for based aircraft. This increase may be attributed to the growth of Warren County as well as airport-specific changes in the marketplace for hangar space.

For example, the Fortune Air hangar at Schenectady County Airport has recently been sold and will no longer lease space. Thus, the number of GA aircraft owners looking for hangar space has increased. The waiting list for hangar space at Floyd Bennett has 14 aircraft on it, 3 of which are not currently based at the airport. The current count of based aircraft is constrained by the lack of available hangar space at the airport. Local interest in Floyd Bennett Memorial Airport is further supported by the pilot surveys.

Based on comments received on the pilot survey, pilots are attracted to Floyd Bennett Memorial Airport because of its location, condition, a well-run FBO and competitive prices. Chart 3-2 displays the preferred forecast of based aircraft along with the growth rate of socioeconomic factors (population, employment and county business patterns), adjusted to reflect local economic conditions and increased interest in hangar space.

CHART 3-2
BASED AIRCRAFT FORECAST AND LOCAL GROWTH



Source: C&S Engineers, Inc.

3.04 Based Aircraft Fleet Mix

The forecast of the based aircraft fleet mix (type of aircraft) is based upon expected national trends adjusted to local conditions. These forecasts give an indication of the growth and direction of the fleet, and of potential future based aircraft at Floyd Bennett Memorial Airport. Table 3-2 presents the forecast fleet mix percentages for each of the forecast components, while Table 3-3 presents the based aircraft fleet mix resulting from these percentages. The current fleet mix is predominately single-engine piston, with three multi-engine piston aircraft among the 61 based aircraft at the airport. Although national trends indicate that single-engine GA aircraft will continue to dominate the fleet mix, the higher performance aircraft will show the highest rate of growth. This national trend is demonstrated by FAA Aviation Forecast, Fiscal Year 2000-2001. The based fleet is heavily weighted towards the smaller aircraft within the GA fleet, but the higher growth rates of turbo props and jets will be reflected in the forecast, consistent with national trends.

TABLE 3-2
BASED AIRCRAFT FLEET MIX PERCENTAGE FORECAST

Year/Source	Piston		Turbine				
	Single Engine	Multi Engine	Turbo Prop	Turbo Jet/Fan	Rotor	Other	Experimental
1999 (Existing)	93.5%	4.9%	0%	1.6%	0%	0%	0%
2005							
FAA[1]	69.5%	8.5%	3.1%	4.1%	3.8%	2.7%	8.3%
NYRASP[2]	89%	11%	0%	0%	0%	0%	0%
C&S[3]	89%	6%	1%	3%	1%	0%	0%
2010							
FAA	68.6%	8.1%	3.2%	4.8%	3.9%	2.8%	8.6%
NYRASP	88%	12%	0%	0%	0%	0%	0%
C&S	84%	8%	3%	4%	1%	0%	0%
2020							
FAA	66.7%	8.0%	3.4%	6.3%	4.0%	2.8%	8.8%
NYRASP	86%	13%	0%	1%	0%	0%	0%
C&S	77%	11%	5%	6%	1%	0%	0%

1 (2000) FAA Aerospace Forecasts Fiscal Years 2000-2011
2 (1994) New York Regional Aviation System Plan (NYRASP)
3 C&S preferred estimate for Floyd Bennett Memorial Airport

Source: C&S Engineers, Inc.

The fleet mix forecast, presented in Table 3-3, was derived from a comparison of the FAA Aerospace Forecasts, NYRASP and the existing fleet mix. The current operating fleet mix at Floyd Bennett Memorial consists of 94% single engine aircraft, 5% multi-engine aircraft and 1% jet aircraft. The comparison of existing and forecasted fleets indicates that the majority of aircraft operated in the region are single engine aircraft, and would therefore continue to dominate the fleet mix, although a trend has developed for growth of higher performance aircraft such as jet and turboprop aircraft. This national trend is demonstrated by FAA Aviation Forecast, Fiscal Year 2000-2001.

TABLE 3-3
BASED AIRCRAFT FLEET MIX FORECAST

Aircraft Type	1999 (Existing)	2005	2010	2020
Single Engine	57	61	62	66
Multi Engine	3	4	6	9
Jet	1	2	3	5
Turboprop	---	1	2	4
Rotor	---	1	1	1
TOTAL	**61**	**69**	**74**	**85**

Source: FAA Aviation Forecast, Fiscal Year 2000-2001
C&S Engineers, Inc.

3.05 Basis for Operations Forecast

Fuel Consumption

An aircraft operation is a measure of activity that is defined as either a takeoff or a landing. A takeoff and a landing by one aircraft equal two operations. Since the airport does not have a control tower and is not manned 24 hours per day to provide an accurate method of tracking numbers of aircraft operations, an alternative method for establishing a baseline for an operations forecast was used. The annual fuel sales at the airport provided an estimate of the number of current and future operations. Fuel sale information was provided by Empire East Aviation, Inc., the only Fixed Base Operator at the airport. Empire East Aviation, Inc. is open 7am to 7pm, seven days per week. Empire East Aviation also provides 24-hour fuel service on a call-in basis.

The FBO reports that approximately 67,275 gallons for 100LL and 84,000 gallons of JetA fuel were sold in 1999. The average fuel sale for 100LL was 25 gallons, and the average sale for JetA fuel was 250 gallons.

Therefore approximately 2,691 aircraft (67,275/25=2,691) purchased 100LL fuel in 1999. Similarly, for JetA fuel sold in 1999, approximately 336 aircraft bought fuel (84,000/250=336).

According to the FBO, for every aircraft operator that purchases 100LL, there are three aircraft operators that do not purchase fuel. It is assumed each of the aircraft operators buying 100LL fuel performs at least two operations and that 6 operations occur from planes that do not buy 100LL fuel.

The ratio for JetA fuel sales is for every aircraft operator that purchases JetA, there are two aircraft operators that do not purchase fuel. It is assumed each of the aircraft operators buying JetA fuel perform at least two operations and that an average of 4 operations occur by aircraft not buying fuel. Airport management concurs with the above estimates.

Flight School Operations

Touch and go operations mean aircraft approach, briefly touch down, and then depart the runway without stopping or exiting the runway, and are usually associated with flight school training. In addition practice instrument approaches and low approaches occur regularly at the airport. The primary source of these operations are flight schools in the area. Empire East, which is the flight school based at the airport, estimates 20 hours of flight training time per week with each hour of flight training resulting in 4 touch and go operations, or approximately 80 touch and go operations occur per week. Flight schools from Schenectady County, Saratoga County, and Argyle utilize Floyd Bennett Memorial regularly, as well as *Air Now* an air cargo division of *Business Air,* which uses the airport to train its pilots. Refer to Table 3-4 for a summary of operations from the flight schools at the airport.

TABLE 3-4
SUMMARY OF OPERATIONS FROM FLIGHT SCHOOLS

Source of Operations	Operations per week (approximately)
Empire East Flight School	80
Flight School from Saratoga County	42
Flight Schools from Schenectady County	12
Flight School from Argyle	64
Air Now	60
TOTAL	**258**

Source: C&S Engineers, Inc.

The use of fuel and flight school data to estimate operations for 1999 result in the following estimate of total operations.

- 100LL fuel purchases 2,691(2+6)=21,528 operations
- JetA fuel purchases 336(2+4)=2,016 operations
- Operations from flight schools 258(52)=13,416 operations

Total estimate of operations is 37,000 in 1999.

OTHER FORECASTS

There are several sources of information considered in developing the growth rates for general aviation operations. The FAA Aerospace Forecasts for Fiscal Years 2000-2011 provides national GA trends and forecasts. This document states that there has been a turnaround in the general aviation industry and activity due to the economic expansion during the 1990's. According to the report, an approximate growth rate of 2% per year of general aviation activity can be expected. Since 9/11 there has been an increase in the fractional ownership general aviation fleet. The FAA Aerospace Forecasts for Fiscal Years 2005-2016 forecasts that the number of turbo-jet aircraft will nearly double from 1999 to 2016, while the single-engine fleet will actually shrink in the same period. Appendix G, Supplemental Runway Length Analysis, provides additional information to support increased turbo jet use at Floyd Bennett Memorial Airport.

The 1994 Northern New York Regional Aviation System Plan (RASP) was referenced in order to find a growth rate consistent with the region. This plan studied a nine county region in northern New York, including Warren and Washington counties. General aviation operations were forecasted to grow at an annual rate of approximately 1.6% at Floyd Bennett Memorial Airport. However, due to the past six years of growth in GA activity, this number has been judged to be too conservative.

The general aviation operations forecast is also supported by the socioeconomic data presented earlier in the discussion of based aircraft. The tourism industry is providing economic and population growth that is greater than other regions in New York. Employment in the study area is forecast to increase at approximately 12% over the 20-year planning period, and Saratoga County is ranked second in New York State in

population growth. Warren County is also in the top third of fastest growing population for New York State counties.

A steady growth of the local economy and population points towards increased operations. The FAA Forecasts for 2000-2011 state that the highest growth rates in GA activity will be in the high performance turbo-prop and turbo-jet aircraft used for business and the growing tourism industry can be expected to boost operations at the airport. The Floyd Bennett Memorial Airport provides easy access to many popular tourist destinations. Another example of the correlation between the socioeconomic data and increase of operations at the airport is a trend toward more participation by the general population in the usage of general aviation aircraft for personal use.

Considering national and regional forecasts of general aviation activity, as well as economic growth rates for the area, operations at the airport can be anticipated to grow at a rate of 2.5% per year throughout the forecast period. This growth rate is a subjective estimate based on local economic conditions.

A 2.5% annual growth rate will yield more than a 50% increase in operations over the 20-year planning period. This forecast is consistent with the trends in the socioeconomic growth rates anticipated for population, employment, and tourism in the study area as reported by Adirondack/Glens Falls Transportation Council (A/GFTC).

Table 3-5 presents the C&S preferred forecast for annual general aviation operations based on this anticipated growth rate. The table compares GA operations forecasts from other sources that were considered in the analysis.

TABLE 3-5
GENERAL AVIATION OPERATIONS HISTORY AND FORECAST

Year	Floyd Bennett Memorial Airport	FAA Terminal Area Forecast	RASP	NYSAAFS	Master Plan (1991)	Preferred Forecast
Historical						
1989		12,531		23,885		
1990		13,362	24,850		35,000	
1995		10,110		27,300	38,500	
1999	37,000**	11,425				
Forecast						
2005		11,425	32,500*	30,310*	46,500*	**41,800**
2010		11,425	34,700	34,700	52,300	**47,300**
2020		11,425*	41,500*	37,894*	58,000*	**60,600**

∗Interpolated and extrapolated by the consultant.
**Estimate based on fuel sales and operations from flight schools.

Source: C&S Engineers, Inc.

OPERATIONS SPLIT (LOCAL AND ITINERANT)

According to the FAA Master Planning Advisory Circular, a local operation is defined as "arrivals and departures of aircraft which operate in the local traffic pattern and are known to be departing for or arriving from flights in local practice areas

within a 20-mile radius of the airport; plus simulated instrument approaches or low passes at the airport executed by any aircraft. Itinerant operations are all aircraft arrivals and departures other than the local operations described above."

A local/itinerant operational split of 44 percent local and 56 percent itinerant was obtained from the FAA Airport Master Record Form 5010 (4/20/2000). Table 3-6 shows the breakdown of local and itinerant operations at the airport. The local/itinerant operations split appears to be realistic for the forecast period.

TABLE 3-6
ANNUAL GENERAL AVIATION OPERATIONS SPLIT (Local and Itinerant)

Year	Local Operations	Itinerant Operations	Total
Historical			
1999	16,300	20,700	37,000
Forecast			
2005	18,392	23,408	41,800
2010	20,812	26,488	47,300
2020	26,664	33,936	60,600

Source: C&S Engineers, Inc.

3.06 Peak Period Activity Forecasts

Since many of the airport's facility needs are related to the levels of activity during peak periods, forecasts were developed for peak month and peak hour operations.

In order to establish a reasonable estimate of the peak demand periods at the airport we again examined fuel sales records of the FBO at the airport. Monthly fuel sales allow us to gauge when the peak activities occur at the airport and how the peaks compare to the rest of the year.

When comparing monthly fuel sales for the past three years, with few exceptions, the months of July and August are historically, and understandably, the peak months. The sales of both Jet A and Low Lead fuels are consistently more than double the average for the rest of the year. Therefore, it is reasonable to conclude that the aircraft activity in the peak summer months is approximately double that of the rest of the year.

The peak period general aviation operations for 1999 at Floyd Bennett Memorial Airport were calculated using the following methodology:

Peak Month Operations: This level of activity is defined as the calendar month when peak aircraft operations occur. Peak month percentages at Floyd Bennett Memorial Airport are typically 100 percent busier than an average month of the year, due to greater seasonal use of the airport.

Peak Month Operations = (Annual Operations/12) x 2.00

Design Day Operations: This level of operations is defined as the average day within the peak month.

Design Day Operations = Peak Month Operations/30

Design Hour Operations: This level of activity is defined as the peak hour within the design day. Typically these operations will range between 10 and 15 percent of the design day operations. The lower the annual number of operations, the higher the design hour percentage of the design day.

Considering the level of operations forecast annually for the 2-year forecast period, and after discussion with airport management, a figure of 10 percent was used to estimate design hour operations.

Design Hour Operations = Design Day Operations x 0.10

Table 3-7 presents the forecast of peaking characteristics for general aviation operations at Floyd Bennett Memorial Airport.

TABLE 3-7
GENERAL AVIATION OPERATIONAL PEAKING FORECAST

Year	Annual Operations	Peak Month Operations	Design Day Operations	Design Hour Operations
1999	37,000	6,166	205	21
2005	41,800	6,967	232	23
2010	47,300	7,883	263	26
2020	60,600	10,100	337	34

Source: C&S Engineers, Inc.

3.07 Military Operations Forecast

Based on the current FAA Airport Master Record (4/20/2000), the number of military operations totaled 500 in 1999. It is projected that military activities, primarily helicopter operations, will yield approximately the same number of annual operations for the forecast period.

3.08 Forecast of Annual Instrument Approaches

A necessary task in assessing the need for new or improved landing aids is a forecast of the levels of instrument approaches at the airport. An instrument approach can be defined as a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions (e.g., poor weather) from the beginning of the initial approach to a landing or to a point from which a landing may be made visually. Instrument Flight Rules (IFR) take effect when the ceiling is 1000 feet or less or the visibility is less than three miles. Weather data from the Northeast Regional Climate Center shows that 7.8% of the year visibility is less than three miles at the airport. This translates into approximately 2,886 instrument approaches per year. Table 3-8 includes forecasted Instrumental Approaches.

TABLE 3-8
FORECAST INSTRUMENT APPROACHES

Year	Total Operations	Approach Percentage	Approach Forecast
1999	37,000	7.8%	2,886
2005	41,800	7.8%	3,260
2010	47,300	7.8%	3,689
2020	60,600	7.8%	4,727

Source: C&S Engineers, Inc.

3.09 Forecast Summary

The major demand forecast elements of the study are summarized in Table 3-9. Demand elements from these forecasts will be used in the next stage of the study to help in the development of facility requirements.

TABLE 3-9
DEMAND FORECAST SUMMARY

Aviation Demand Element	1999	2005	2010	2020
Based Aircraft	61	69	74	85
Annual Operations				
GA Local	16,262	18,392	20,812	26,664
GA Itinerant	20,698	23,408	26,488	33,936
Military	500	500	500	500
TOTAL	**37,500**	**42,300**	**47,800**	**61,100**
Design Hour Operations	21	23	26	34
Annual Instrument Approaches	2,886	3,260	3,689	4,727

Source: C&S Engineers, Inc.

The aviation demand forecast for Floyd Bennett Memorial Airport indicates steady growth for aviation activities throughout the forecast period. The based aircraft forecast was correlated and supported by socioeconomic data and local interest in leasing hangar space at the airport. Socioeconomic data included economic indicators and population growth figures along with information provided by airport representatives and the pilot survey.

The aviation demand forecasts operations in accordance with regional and national aviation growth rates. The forecast was also developed to accommodate expected business growth in the area. Again, the socioeconomic data supported the consistent increase of activity at the airport. This forecast is consistent with the FAA's 2004 FAA TAF.

The summer months hold much activity for Warren County and the airport, as tourism is booming in the area. This is reflected at the airport in the peak period forecast as a doubling of activity is seen during July and August at the airport. Monthly fuel sales were examined to establish when the peak activities occur at the airport and how they compare to the rest of the year.

Following this development of aviation demand forecasts for Floyd Bennett Memorial Airport, the airside and landside facilities requirements are analyzed. The analysis identifies areas for development at the airport to accommodate its growth throughout the forecast period.

Chapter 4 - Facility Requirements

This section identifies the requirements for airside and landside facilities to accommodate the forecast demand level and to meet the design criteria for the critical aircraft as defined in Section 4.01. Facility planning should be based on a balance of airside and landside capacity. Airside facilities, as described in this report, include the runways, taxiways, hangar area, aircraft apron area, FBO facilities, airfield instrumentation and lighting and fuel storage.

Facility requirements have been developed for the various airport functional areas and are presented in the following sections:

Airside Facility Requirements
- -Airfield Hourly Capacity
- -Annual Service Volume
- -Runways and Taxiways
- -Hangar Area Capacity
- -Aircraft Apron Area Capacity
- -FBO Facilities
- -Instrumentation and Lighting
- -Fuel Storage Capacity

Landside Facility Requirements
- -Terminal Building
- -Aircraft Rescue and Firefighting Facilities (ARFF)
- -Auto Parking and Ground Access
- -Property

4.01 Critical Aircraft and Design Standards

The appropriate airside design criteria is based primarily on the selection of a critical or design aircraft that is expected to, or already does use the airport routinely. Consultation with airport representatives and with local pilots indicate that the most demanding aircraft based on physical characteristics utilizing the airfield is a G-IV aircraft having an Airport Reference Code (ARC) of D-II. Although there are not currently 250 annual departures of the G-IV aircraft, there are approximately 200 annual operations of the aircraft owned by a local businessman and there are well over 250 departures of design group III aircraft, including Gulfstream II's, III's, and IV's, and various challenger and citation models. Because there is not a significant difference in airport design standards for a Gulfstream IV and design group III aircraft, it is recommend the G-IV be the critical aircraft for Floyd Bennett Memorial Airport. Appendix G, Supplemental Runway Length Analysis provides additional data supporting the G-IV selection as the critical design aircraft.

In addition, according to the general aviation demand forecast for operations prepared as part of the master plan, the likelihood exists for corporate jet operations to expand at the airport. Corporate jets using the Airport include aircraft such as the G-IV. The G-IV has an ARC of

D-II and will be within the airfield separations and dimensional requirements of the current critical aircraft.
Again, it is recommended for future design purposes that the critical aircraft for the planning period be a G-IV and that an ARC designation for Runway 1-19 be D-II. The recommended ARC designation for Runway 12-30 at Floyd Bennett Memorial Airport is B-II.

FAA Advisory Circular 150/5300-13, *Airport Design*, identifies the design standards to be maintained at the Airport. These design criteria provide a guide for airport designers to assure a reasonable amount of uniformity in airport landing facilities. Any criteria involving widths, gradients, separations of runways, taxiways, and other features of the landing area must necessarily incorporate wide variations in aircraft performance, pilot technique, and weather conditions. The FAA design standards provide for uniformity of airport facilities and also serve as a guide to aircraft manufacturers and operators with regard to the facilities, which may be expected to be available in the future.

The specific airport design standards listed below (Table 4-1) have been applied assuming aircraft usage by Airplane Design Group II (wingspans up to but not including 79 feet) for Runway 1-19 and show the existing conditions at the Airport.

TABLE 4-1
AIRPORT DESIGN STANDARDS-RUNWAY 1-19

Item Design Criteria:	Design Standards R/W 1-19 D-II	Existing Conditions
Runway Width	100'	150’
Runway Centerline to Taxiway Centerline	300’	300’
Aircraft Parking Area	400'	400’
Taxiway Width	35'	50’
Taxiway Safety Area Width	79'	79’
Taxiway Object Free Area Width	131'	131’
Runway Safety Area		
- Width	500'	500’
- Length (beyond runway end)	1000'	1000’
Runway Object Free Area		
- Width	800'	800’
- Length (beyond runway end)	1000'	1000’

Source: FAA Advisory Circular 150/5300-13 and C&S Engineers, Inc.

Design standards for aircraft usage by Airplane Design Group II, with wingspans up to but not including 79 feet are used for Runway 12-30. The FAA does permit an airport with two or more runways to have more than one ARC. It is not necessary to apply the design standards of Runway 1-19 to the crosswind Runway 12-30 based on the most likely users of the runway being small (12,500 pounds or less) aircraft. The design standards for Runway 12-30 are outlined and compared to existing conditions in Table 4-2.

TABLE 4-2
AIRPORT DESIGN STANDARDS-RUNWAY 12-30

Item Design Criteria:	Design Standards R/W 12-30 B-II	Existing Conditions
Runway Width	75'	100’
Runway Centerline to Taxiway Centerline	240'	240’
Aircraft Parking Area	250'	500’
Taxiway Width	35'	40’
Taxiway Safety Area Width	79'	79’
Taxiway Object Free Area Width	131'	131’
Runway Safety Area		
- Width	150'	150’
- Length (beyond runway end)	300'	300’
Runway Object Free Area		
- Width	500'	500’
- Length (beyond runway end)	300'	300’

Source: FAA Advisory Circular 150/5300-13 and C&S Engineers, Inc.

4.02 Airside Facility Requirements

In this section, the existing airfield capacity at Floyd Bennett Memorial Airport is compared with the forecast levels of aviation activity. From this analysis, facility requirements for the planning period will be developed by converting any identified capacity deficiencies into detailed needs for new airport facilities.

Airfield capacity, as it applies to Floyd Bennett Memorial Airport, 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 include the following:

- Hourly Capacity of Runways: The maximum number of aircraft operations that can take place on the runway system in one hour.

- Annual Service Volume: The annual capacity or a maximum level of annual aircraft operations that can be accommodated on the runway system with an acceptable level of delay.

A variety of techniques have been developed for the analysis of airfield capacity. The current technique accepted by the FAA is described in the FAA Advisory Circular 150/5060-5, **Airport Capacity and Delay**. The Airport Capacity and Delay Model (ACDM) uses the following inputs to derive an estimated airport capacity:

- Airfield layout and runway use
- Meteorological conditions
- Navigational aids
- Aircraft operational fleet mix

- Touch-and-Go operations.

Each input used in a calculation of airfield capacity is described in the following sections.

AIRFIELD LAYOUT AND RUNWAY USE

The airport layout refers to the location and orientation of runways, taxiways, and other facilities. Currently, Floyd Bennett Memorial Airport has two runways with a system of taxiways, which access the ends of Runways 1, 19 and 30. A series of access taxiways connect the landside facilities to the runways. Runway 12 has no taxiway access.

METEOROLOGICAL CONDITIONS

Wind conditions are of prime importance in determining runway use and orientation. The prevailing wind and visibility conditions determine the direction in which takeoffs and landings may be conducted and the frequency of use for each available runway.

For the purpose of this study, the terms visual flight rules (VFR) and instrument flight rules (IFR) are used as measures of ceiling and visibility. VFR conditions occur when the ceiling is at least 1,000 feet and visibility is three miles or greater. During these conditions, pilots fly on a see-and-be-seen basis. IFR conditions occur when the ceiling is less than 1,000 feet or visibility drops below three miles. In IFR weather, the FAA air traffic control system assumes responsibility for safe separation between aircraft.

NAVIGATIONAL AIDS

FAA's ACDM uses information concerning IFR capability in the capacity calculation. Airports with instrument capabilities are able to operate during IFR conditions and thus are open a greater percentage of the year than similar VFR-only airports. The navigational aids available at Floyd Bennett Memorial Airport have been described in Section 2.16.

AIRCRAFT OPERATIONAL FLEET MIX

The FAA's Airport Capacity Model also requires that total annual operations be converted to operations by specific aircraft classification category. The capacity 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 4-3. The classifications that apply to Floyd Bennett Memorial Airport's fleet mix are Classes A, B, and C.

TABLE 4-3
FLEET CLASSIFICATION CATEGORIES

Class A: Small single-engine, gross weight 12,500 lbs. or less	Examples:	Cessna 172/182 Beech Bonanza	Mooney 201 Piper Cherokee/Warrior
Class B: Twin-engine, gross weight 12,500 lbs. or less	Examples:	Beech Baron Cessna Citation 1	Mitsubishi Mu-2 Piper Navajo
Class C:Large aircraft, gross weight 12,500 lbs. to 300,000 lbs.	Examples:	Boeing 727/37/57 Gulfstream IV	Douglas DC-9 Lear 35/55
Class D:Large aircraft, gross weight more than 300,000 lbs.	Examples:	Boeing 747 Lockheed 1011-250	Airbus A-300/310 Douglas DC-8-60/70

Source: C&S Engineers, Inc.

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. The primary purpose of touch and go operations is for the training of student pilots. Typically, touch and go operations occur in greater numbers at smaller airports or airports with large flight schools.

4.02-1 Hourly Capacity

The FAA's Airport Capacity Model combines information concerning runway configuration, runway usage, meteorology, operational fleet mix, and touch and go operations to produce an hourly capacity of the airfield. A weighted hourly capacity combines the input data to determine a base for each VFR and IFR operational runway use configuration at the airport. Each hourly capacity base is assigned a proportionate weight (based on the time each is used) in order to determine the weighted hourly capacity of the entire airfield.

The VFR and IFR hourly capacities for Floyd Bennett Memorial Airport are estimated to be 98 and 59 operations per hour, respectively. Design hour operations forecasts range from 22 in 2005 to 32 in 2020. As shown on Table 4-4, the airfield will have sufficient hourly capacity to meet design hour and peak period demands. Appendix E contains a copy of the Airport Design Computer Model capacity and delay outputs.

TABLE 4-4
HOURLY CAPACITY SUMMARY

Year	Design Hour Operations	VFR Hourly Capacity[1]	IFR Hourly Capacity[1]	VFR/IFR Capacity Ratio
1999 (Existing)	21	76	59	27.6/35.6%
2005	23	76	59	30.3/39.0%
2010	26	76	59	34.2/44.1%
2020	34	76	59	44.7/57.6%

[1] FAA Advisory Circular 150/5060-5

Source: C&S Engineers, Inc.

4.02-2 Annual Service Volume

An Airport's Annual Service Volume (ASV) has been defined by the FAA as "a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time." Therefore, ASV is a function of the hourly capacity of the airfield and the annual, daily, and hourly demands placed upon it. ASV is estimated by multiplying the daily and hourly operation ratios by a weighted hourly capacity.

At Floyd Bennett Memorial Airport the Northern New York RASP provided an ASV of 171,300 for present conditions. Compared to the projection of 61,100 operations by the year 2020, it is evident that airfield capacity is not a constraining factor to growth of the airport. Table 4-5 summarizes the ASV relationships developed in this chapter.

TABLE 4-5
ANNUAL SERVICE VOLUME SUMMARY

Year	Annual Operations	Annual Service Volume[1]	Annual Capacity Ratio
1999	37,500	225,000	16.6%
2005	42,300	225,000	18.8%
2010	47,800	225,000	21.2%
2020	61,100	225,000	27.3%

[1] FAA Advisory Circular 150/5060-5

Source: C&S Engineers, Inc.

4.02-3 Runways and Taxiways

The requirements for runways and taxiways may be described in a number of terms. In this study, the following descriptors are used:

- Runway orientation
- Runway length and width
- Pavement strength
- Taxiway system.

RUNWAY ORIENTATION

The orientation of runways for takeoff and landing operations is primarily a function of wind velocity and direction, together with the ability of aircraft to operate under adverse conditions. As a general rule, the primary runway at an airport is oriented as closely as practicable in the direction of the prevailing winds. The most desirable runway configuration will provide the largest wind coverage for a given maximum crosswind component.

The crosswind component is the vector of wind-velocity and direction which acts at a right angle to the runway. Further, runway wind coverage is that percent of time in which operations can safely occur because of acceptable crosswind components. The desirable wind coverage criterion for a runway system has been set by the FAA at 95 percent with a 16 knot crosswind component for an airport category D-II airport. The combination of runways at Floyd Bennett Memorial Airport exceeds the FAA criteria and provides 98.4% wind coverage at 16 knots and 95.3% wind coverage at 13 knots.

RUNWAY LENGTH AND WIDTH ANALYSIS

Runway length requirements are dependent upon the flight characteristics of the aircraft which the runway is intended to serve. The weight of the aircraft, the thrust developed by its engines, field elevation, temperature, non-stop flight distance, and the amount of fuel needed for the flight interrelate to determine the length of runway required for takeoff and landing with a desired payload (passengers plus cargo).

A review of the runway length requirements for Floyd Bennett Memorial Airport to accommodate many of the more demanding aircraft and using as an example the Gulfstream IV (G-IV), operating at its maximum take-off weight (MTOW), indicates a required runway length of 5,280 feet for takeoff. The present length of Runway 1-19 is 5,000 feet, which is adequate under constrained conditions (e.g., lower temperatures or limited load). However, alternatives could be developed that include a runway extension of at least 500 feet and up to 1,000 feet to show how this length could be accommodated if required in the future.

A 500-foot extension would allow unconstrained use by the current critical aircraft (G-IV). A 1,000-foot extension would enable use by larger jets that are expected at the airport by the end of the forecast period. For example, the Gulfstream V (G-V) requires 5,990 feet of runway for take off at its maximum take-off weight. The current length of Runway 1-19 is expected to be adequate in the short-term with the understanding that limitations of load and trip length may affect some operations for aircraft. However, if the design aircraft changes in the future and the airport attracts larger jets a 1,000-foot extension may be appropriate.

Runway width is a dimensional standard that is based upon the physical characteristics of aircraft using the airport. The physical characteristic of importance is wingspan. FAA Airplane Design Group II (wingspans up to but not including 118 feet) is used for defining airport dimensional standards. FAA AC 150/5300-13 specifies a runway width of 100 feet. Runway 1-19 exceeds this requirement with a width of 150 feet. The consultant recommends that the current runway width be maintained throughout the planning period. In the case of runway width standards, it is cost effective to maintain extra runway width, based on the cost to remark the runway and relocate runway lighting.

Runway 12-30 measures 4,000 feet by 100 feet. FAA Advisory Circular 150/5325-4A states that a crosswind runway should have a length of at least 80 percent of the primary runway length. The runway length meets this standard. The current width of 100 feet for Runway 12-30 exceeds the recommended design standard of 75 feet for an Airplane Design Group II runway. The consultant recommends that the current runway width be maintained throughout the planning period.

PAVEMENT STRENGTH

The existing pavement strength of Runway 1-19, the primary runway at the Airport, is 110,000 pounds for dual wheel landing gear. The primary runway pavement strength is sufficient to meet the needs of a D-II aircraft, such as the G-IV, which has dual wheel landing gear and a maximum take off weight of 73,200 pounds.

Runway 12-30 has existing pavement strength of 53,000 pounds for dual-wheel landing gear. This pavement strength is adequate for most aircraft that use the runway.

TAXIWAY SYSTEM

The taxiway system for Floyd Bennett Memorial Airport should complement the runway system by providing safe access to and from runway and landside areas. At present, Runway ends 1, 19, and 30 are accessed by taxiways (Table 4-6). Runway 12 has no taxiway access.

TABLE 4-6
TAXIWAY ACCESS

Taxiways	Access	Dimensions
A	Term. apron to RW 19 end	50x2300'
B	Term. apron to RW 1-19	50x750'
C	Term. Apron to intersection of RW 1-19 and 12-30	50x800'
D	Term. Apron to RW 30 end	40x900'
E	RW 30 to RW 1 end	40x1200'

Source: C&S Engineers, Inc.

In terms of taxiway design, based on FAA Advisory Circular 150/5300-13 standards, the taxiway system should be designed to a minimum width of 35 feet, and parallel taxiways should have a separation distance of 400 feet from runway centerline to taxiway centerline for Runway 1-19 and 250 feet for Runway 12-30. The taxiway system should have the same strength as the runway system. Table 4-6 shows the existing dimensions of the taxiways.

Currently, there is no access to the Runway 12 end. A parallel taxiway would be necessary to provide access to Runway 12. The primary benefit of the taxiway would be improving the safety of the airport by allowing safe access and circulation of aircraft off the runway by preventing back taxiing.

4.02-4 Hangar Area (Conventional and T-Hangars)

Hangar requirements for a general aviation facility are a function of the number of based aircraft, the type of aircraft to be accommodated, owner preferences, and area climate. As a result, hangar demand is "demand-based" and is not necessarily tied to a time period.

Prefabricated conventional, plane-port, and T-hangar units are available from a variety of manufacturers throughout the nation. Storage space for based aircraft was determined using guidelines suggested in manufacturers' literature. Typical aircraft sizes were also reviewed in light of the evolution of business aircraft size. Conventional hangar space was based upon a standard of 1,200 square feet for a single-engine aircraft, 1,400 square feet for a multi-engine piston aircraft, and 1,800 square feet for a turboprop or turbojet aircraft. A standard of 1,400 square feet per T-hangar or plane-port unit was used in calculating area requirements. These hangar areas were then applied to the based aircraft forecasts to determine the actual hangar area requirements for each hangar type. Tie-down space was allocated as part of the itinerant airport apron area and is addressed later in this chapter. The following assumptions were made regarding the type of hangar needed for each type of aircraft:

Percent of Aircraft Type	Type of Storage
100% of Turbojet Aircraft	Conventional Hangar
55% of Multi-Engine Piston	Conventional Hangar
35% of Multi-Engine Piston	T-Hangar
10% of Multi-Engine Piston	Parking Apron
20% of Single-Engine Piston	Conventional Hangar
60% of Single-Engine Piston	T-Hangar
20% of Single-Engine Piston	Parking Apron.

Using the above assumptions combined with the forecast of fleet mix (shown previously in Table 3-3), Table 4-7 sets forth the demand requirements for hangar space at Floyd Bennett Memorial Airport. It should be noted that these recommendations are not rigid. For example, the shifting of space requirements between conventional and T-hangars is left to local preference.

TABLE 4-7
HANGAR AREA DEMAND (SQUARE FEET)

Item	Existing (1999)	2001-2005 (Phase I)	2006-2010 (Phase II)	2011-2020 (Phase III)
Conventional				
Turboprop/jet		5,400	9,000	16,200
Single-engine piston		14,400	14,400	15,600
Multi-engine piston		2,800	4,200	7,000
FBO Maintenance Hangar		9,900	9,900	9,900
SUBTOTAL	**13,750 sf**	**32,500 sf**	**37,500 sf**	**48,700 sf**
T-Hangar				
Single-engine		51,800	51,800	56,000
Multi-engine		1,400	2,800	4,200
SUBTOTAL	**19,750 sf**	**53,200 sf**	**54,600 sf**	**60,200 sf**
GRAND TOTAL	**33,500 sf**	**85,700 sf**	**92,100 sf**	**108,900 sf**

Source: C&S Engineers, Inc.

4.01-5 Aircraft Apron Area Capacity

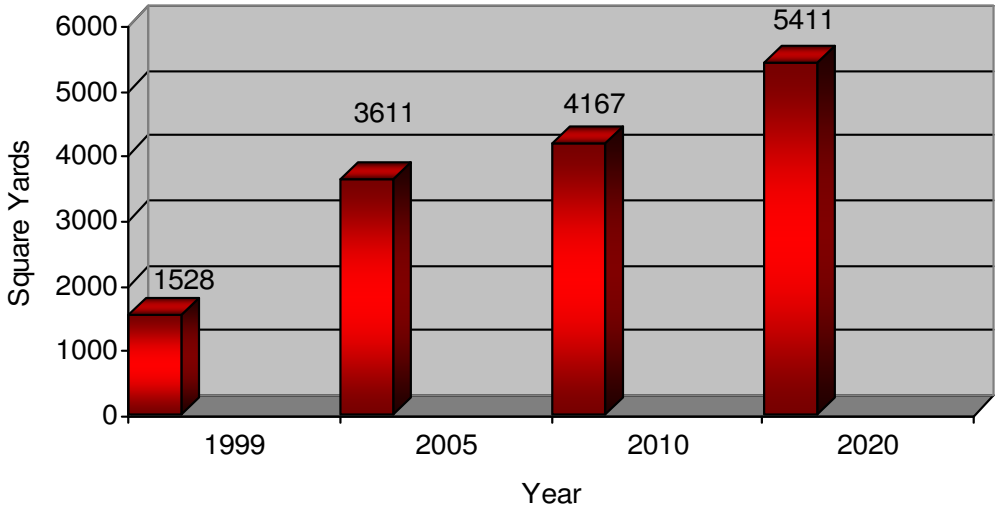
The aircraft apron area consists of the hangar/FBO apron, based aircraft apron, and itinerant aircraft parking apron. Estimations of the needed apron areas are presented in the following sections. Apron area needs to be expanded to meet the forecasted demand.

HANGAR APRON AREA (CONVENTIONAL)

Hangar apron demands were established using an aviation industry planning guideline which indicates a need to develop a hangar apron equal to the hangar area itself. T-hangars do not require aprons but can be adequately accessed using hangar taxiways. The dimensions of these taxiways will be dependent on the number of T-hangars and their configuration at the airport. As displayed in Chart 4-1, hangar apron demand for

conventional hangars is expected to increase from approximately 2,500 square yards in 2005 to over 4,300 square yards in 2020.

CHART 4-1
CONVENTIONAL HANGAR APRON REQUIREMENTS

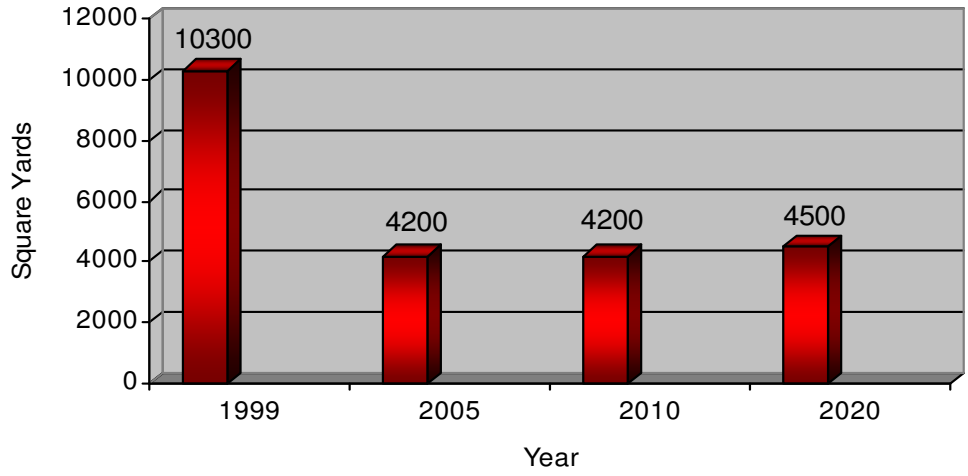


Source: C&S Engineers, Inc.

BASED AIRCRAFT APRON

The based aircraft parking area is planned to ensure adequate tie-down space for those based aircraft that do not require hangar storage. Currently, the airport has approximately 10,300 square yards of paved tie-down area. The paved tie-down area requirements were calculated using a standard of 300 square yards per aircraft. Aircraft identified as desiring tie-down space include 20% of single-engine piston aircraft and 10% of multi-engine piston aircraft and 100% of rotorcraft. Applying these standards, Chart 4-2 depicts the based aircraft apron requirements, which are expected to be 4,500 square yards in 2020. (See Table 3-3, Based Aircraft Fleet Mix Forecast).

CHART 4-2
BASED AIRCRAFT APRON REQUIREMENTS



Source: C&S Engineers, Inc.

ITINERANT PARKING APRON

Areas designated for the parking of transient (visiting) aircraft are called "itinerant aprons." The itinerant apron areas are also used by based aircraft for loading, fuel, and other activities. The size of such an apron required to meet itinerant demand was estimated using the following methodology:

- Assume that a busy day (design day) at Floyd Bennett Memorial Airport is 100 percent busier than the average day.

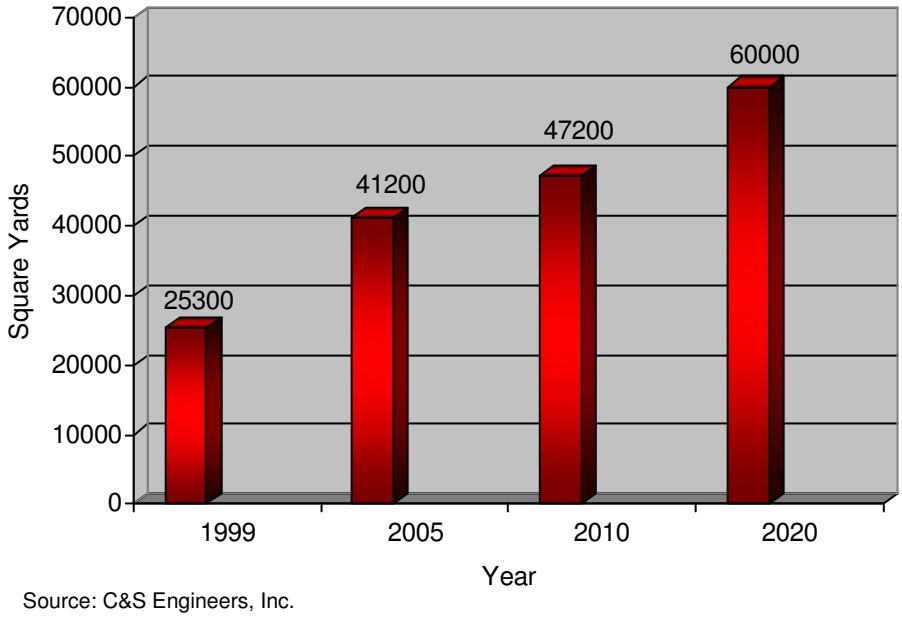
- Based on the FAA Airport Master Record Form 5010, the local/itinerant operations ratio is 44/56.

- Since 50 percent of the itinerant operations are departures, typically only 50 percent of the itinerant operations represent aircraft on the ground in need of a parking area. However, during the busy summer months, the airport is busiest during the weekend, and in fact, many itinerant flights are weekend commuters that require tie-down space for two or three days. Thus, assume that 80 percent of the itinerant aircraft will be on the apron at any one time during the day.

- Itinerant ramp requirements for general aviation aircraft (Airplane Design Group II) likely to use Floyd Bennett Memorial Airport indicate that 400 square yards per itinerant aircraft is a reasonable allotment of space.

Applying this approach to the general aviation itinerant operations forecast yields a growth in the demand for apron from 41,200 SY up to 60,000 SY in 2020 as shown in Chart 4-3.

CHART 4-3
ITINERANT AIRCRAFT APRON REQUIREMENTS



Source: C&S Engineers, Inc.

4.02-6 Fixed Base Operator Facilities

Practices concerning fixed base operator (FBO) and maintenance facilities vary. As such, FBO and maintenance area requirements will differ according to the services provided. A frequently used criterion, however, is to compute FBO and maintenance areas as ten percent of the total aircraft hangar area or 5,000 square feet, whichever is greater. An equal amount of apron area is required for an FBO maintenance ramp. Thus, for Floyd Bennett Memorial Airport, a 9,900 square foot maintenance hangar with 9,900 square feet (1100 SY) of adjacent apron space would be the minimum recommendation.

The FBO currently occupies a hangar that is approximately 13,750 square feet. This space is adequate for planes that need hangar space, however the FBO needs additional maintenance and administration space. The condition of the hangar is poor and needs to be heated and insulated.

4.02-7 Airfield Instrumentation and Lighting

Instrumentation and lighting at an airport is a prime concern of all pilots and residents. Determining the suitable instrumentation and lighting standards has a prominent influence on airside and landside development.

As a transport category airport in northern New York, all weather operating capability increases the safety of operations at Floyd Bennett Memorial Airport. Table 4-8 lists instrumentation and lighting systems recommended for the airport based upon forecasts, the projected role of the airport, and the standards depicted in FAA Order 7031.2C, *Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services*.

TABLE 4-8
AIRFIELD INSTRUMENTATION AND LIGHTING

Item	Existing	Proposed
Lighting		
-Runway 1-19	HIRL,MITL	HIRL, MITL
-Runway 12-30	MIRL,MITL	MITL, REIL
Visual Aids	VASI (R/W 1,19) MALSR RW 1	PAPI (R/W 1,19, 12 and 30), REIL RW (1,19,12, and 30)
Instrumentation	ILS (R/W 1), VOR/DME or GPS RW 19, NDB	same

Legend:

HIRL	High Intensity Runway Lights
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
VASI	Visual Approach Slope Indicator
PAPI	Precision Approach Path Indicator
NDB	Non-directional Beacon
REIL	Runway End Identification Lights
ILS	Instrument Landing System
GPS	Global Positioning System
VOR/DME	Omnidirectional Range/Distance Measuring Equipment
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights

Source: C&S Engineers, Inc.

Runway 19 currently has a non-precision VOR-DME or GPS approach. The approach can be improved by replacing the VASI's with PAPI's, and removing obstructions that may exist. The FAA has a GPS instrument approach planned for Runway 19 in 2003. A feasibility study on the Runway 19 approach needs to be completed before a new instrument approach is installed. The limited occurrence of weather creating IFR conditions for Runway 19 does not justify an ILS. Weather data provided by the National Climactic Data Center (NCDC) indicates that winds from the south that may create IFR conditions for the 19 approach occur approximately 16 days per year (4% of the year). This is based on 24,952 hourly observations during the years 1997-1999.

4.02-8 Fuel Storage Requirements

The fuel storage requirements analysis based on sales records provided by airport management performed at the airport and the growth of forecasted operations. According to airport records, Jet A fuel sales range between 4,000 to 5,000 gallons per week in July and August. The fuel tanks get refilled up to four times a month during the summer and once a month during the winter in order to maintain adequate fuel supply. The JetA fuel storage

requirements forecast has been developed based on fuel sales to accurately represent the fuel storage capacity at the airport. This forecast was generated by comparing the growth rate of forecast operations to the amount of fuel sold at the Airport based on fuel sale records provided by the FBO. Table 4-9 shows the JetA fuel storage requirements.

TABLE 4-9
JETA FUEL STORAGE REQUIREMENTS
(PEAK TWO WEEK)

Forecast Year	Peak Two Week Consumption
1999 (Existing)	11,000
2005	12,700
2010	14,600
2020	19,100

Source: C&S Engineers, Inc.

Table 4-10 shows the Avgas fuel storage requirements.

TABLE 4-10
AVGAS FUEL STORAGE REQUIREMENTS
(PEAK TWO-WEEK)

Forecast Year	Peak Two Week Consumption
1999 (Existing)	3,446
2005	4,055
2010	4,644
2020	6,091

Source: C&S Engineers, Inc.

Based on the fuel storage analysis there is adequate storage capacity for Avgas throughout the planning period. The analysis shows that additional JetA fuel storage tanks will be necessary towards the end of the 20-year planning period.

4.03 Landside Facility Requirements

The planning of landside facilities should be based upon a balance of airside and landside capacity. The determination for terminal and support area facilities has been accomplished for the three future planning periods.

This section describes the guidelines and methodologies used to develop facility requirements for the general aviation areas of Floyd Bennett Memorial Airport.

The following categories were examined in this analysis:

- General Aviation Terminal Building,
- Aircraft Rescue and Fire-Fighting Equipment (ARFF)
- Auto Parking and Ground Access
- Land

4.03-1 General Aviation Terminal Building

A general aviation terminal is needed to provide space for management offices, lounge areas, restrooms, food services, and other areas for the needs of pilots and passengers.

The FAA's approach for calculating general aviation terminal requirements uses operational peaking characteristics to determine the size of the terminal building. The method relates general aviation peak-hour pilots and passengers to the functional areas within the terminal to produce overall building size. Table 4-11 shows the standard square footage requirement per passenger. The existing terminal facility is approximately 2500 square feet, has recently been refurbished, and is in excellent condition.

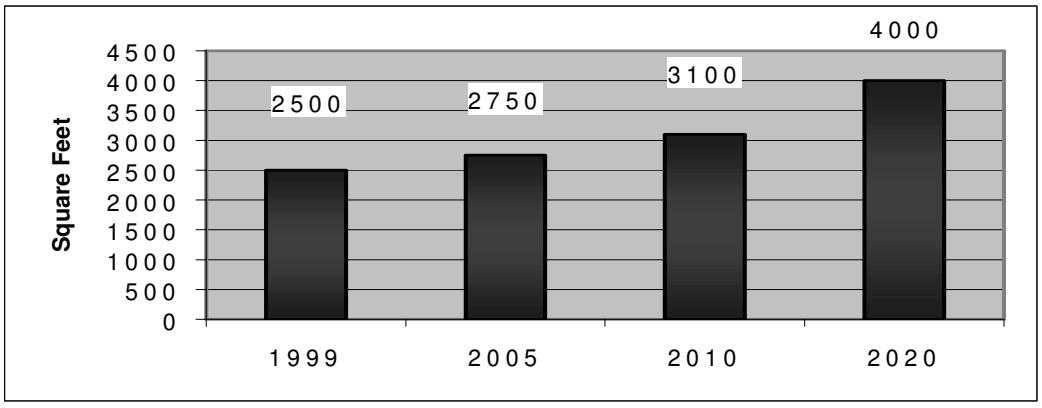
TABLE 4-11
GENERAL AVIATION BUILDING AREA REQUIREMENTS

Functional Area	Area Per Peak Hour Pilot/Passenger
Waiting Lounge	15.0 SF
FBO Operations	3.0 SF
Public Conveniences	2.0 SF
Concession Area	5.0 SF
Circulation, Storage, HVAC	25.0 SF
TOTAL	**50.0 SF**

Source: Federal Aviation Administration, **Aviation Demand and Airport Facility Requirement Forecast for Medium Air Transportation Hubs** (Washington, D.C., 1969).

Using the standards in Table 4-11, the recommended general aviation terminal function size for each design year is presented in Chart 4-4. Numbers of peak hour passengers were derived by assuming 2.5 passengers and pilots per general aviation design hour operation. A 4,000 square foot terminal building will satisfy requirements in 2020.

CHART 4-4
GENERAL AVIATION TERMINAL BUILDING REQUIREMENTS



Source: C&S Engineers, Inc.

4.03-2 Aircraft Rescue and Firefighting Facilities (ARFF)

The Federal Aviation Regulation Part 139.315 establishes a system of indexing airports for a level of fire protection. The airport index is determined by the length of the aircraft with five or more daily departures.

Floyd Bennett Memorial Airport's index has been determined as Index A. Index A airports are served by aircraft no more than 90 feet in length. The minimum rescue and fire-fighting equipment and agents required for this index are as follows:

One vehicle carrying at least:

- 500 pounds of sodium-based dry chemical or halon 1211; or
- 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons.

The airport currently has the following ARFF equipment:

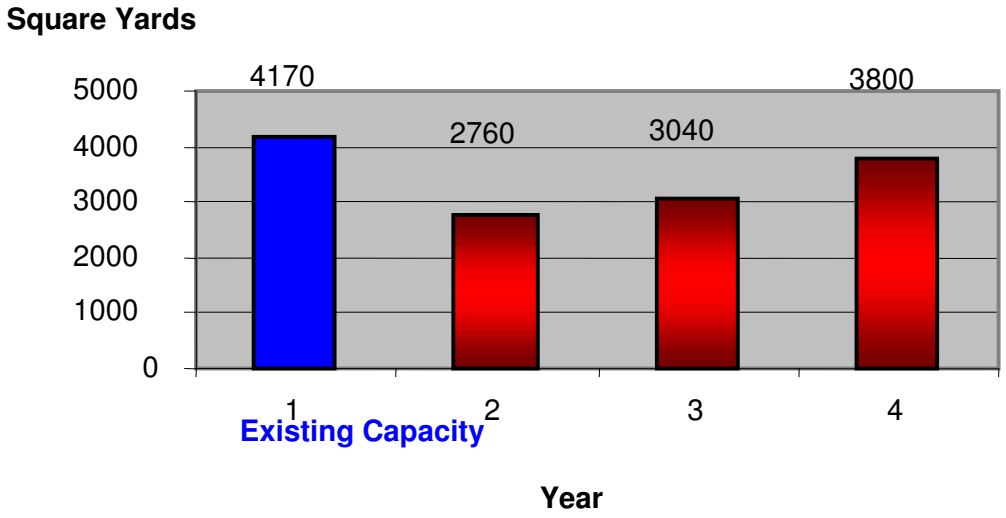
- 1990 Chevrolet ½ Ton Truck – In fair condition; truck is not needed to meet FAA Index A requirements.
- 1992 Ford Truck – In good condition, meets FAA Index A requirements.

The existing fire protection equipment is sufficient for the airport. Part 139 does not require any other improvements to the Airport.

4.03-3 General Aviation Related Automobile Parking

The number of auto spaces required at an airport is dependent upon the level of general aviation aircraft activity at the facility. The methodology for determining parking needs relates peak hour pilots, passengers, and airport employees to the number of parking spaces required. Numbers of peak hour pilots and passengers were previously derived for the terminal building requirements. The number of employees relating to the general aviation function of an airport such as Floyd Bennett Memorial Airport is estimated at 1 employee for every 7.2 based aircraft. This would result in 10 employees at the airport in 2005. The number of auto parking spaces equals the sum of the peak hour pilots/passengers and employees at the airport. The number of required parking spaces is converted into paved area by using a planning standard of 40 square yards per vehicle space (see Chart 4-5). The current size of the parking lot is 4,170 (adequate for 110 parking spaces) and in 2020, auto parking requirements are expected to be 3,680 square yards (adequate for 92 cars). Event parking is an important function of the airport. Turf auto parking is required when the airports paved lots are filled, which occurs every year at the balloon festival. The turf area north of the existing auto parking lot is used for event parking and should be maintained for future auto parking.

CHART 4-5
AUTO PARKING AREA REQUIREMENTS



4.03-4 Property

The airport property currently consists of approximately 628 acres. The airport has acquired one parcel of land located south of the Runway 1 threshold. The parcel was owned by the Sullivan's and is approximately 26 acres. Acquisition of this property serves to protect the Runway Protection Zone's and approaches. In addition, acquisition of this property assures compatible land use and control of potential obstructions. The county has acquired a 54-acre parcel south of the Sullivan parcel that was owned by Forest Enterprises, Inc. In addition, the County obtained several large parcels of land that surround or about the airport property. These parcels are located south of the Runway 1 and 12 ends.

4.04 Airside and Landside Facility Requirements Summary

The preceding sections have identified the general aviation facility requirements for Floyd Bennett Memorial Airport. Tables 4-12 and 4-13 summarize the requirements by planning phase and area of need by comparing existing facilities to total airport demand for each period.

A runway extension may be appropriate for the primary runway (1-19) during the second half of the planning period if warranted by increased activity and/or more demanding aircraft. The alternatives phase will establish if a parallel taxiway will be necessary to provide safe access to Runway 12. Safety will be enhanced by the installation of PAPIs on both runways.

With the exception of the FBO maintenance facility and the county-owned maintenance buildings, landside facilities are generally adequate. The existing terminal building is appropriately sized in the short-term, but may need to be expanded an additional 1500 square feet by the end of the planning period. The existing itinerant apron needs to be expanded to accommodate usage through 2020. In addition, the demand for T-hangars currently exceeds the space available and the demand is expected to grow. Conventional and T-hangar space is required in the short term. FBO space is in poor condition and needs improvements such as

heating insulation and added office/maintenance space. The auto parking area is adequate and will satisfy the demand as aviation activity increases.

TABLE 4-12
AIRSIDE FACILITIES SUMMARY

Item	Existing (1999)	PHASE I (2001-2005)	PHASE II (2006-2010)	PHASE III (2011-2020)
Runways:				
1-19	5,000' x 150'	5,000' x 150'	5,500' x 150'	6,000' x 150'
12-30	4,000' x 100'	Same	Same	Same
Taxiways:				
1-19	Access Taxiway	Same	Same	Same
12-30			Full Parallel	Full Parallel
Lighting:				
1-19	HIRL, MITL, MALSR	HIRL, MITL, MALSR	HIRL, MITL, MALSR	HIRL, MITL, MALSR
12-30	MIRL, MITL	MIRL, MITL, REILS	MIRL, MITL, REILS	MIRL, MITL, REILS
Navigation Aids:	VASI, ILS (R/W 1,19), NDB	PAPI (RW 1-19 and 12-30), ILS (R/W 1,19), NDB	PAPI (RW 1-19 and 12-30), ILS (R/W 1,19), NDB	PAPI (RW 1-19 and 12-30), ILS (R/W 1,19), NDB

Legend:

HIRL	High Intensity Runway Lights
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
VASI	Visual Approach Slope Indicator
NDB	Non-directional Beacon
PAPI	Precision Approach Path Indicators
REIL	Runway End Identifier Lights
ILS	Instrument landing System
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights

Source: C&S Engineers, Inc.

TABLE 4-13
LANDSIDE FACILITIES SUMMARY

Item	Existing (1999)	Phase 1 (2001-2005)	Phase II (2006-2010)	Phase III (2011-2020)
Terminal:	2,424 SF	2,750 SF	3,100 SF	4,000 SF
Hangars:				
Conventional	0 SF	22,600 SF	27,600 SF	38,800 SF
T-Hangar	19,750 SF	53,200 SF	54,600 SF	60,200 SF
FBO	13,750 SF	9,900 SF	9,900 SF	9,900 SF
TOTAL	33,500 SF	85,700SF	92,100SF	108,900 SF
Apron:				
Itinerant	25,300 SY	41,200 SY	47,200 SY	60,000 SY
Based	10,300 SY	4,200 SY	4,200 SY	4,500 SY
FBO Maintenance	1,100 SY	1,100 SY	1,100 SY	1,100 SY
Hangar Apron	0 SY	2,514 SY	3,070 SY	4,316 SY
TOTAL	36,700 SY	49,000 SY	55,600 SY	69,900 SY
Auto Parking:				
# of Spaces	110	65	72	95
Area	4,400 SY	2,600 SY	2,880 SY	3,800 SY
Fuel Demand: (Two week peak)	100LL-11,965 AVGAS-3,080	100LL-13,521 AVGAS-3,542	100LL-15,323 AVGAS-4,004	100LL-19,588 AVGAS-5,236
TOTAL	**15,045**	**17,063**	**19,327**	**24,824**

Source: C&S Engineers, Inc.

In addition to the facility requirements generated from forecasted operations at the airport, it is recommended that the following items be addressed in proposed airport development alternatives.

AIRSIDE

The NYSDOT has identified that the safety area grades on Runway 12-30 are sub-standard. Grading work is necessary in order to achieve the FAA's longitudinal gradient standard of no more than a 5% negative grade. The Floyd Bennett Memorial Airport Capital Improvement Program (CIP) has a Runway 12-30 safety area improvement project planned for in the short-term.

Other projects that have been identified by the CIP as necessary airport improvements are the rehabilitation of the lighting circuitry for Runways 1-19, 12-30, and all taxiways, as well as the rehabilitation of Taxiways "B", "D" and "E."

LANDSIDE

The FBO hangar is in poor condition and is in need of improvements such as heating and insulation. The hangar is also too small for the storage of planes and maintenance operations. The existing hangar will be refurbished to accommodate maintenance operations. A new hangar will be required in order to create enough

space for the storage of planes, maintenance operations, and administrative duties. There is also a shortage of storage space for the airport's maintenance equipment. In order to prevent the year-around storage of maintenance equipment outdoors, a new garage is needed. The sand storage building is in poor condition and needs to be replaced.

A plan for the former FBO building needs to be developed that will either find a use for the building or dispose of it. It is a metal-skinned building on a metal frame, which is partially finished inside, in fair condition and is currently vacant.

Off airport property obstruction removal is planned for Runways 12-30 and 1-19 in the CIP. An obstruction plan which is currently underway and the acquisition of land will help define what obstructions exist and what steps need to be taken to remove them.

A perimeter fence is necessary to limit access to the airport to designated areas and help control wildlife from entering the airfield. The fence would be 6 to 8 feet high with several feet of fence extending below grade to prevent wildlife from digging under the fence. The fence would be equipped with approximately three cantilever gates equipped with electronic gate operators and appurtenances.

Other projects at Floyd Bennett Memorial Airport include the purchase of snow removal and sweeping equipment, pavement rehabilitation of the access road and vehicle parking area, and sanitary sewer service to the terminal building.

Chapter 5 - Environmental Study

5.01 Background

This chapter briefly discusses 22 specific categories of potential environmental impact to determine what effects would result from development at the airport. Before any major development (as defined by Federal Aviation Administration Order 5050.4A, *Airport Environmental Handbook)* would occur, a federal-level Environmental Assessment may need to be undertaken to fully assess any possible project-related environmental impacts. This evaluation is not a federal-level environmental assessment, but rather a brief review of the areas of potential environmental impacts. Environmental correspondence is included in Appendix F.

5.02 Noise

A range of aircraft, from small single-engine propeller driven airplanes to large business jets, fly in and out of Floyd Bennett Memorial Airport. Aircraft generated noise is generally the most obvious environmental impact at airports of all types. These impacts are strongly affected by the volume and type of traffic at the facility.

The impact of existing and future noise levels is described through the use of the Day-Night Average Sound Level (DNL) methodology, an official system for quantifying cumulative aircraft noise. DNL is an energy summation methodology that depicts the average aircraft generated sound over a 24-hour period. The FAA's Integrated Noise Model (INM) Version 6.0b was used to produce a set of nested contours (lines of equal cumulative noise exposure) based on a peak day's traffic during the summer months. The exposure levels which are determined are typically displayed as contours with values ranging from 65 to 75 DNL in five unit increments.

The DNL methodology assumes that flight operations are developed for a 24-hour day. Average flight operations are divided into two time periods: day and night. These time periods are defined relative to airport local time:

- Day 0700-2200 (15 hours)
- Night 2200-0700 (9 hours)

INM standard noise metrics, such as DNL, are associated with two metric weights (day and night multipliers). Weighting factors (multipliers) for day and night time periods are the number of equivalent aircraft operations relative to one aircraft operation during the day. For example, in the DNL metric, one night time operation is worth 10 day-time operations.

The DNL methodology considers the following factors in developing noise exposure contours:

- Aircraft and engine type (i.e., the source noise characteristics
- Mix of differing aircraft types
- Flight tracks and operational profiles
- Volume of daily operations by runway
- Runway elevation and runway length.

The DNL system is useful primarily as a means of gauging the degree of incompatibility of various land uses impacted by the differing levels of noise, and comparing the noise impacts between several different airports or variations in traffic levels. If this system is effectively used to control development in the airport vicinity, it can prevent noise sensitive development in areas which have unacceptable noise exposure. This does not necessarily mean that there will never be a noise complaint. Individuals react differently to specific events, as well as to elevated average levels of noise exposure. Thus, unusually noisy aircraft operating normally, or relatively quiet aircraft flying unusually close to neighborhoods, can trigger occasional or isolated complaints when no widespread noise problem may exist.

NOISE EXPOSURE CONTOURS

At Floyd Bennett Memorial Airport, an estimated total of 37,000 aircraft operations took place in 1999. The majority of these operations occur during the summer months and in order to model the "worst case" existing aircraft noise, the DNL for a peak summer day is modeled. Approximately 90 percent of the general aviation operations were by single engine aircraft and 5 percent by twin engine aircraft. The remaining 5 percent of operations performed are split between turboprop (2%) and jet (3%) operations. An estimated 40% of all operations are on Runway 1; 40% are on Runway 19; 5% are on Runway 12; and 15% are on Runway 30. All jet engine operations are performed on Runway 1-19, with a split of 50% of operations on Runway 1 and 50% of operations on Runway 19.

The resulting noise contours are shown on Figure 5-1. As shown, the area within DNL 65 dB, which is the generally accepted level for determining the onset of significant impacts, encompasses approximately 0.3 square miles, and extends north and south of the airport. The majority of the DNL 65 dB contour is contained on airport property or vacant land, but there are portions of two residential parcels that lie within the DNL 65 dB contour. The DNL 70 dB encompasses approximately 0.15 square miles and remains almost entirely on airport property.

Future noise contours have been developed for the five-year and 20-year operation forecasts using the same methodology. These noise contours are depicted on Figures 5-2 and 5-3. As shown, the area within the DNL 65 dB contour for the five-year forecast encompasses approximately 0.4 square miles and touches two residential parcels. The DNL 65 dB contour for the 20-year forecast covers approximately 0.45 square miles and portions of the same two residential parcels fall within the contour. However, no residences lie within the DNL 65 dB contour in either case.
To summarize, except for the aforementioned residential parcels, there are no schools, hospitals or other noise-sensitive land uses within the existing 5-year forecast, or 20-year forecast, DNL 65 or 70 dB contours at the airport.

5.03 Compatible Land Use

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport.

Land use compatibility standards have been developed through surveys of residents living near airports worldwide. The normal standards associated with the Day-Night Average Sound Level Methodology are shown on Table 5-1. These standards are incorporated from Federal Aviation Regulation (FAR) Part 150 and are intended as guidelines for development recommendations in noise exposure areas. All land uses are considered compatible below the DNL 65 level.

It is recognized here that there may be some impact occurring to a lower limit of DNL 55. The reasons for this may be varied. In some instances, individuals or community activities may be extremely noise sensitive (e.g., housing for the elderly, community facilities, schools, and libraries). In addition, these noise determinations are based on averages that may or may not reflect the actuality of the daily situations. For example, peak traffic levels may be considerably higher than the average. During the summer months of the year, local residents using outdoor living areas or who normally keep their windows open for ventilation may experience some annoyance. Thus, the standards are not meant to supersede local judgments concerning what is or is not acceptable in a given community, but rather to define levels which are normal and reasonable.

Figures 5-1, 5-2, and 5-3 show the contours overlaid on a land use map of the airport vicinity. Warren County Planning Department provided the land use data used in these figures. The following observations were made:

Land use surrounding the airport includes residential, commercial, industrial and vacant uses. Noise contours extend to the north and south of the airport property. North of the airport the land use is primarily residential and vacant. South of the airport the majority of land use is vacant with some scattered residential parcels.

The majority of noise impacts from the Floyd Bennett Memorial Airport are from the Primary 1-19 Runway, and the contours are fairly compact. For this reason, there are few land uses that are incompatible with the indicated noise levels. As previously noted there are portions of two residential parcels affected by the DNL 65 dB contours. The remaining land uses found under these DNL contours are airport property and vacant land.

Floyd Bennett Memorial Airport Master Plan

Existing Noise Contours

Existing Contours
- 65 DNL
- 70 DNL
- 75 DNL
- Runway
- Runway

Land Use
- Agricultural
- Commercial
- Industrial
- Open Space
- Public
- Residential
- Vacant Land

1" = 1,500 ft.

0 0.25 0.5 Miles

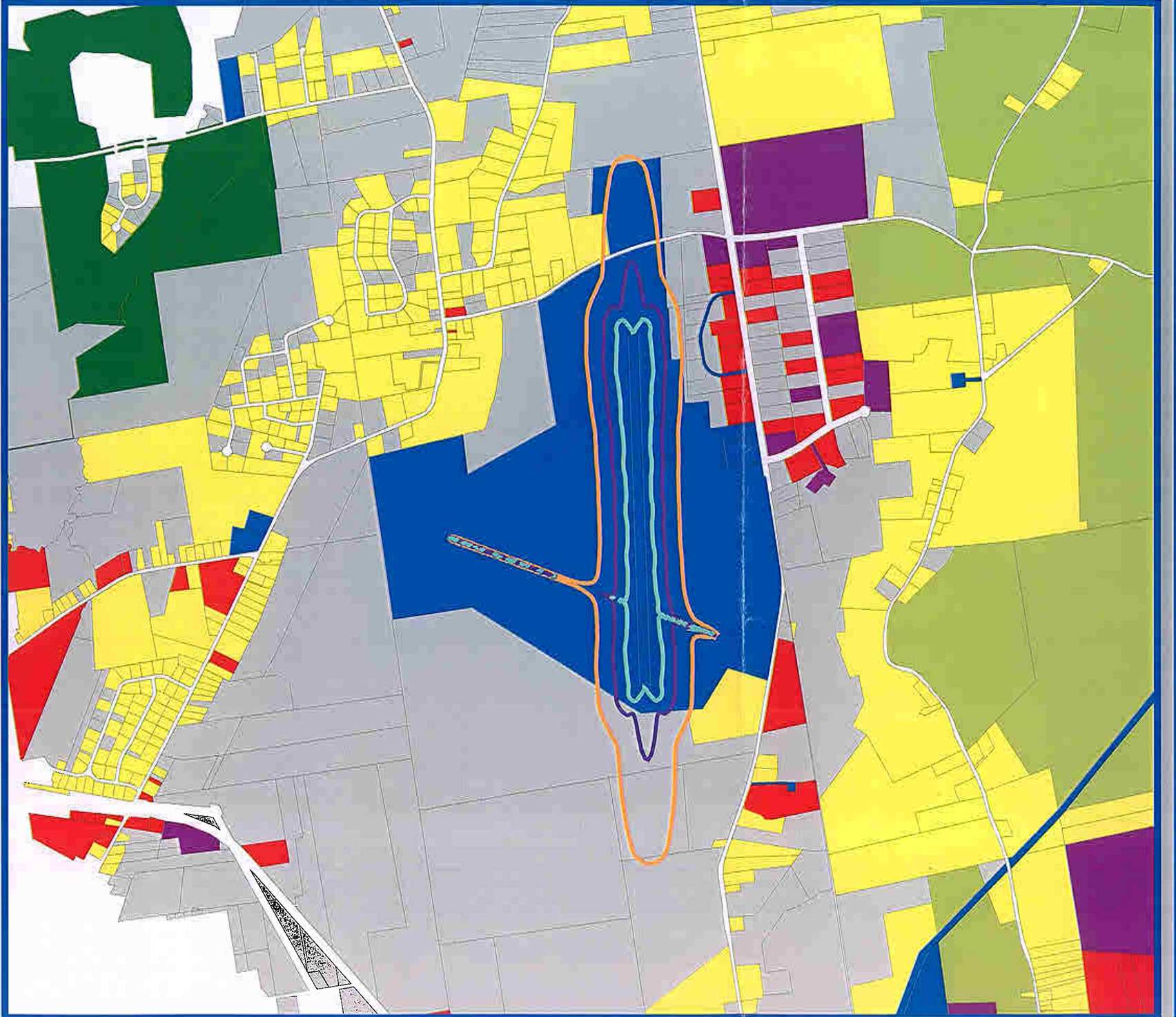
N

Figure 5-1

C&S COMPANIES
ENGINEERS
DESIGN BUILD
TECHNICAL RESOURCES
OPERATIONS

05/23/02

K:\WarrenCnty\projects\ground-access052302



Floyd Bennett Memorial Airport Master Plan

5 Year Forecasted Noise Contours

5 Year Contours
- 65 DNL
- 70 DNL
- 75 DNL
- Runway

Land Use
- Agricultural
- Commercial
- Industrial
- Open Space
- Public
- Residential
- Vacant Land

1" = 1,500 ft.

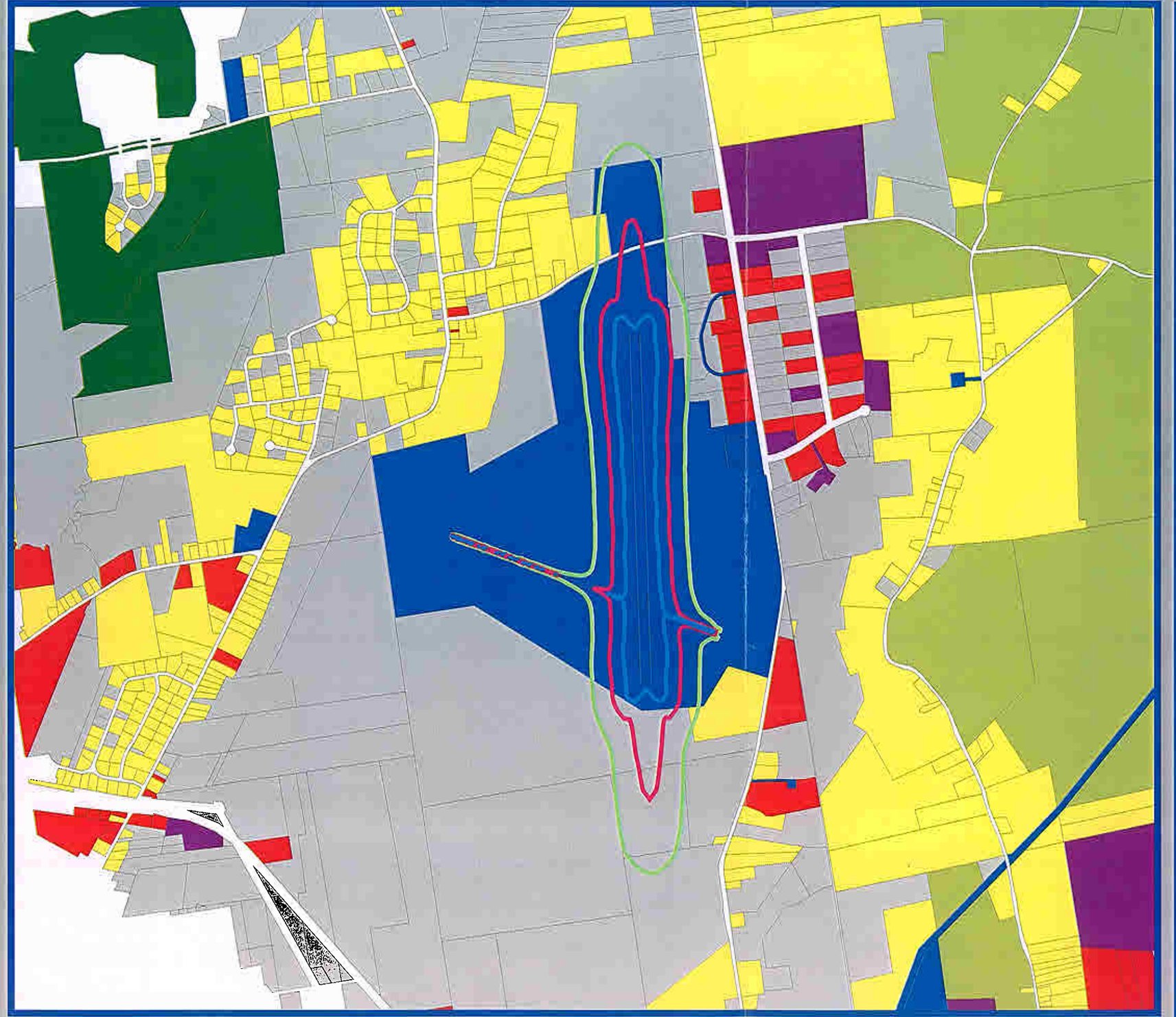
0 0.25 0.5 Miles

N

Figure 5-2

C&S COMPANIES
ENGINEERS
DESIGN BUILD
TECHNICAL RESOURCES
OPERATIONS

05/23/02 K:\WarrenCnty\projects\ground-access052302



Floyd Bennett Memorial Airport Master Plan

20 Year Forecasted Noise Contours

20 Year Contours
- 65 DNL
- 70 DNL
- 75 DNL
- Runway

Land Use
- Agricultural
- Commercial
- Industrial
- Open Space
- Public
- Residential
- Vacant Land

1" = 1,500 ft.

0 0.25 0.5 Miles

N

Figure 5-3

C&S COMPANIES
ENGINEERS
DESIGN BUILD
TECHNICAL RESOURCES
OPERATIONS

05/23/02

K:\WarrenCnty\projects\ground-access052302

5.04 Social Impacts

Social impacts that need to be considered are those associated with business or residential relocation, or other community disruption which may be caused by the operation of a facility or by development. Because Floyd Bennett Memorial Airport has sufficient property to act as buffer zones around the airfield, current operations at the airport do not involve the relocation of any residence or business, divide or disrupt established communities, disrupt orderly and planned development, alter surface transportation patterns, or create an appreciable change in employment. Potential impacts of alternatives for airport development will be discussed in Chapter 6.

5.05 Induced Socioeconomic Impacts

Induced socioeconomic impacts refer to the stimulation of residential housing construction or the institution of business or other activities which may result from the increases in use fostered by airport development. These impacts are normally site specific and will be evaluated later in this study as development at the airport is planned.

5.06 Air Quality

The Floyd Bennett Memorial Airport is located in the New York State Department of Environmental Conservation Region 5: Northern Air Quality Control region. The region generally has good ambient air quality and meets or exceeds all federal and state ambient air quality standards. The airport is located in an attainment area for all criteria pollutants.

In accordance with FAA Order 5050.4A, no air quality analysis is required if the forecasted aircraft activity at the airport is less than 180,000 operations annually. The largest forecast for the Floyd Bennett Memorial Airport for the twenty-year planning period is 60,200. This number of annual operations is 33% of the measurement point. Therefore, no further analysis is needed.

TABLE 5-1
LAND USE COMPATIBILITY WITH YEARLY DAY-NIGHT AVERAGE SOUND LEVELS IN DECIBELS

Land Use	Below 65	65-70	70-75	75-80	80-85	85
RESIDENTIAL						
Residential, other than Mobile Homes and Transient Lodgings	Y	N(1)	N(1)	N	N	N
Mobile Home Parks	Y	N	N	N	N	N
Transient Lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools, Hospitals and Nursing Homes	Y	25	30	N	N	N
Churches, Auditoriums, and Concert Halls	Y	25	30	N	N	N
Government Services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, Business and Professional	Y	Y	25	30	N	N
Wholesale and Retail-Building Materials, Hardware and Farm Equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail Trade-General	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION	Y	Y	Y(2)	Y(3)	Y(4)	N
Manufacturing-General	Y	Y	25	30	N	N
Photographic and Optical	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Agriculture (except Livestock) and Forestry Livestock Farming and Breeding	Y	Y(6)	Y(7)	N	N	N
Mining and Fishing, Resource Production Extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL	Y	Y(5)	Y(5)	N	N	N
Outdoor Sports Arenas and Spectator Sports	Y	N	N	N	N	N
Outdoor Music Shells, Amphitheater, Nature Exhibits and Zoos	Y	Y	N	N	N	N
Amusement Parks, Resorts and Camps, Golf Courses, Riding Stables and Water Recreation	Y	Y	25	30	N	N

KEY:

Y (Yes) Land use related structures compatible without restrictions.

N (No) Land use and related structures are not compatible and should be prohibited.

NLR Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into design and construction of structure.

NOTES:

1. Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide an NLR of 20 dB. Thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

2. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received; office areas, noise sensitive areas or where the normal noise level is low.

3. Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received; office areas, noise sensitive areas or where the normal level is low.

4. Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received; office areas, noise sensitive areas or where the normal noise level is low.

5. Land use compatible provided special sound reinforcement systems are installed.

6. Residential buildings require an NLR of 25.

7. Residential buildings require a NLR of 30.

8. Residential building not permitted.

Source: FAR Part 150 Airport Noise Compatibility Planning, Appendix A, U.S. Department of Transportation, Federal Aviation Administration, January 1985.

5.07 Water Quality

Floyd Bennett Memorial Airport receives its water from the Queensbury municipal water system. The Hudson-Hoosic watershed provides adequate water supply to the region. A sizable portion of airport property south and west of Runway 1-19 is Madalin silt loam (Ma). This soil has a high content of silt and clay and is poorly drained. The water table is at or near the surface year round and permeability of the soil is low. Due to the soil conditions and the presence of wetlands located around the airport the drainage of the airport property is poor.

Any proposed construction at the airport must have minimal impact on water quality. To ensure this, soil erosion and siltation controls would be used to minimize adverse water quality effects during construction as specified in Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*. In addition to this Advisory Circular, any construction would be guided by requirements of the Clean Water Act of 1972 which was designed "to establish water quality standards, control discharges into surface and subsurface waters, develop waste treatment management plans and practices, and issue permits for discharges and dredged or fill material."

5.08 Department of Transportation Act, Section 4(F)

Section 4(f) of the DOT Act places restrictions on the use of any publicly-owned recreational land, public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance.

There is no park or recreational land that is directly or indirectly affected by the airport's existing development.

5.09 Historic, Architectural, Archeological, and Cultural Resources

There are two basic laws that apply to this category of impact. The first law is the National Historic Preservation Act of 1966, as amended, which allows an Advisory Committee to recommend measures to coordinate Federal Historic preservation activities and comment on federal actions affecting properties included in or eligible for inclusion in the National Register of Historic Places. The second law is the Archeological and Historic Preservation Act of 1974, which provides for the survey, recovery, and preservation of significant archeological and historical data.

Based on consultation with the New York State Office of Parks, Recreation and Historic Preservation (OPRHP), there may be archeological sites within the airport property bounds (see Appendix F). The NYS Office of Parks, Recreation and Historic Preservation states “A Phase 1 survey is recommended before development occurs at the airport. A Phase 1 survey

is divided into two units of study including a Phase 1A sensitivity assessment and initial project area field inspection, and a Phase 1B subsurface testing program for the project area."

5.10 Biotic Communities/Endangered and Threatened Species of Flora and Fauna

Consideration of biotic communities and endangered and threatened species is required for all proposals under the Endangered Species Act as Amended. Section 7 of the Endangered Species Act as Amended requires each Federal agency to insure that any action the agency carries out "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat" of critical species.

The United States Department of the Interior (USDOI) Fish and Wildlife Service notes that "Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area."

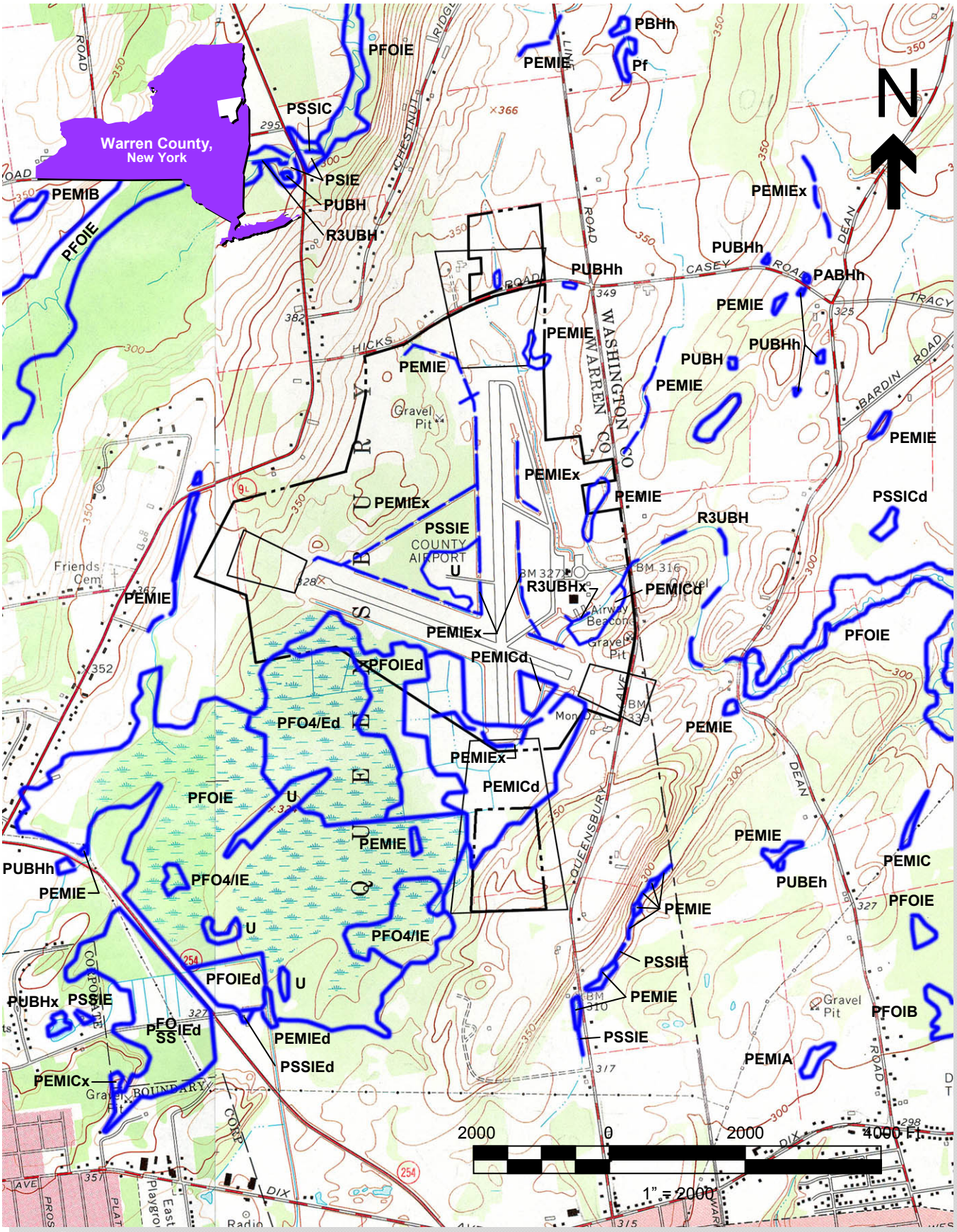
Correspondence with the NYSDEC Division of Fish, Wildlife & Marine Resources indicates that some rare species and habitats may occur in the vicinity of the airport, including Small White Ladyslipper and a Marl Fen community (see Appendix F). There will be further consultation with the NYSDEC before any development is implemented at the airport.

5.11 Wetlands

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as "those areas that are inundated by surface or ground water with a frequency sufficient to support…a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas..."

Federal and state designated wetlands, many of them overlapping, are mapped on airport property and in the area surrounding the airport (see Figures 5-4 and 5-5). There are scattered wetland areas located north and east of the airport and a large wetland area is located southwest of the airport.

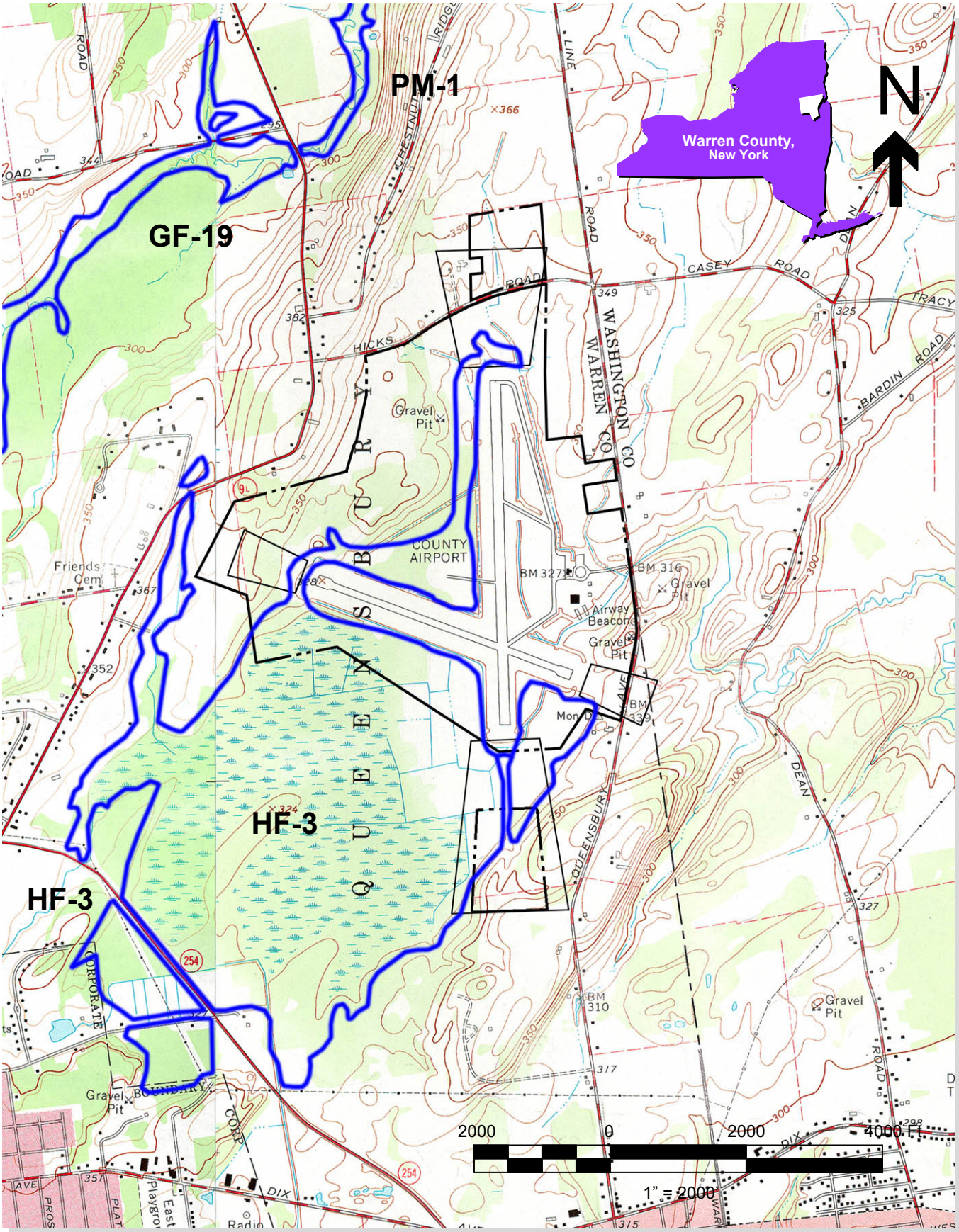
The necessary wetland permits must be acquired before any development will occur that would impact wetland areas.



Floyd Bennett Memorial Airport

National Wetlands Map

Figure 5-4



Floyd Bennett Memorial Airport

New York State Wetlands Map

Figure 5-5

5.12 Flood Plains

According to the Federal Emergency Management Agency (FEMA), flood plains are defined as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year."

The Threshold of Significance (TOS) is exceeded when there is an encroachment on a base flood plain (100-year flood). An encroachment involves:

- A considerable probability of loss of life,
- Likely future damage associated with encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facilities, or
- A notable adverse impact on natural and beneficial flood plain values.

According to the Flood Insurance Rate Map, Airport property does not encroach onto a 100 or 500-year flood plain; thus there will be no impact.

5.13 Coastal Zone Management Program

The National Oceanic and Atmospheric Administration (NOAA) Regulations contain detailed procedures for determining whether an action is consistent with approved coastal zone management programs.

The TOS is exceeded if the proposed project is in a Coastal Zone Management Program or if any of the TOS are exceeded in the following areas:

- Coastal Barriers
- Water Quality
- Biotic Communities
- Construction Impacts

According to correspondence from the New York State Division of Coastal Resources (see Appendix F), Floyd Bennett Memorial Airport is not located within a coastal zone.

5.14 Coastal Barriers

The Coastal Barriers Resources Act of 1982 prohibits most federal financial assistance for development within the Coastal Barrier Resource System which consists of undeveloped coastal barriers along the Atlantic and Gulf coasts.

Since there are no coastal barriers located on or adjacent to the airport, there would be no impact.

5.15 Wild and Scenic Rivers

The Wild and Scenic Rivers Act describes those river areas eligible to be included in a system that offers protection to rivers which "are free flowing and possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values."

According to the National Park Services, there are no wild and scenic rivers located in the immediate vicinity of the airport. The closest wild and scenic river to the Airport is the Upper Delaware River that runs along the New York/Pennsylvania border.

5.16 Prime and Unique Farmland

If a proposed project involves the acquisition of farmland that will be converted to nonagricultural use, it must be determined whether any of that land is protected by the Farmland Protection Policy Act (FPPA). The FPPA provides guidelines for identifying the effects of Federal programs on the conversion of farmland to non-agricultural uses.

There are no known protected agricultural uses in the near vicinity of the airport.

5.17 Energy Supply and Natural Resources

Potential impacts to energy requirements usually fall into two categories: those which relate to changed demands for stationary facilities (e.g., airfield lighting) and those which involve the movement of air and ground vehicles.

No development of the airport is expected to significantly change aircraft or ground vehicle use which would increase fuel consumption, or change the use of any natural resources in short supply.

5.18 Light Emissions

In order to assess the potential light emissions impacts, the extent to which any airport lighting will create an annoyance among people in the vicinity of the installation must be addressed.

Any lighting aids for Floyd Bennett Memorial Airport will be designed so that they do not shine directly into homes in the vicinity of the airport.

5.19 Solid Waste Impact

Airport actions that relate only to airfield development (e.g., runways, taxiways, and related items) will not normally result in an increase in the production of solid wastes after project completion. However, any terminal area development may involve circumstances that require consideration of solid waste impacts.

Should a new terminal or expansion of the terminal or other terminal area buildings (e.g., hangars) be planned and designed, measurements of solid waste production and disposal alternatives would have to be assessed at that time. In any case, construction debris would be disposed of at a site approved by Floyd Bennett Memorial Airport, Warren County, and the project engineer.

5.20 Construction Impacts

Limited short-term effects resulting from construction operations may occur due to proposed development. Specific effects could include noise of construction equipment on the site, noise and dust from the delivery of materials, air pollution, and water pollution from erosion.

For any future development at the airport, any impact would be controlled and limited by requiring the contractor to comply with all contract provisions for environmental protection. These short-term construction impacts will not persist beyond the construction period, and no significant long-term construction impacts are expected as a result of development at the airport. All construction activities would take place in accordance with Advisory Circular 150/5370 -10A, *Standards for Specifying Construction of Airports*.

5.21 Environmental Justice

Executive Order 12898 (February 11, 1994) was issued to address Environmental Justice in Minority Populations and Low-Income Populations. The intent of this Order is to ensure that each federal agency shall conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that does not exclude persons or populations from participation, does not deny benefits, and does not subject to discrimination because of race, color, or national origin. Ensuring greater public participation and access to information by minority and low-income populations is part of the environmental justice strategy.

No discrimination based on minority status, age or low income will result with implementation of any proposed project and opportunities will be offered for receiving public comments. Thus, any proposed action as a result of this master plan is not expected to have a significant adverse impact in this category.

5.22 Impacts to Children

Executive Order 13045 (April 21, 1997) requires federal agencies to ensure that their policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks. Federal agencies must identify and assess potential environmental health risks to children. Potential environmental health risks are defined to mean risks to health that are attributable to products or substances that the child is likely to come in contact with or ingest, such as air, food, water, soil, and products.

No concerns have been raised to date concerning potential environmental health risks to children in the area of the Floyd Bennett Memorial Airport. The airport is primarily surrounded by commercial business west of the airport and open space north, south and east of the airfield. Therefore, disproportionate risks or impact by the airport on schools, playgrounds, and any other areas where children may frequent are not likely. Please refer to air, noise and water quality sections for additional information.

5.23 Secondary, Indirect and Cumulative Impacts

The Council of Environmental Quality regulations (40 CFR ~§ 4321 et seq.) require that secondary (or indirect) consequences be included as part of the environmental review process.

There are no secondary or indirect effects by the proposed airport development that is reasonably foreseeable.

As stated in (40 CFR § 1508.7), cumulative impacts are effects "on the environment, which result from incremental impact of the action when added to other past, present and reasonably foreseeable future actions." It states furthermore that, "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." Impact could occur from concurrent construction of projects in a localized area.

There are no cumulative environmental impacts expected from proposed development at the airport. The phased development at the airport will take into account other planned projects, such as the rehabilitation of Queensbury Avenue, in order to coordinate construction activities and minimize impacts.

An Environmental Assessment will be performed at the airport before development occurs in order to prevent, reduce and properly mitigate any impacts to the environment.

5.24 Summary

Based on this environmental review and considering future development options for the airport, the following categories may need special attention:

- Wetlands, and
- Endangered Species and Threatened Flora and Fauna,
- Historic, Architectural, Archeological and Cultural Resources.

Appropriate measures, including site surveys would be undertaken as required before any proposed development takes place.

In addition, airport development may create short-term impacts in these additional categories:

- Air Quality,
- Water Quality, and
- Construction Impacts.

In each case, construction activities that would create impacts will take place in accordance with Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*, and all appropriate mitigation measures will be taken.

Based on the existing environmental setting at the airport and FAA guidelines, there are no adverse impacts to the environment expected in the following categories:

- Noise,
- Compatible Land Use,
- Social Impacts,
- Induced Socioeconomic Impacts,
- DOT 4(f) Land (Parkland),
- Biotic Communities,
- Flood Plains,
- Coastal Zone Management Program,
- Coastal Barriers,
- Wild and Scenic Rivers,
- Prime and Unique Farmland,
- Energy Supply and Natural Resources,
- Light Emissions,
- Solid Waste Impact,
- Environmental Justice,
- Impacts to Children, and
- Cumulative Impacts.

Chapter 6 – Alternatives of Airport Development

6.01 General

This chapter deals with the description and evaluation of alternative plans for proposed development at Floyd Bennett Memorial Airport. The purpose of this analysis is to develop a comprehensive plan of airport facilities that can realistically accommodate the airport demands. The master planning process is one of defining the facility requirements of the airport to handle the forecast demand. After facility requirements have been determined, a series of alternative solutions to satisfy them must be identified and tested.

The alternative plans will undergo a comparative evaluation process consisting of qualitative and quantitative factors. Ideally, the evaluation process would express all factors involved in terms of a common quantitative measure, such as dollar value. Because of the difficulties inherent in expressing certain factors in quantifiable terms, the evaluation process must rely on the use of both quantitative and qualitative factors.

The factors considered are grouped in five basic categories as follows:

- Airport Design Standards;
- Environmental Impacts;
- Development Costs;
- Facility Requirements; and
- Implementation Feasibility.

Five individual plans were prepared during the evaluation phase to depict future development alternatives. Although they do not exhaust all the variations which may be applied, the alternatives form an appropriate base to produce a "preferred" plan of development for the airport. In most cases, the preferred alternative will be a blend of projects taken from different alternatives, with the more favorable points of each selected for presentation on the Airport Layout Plan.

6.02 Description of Alternative Plans

Five improvement options were selected for evaluation to assess the advantages and disadvantages of each. These options were developed as a result of meetings and discussions with the Airport Advisory Committee and the Airport Manager. This subsection describes the five plans of alternative development. It should be noted that this analysis focuses on options of both airside and landside development. The alternative plans are as follows:

Alternative 1 - No-Build:

This plan represents a scenario where the airport is not developed at all. (See Figure 6-1).

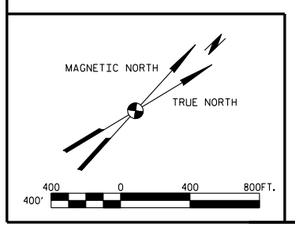
Alternative 2:

This alternative is depicted in Figure 6-2 and involves the following:

- A 1,000-foot extension to Runway 1 and associated taxiway.
  - Phase I-500 feet
  - Phase II-500 feet
  - Relocated MALSR and glideslope
- Taxiway access from Runway 19 to the proposed Industrial/Hangar park.
- Parallel Taxiway on Runway 12-30.
- An 8,000 square yard apron to be constructed north of the auto parking lot.
- Existing FBO hangar to be refurbished.
- New FBO hangar to be constructed north of the existing FBO hangar at a later phase.
- New Maintenance building east of the existing FBO hangar.
  - Includes sand storage facilities
- Construction of 28 T-hangar bays.
  - Two 10-bay T-hangars on the based aircraft apron.
  - One 6-bay adjacent to the other 6-bay T-hangars.
  - Based aircraft parking lot will be relocated.
  - Addition of 2 bays to the 6-bay T-hangar that is located north of the airfield.
- Sites for future apron/hangar development are located along along Taxiway A and shown on the plan.
- Runway safety areas will be evaluated and reconstructed to standard requirements as necessary.

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH LENGTH	500' 7,000'	150' 4,600'
ROFA	WIDTH LENGTH	800' 7,000'	500' 4,600'
TSA	WIDTH	118'	118'
TOFA	WIDTH	186'	186'

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGAR (2-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE SHOP
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	SAND STORAGE



LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA

REVISIONS		
BY	DATE	CHANGE

FIGURE 6-1

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

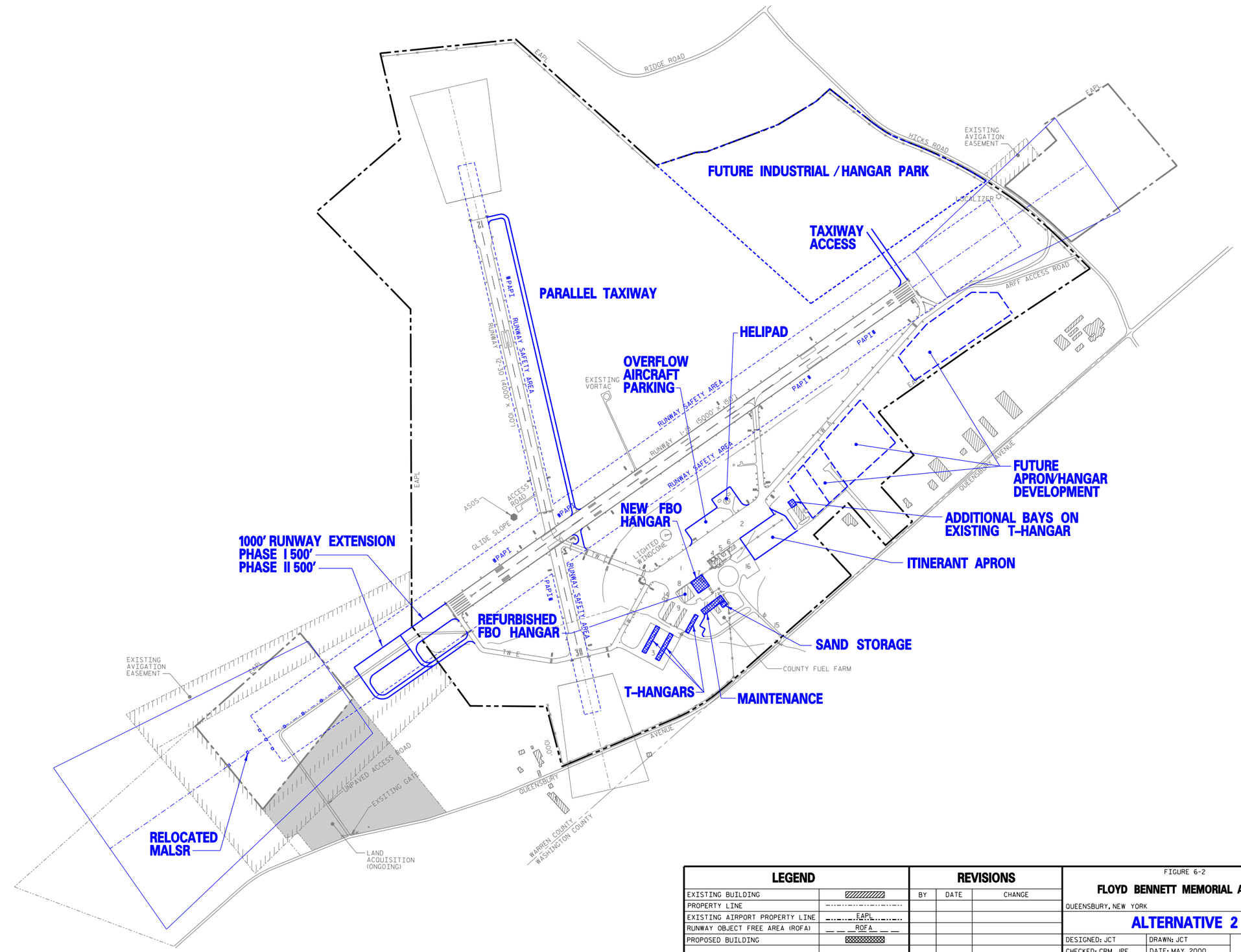
ALTERNATIVE 1 (NO BUILD)

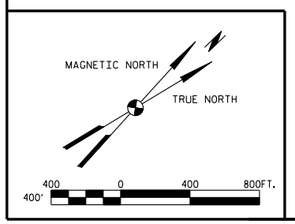
DESIGNED: JCT	DRAWN: JCT	SHEET 1 OF 5
CHECKED: CRM, JPE	DATE: MAY 2000	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP06.DGN	

CS

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH LENGTH	500' 7,000'	150' 4,600'
ROFA	WIDTH LENGTH	800' 7,000'	500' 4,600'
TSA	WIDTH	118'	118'
TOFA	WIDTH	186'	186'

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGAR (2-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE SHOP
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	SAND STORAGE





LEGEND	
EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
PROPOSED BUILDING	

REVISIONS		
BY	DATE	CHANGE

FIGURE 6-2

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

ALTERNATIVE 2

DESIGNED: JCT	DRAWN: JCT	SHEET 2 OF 5
CHECKED: CRM, JPE	DATE: MAY 2000	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: I629AP06.DGN	

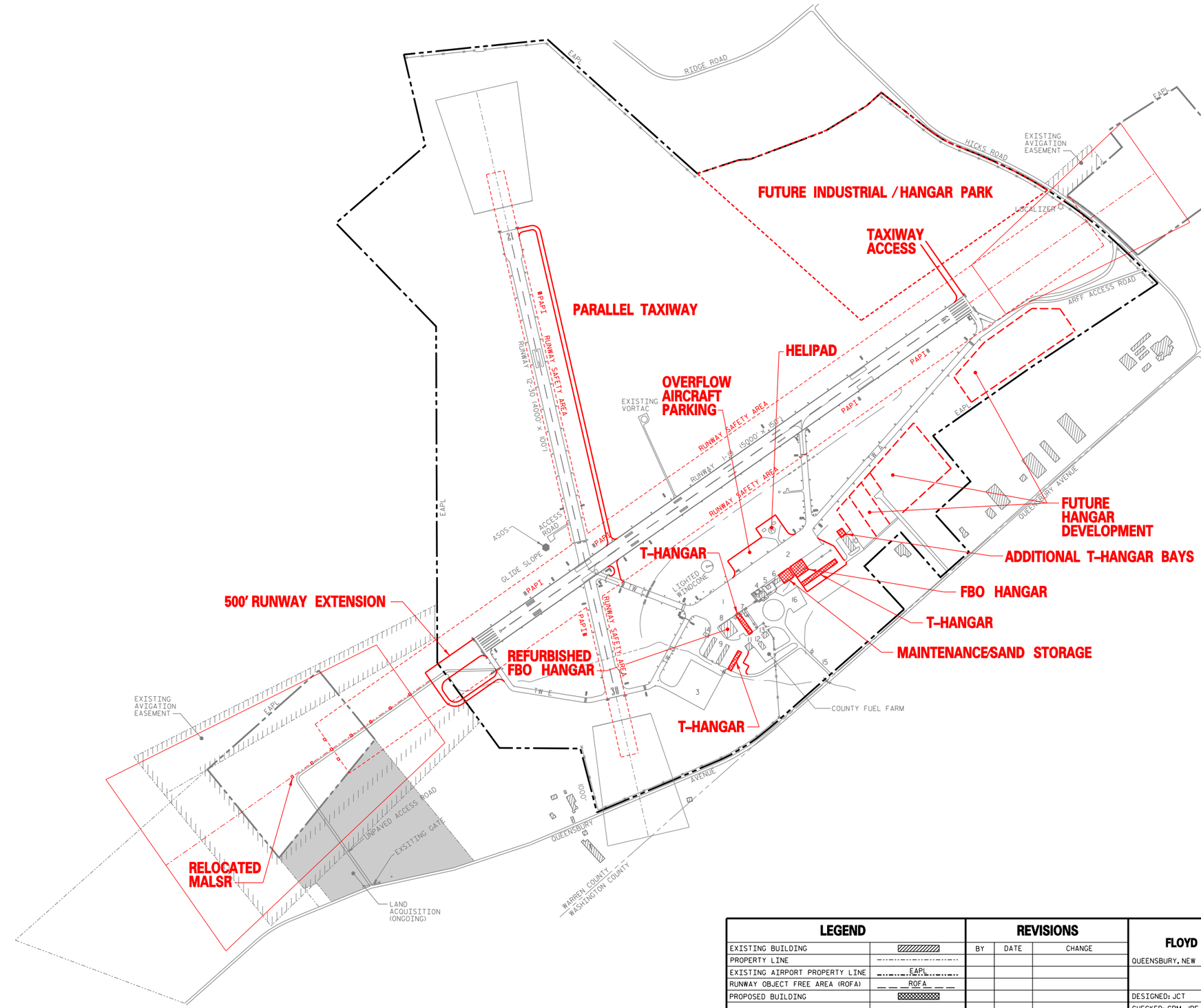
Alternative 3:

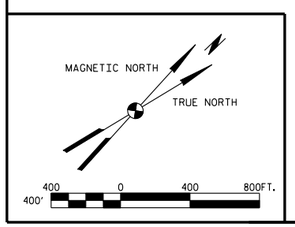
This alternative is depicted in Figure 6-3 and involves the following:

- A 500-foot extension to Runway 1 and associated taxiway.
    - Relocated MALSR and glideslope
- Taxiway access from Runway 19 to the proposed Industrial/Hangar park.
- Parallel Taxiway on Runway 12-30.
- A 20,000 square yard itinerant aircraft parking apron/helipad will be constructed west of the terminal.
- Existing FBO hangar to be refurbished.
- New Maintenance building added to the existing ARFF building.
    - Includes sand storage facilities.
- New FBO hangar to be constructed north of the maintenance building at a later phase.
- Construction of 28 T-hangar bays.
    - A 10-bay T-hangar constructed north of the existing FBO hangar.
    - A 10-bay T-hangar constructed east of the new FBO hangar.
    - One 6-bay adjacent to the other 6-bay T-hangars.
    - Based aircraft parking lot will be relocated.
    - Addition of 2 bays to the 6-bay T-hangar that is located north of the airfield.
- Sites for future apron/hangar development are located along along Taxiway A and shown on the plan.
- Runway safety areas will be evaluated and reconstructed to standard requirements as necessary.

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH LENGTH	500' 7,000'	150' 4,600'
ROFA	WIDTH LENGTH	800' 7,000'	500' 4,600'
TSA	WIDTH	118'	118'
TOFA	WIDTH	186'	186'

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGAR (2-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE SHOP
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	SAND STORAGE





LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EARL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
PROPOSED BUILDING	

REVISIONS		
BY	DATE	CHANGE

FIGURE 6-3

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

ALTERNATIVE 3

DESIGNED: JCT	DRAWN: JCT	SHEET 3 OF 5
CHECKED: CRM, JPE	DATE: MAY 2000	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP06.DGN	

CS CONSULTANTS

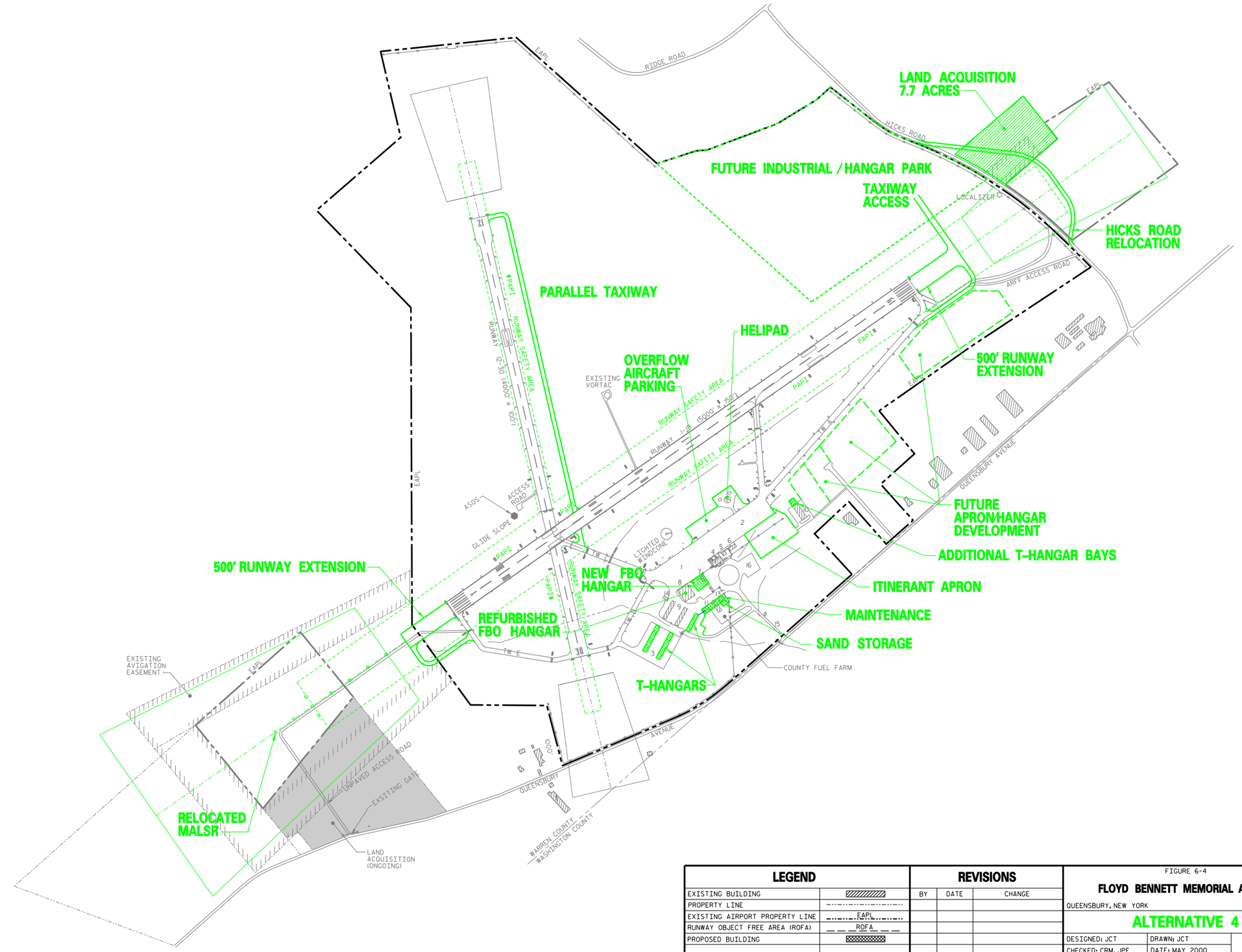
Alternative 4:

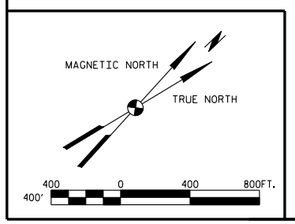
This alternative is depicted in Figure 6-4 and involves the following:

- A 1,000-foot extension to Runway 1-19 and associated taxiways.
  - Phase I-500-foot extension to Runway 1 and associated taxiway.
  - Relocated MALSR and glideslope
  - Phase II-500-foot extension to Runway 19 and associated taxiway.
  - Hicks Road relocation to accommodate the Runway 19 extension.
  - Approximately 7.7 acres of land acquisition for the Hicks Road Right of Way to be included on airport property.
- Taxiway access from Runway 19 to the proposed Industrial/Hangar park.
- Parallel Taxiway on Runway 12-30.
- An 8,000 square yard apron to be constructed north of the auto parking lot.
- Existing FBO hangar to be refurbished.
- New FBO hangar to be constructed north of the existing FBO hangar at a later phase.
- New Maintenance building east of the existing FBO hangar.
  - Includes sand storage facilities
- Construction of 28 T-hangar bays.
  - Two 10-bay T-hangars on the based aircraft apron.
  - One 6-bay adjacent to the other 6-bay T-hangars.
  - Based aircraft parking lot will be relocated.
  - Addition of 2 bays to the 6-bay T-hangar that is located north of the airfield.
- Sites for future apron/hangar development are located along along Taxiway A and shown on the plan.
- Runway safety areas will be evaluated and reconstructed to standard requirements as necessary.

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH LENGTH	500' 7,000'	150' 4,600'
ROFA	WIDTH LENGTH	800' 7,000'	500' 4,600'
TSA	WIDTH	118'	118'
TOFA	WIDTH	186'	186'

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGAR (2-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE SHOP
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	SAND STORAGE





LEGEND	
EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
PROPOSED BUILDING	

REVISIONS		
BY	DATE	CHANGE

FIGURE 6-4

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

ALTERNATIVE 4

DESIGNED: JCT	DRAWN: JCT	SHEET 4 OF 5
CHECKED: CRM, JPE	DATE: MAY 2000	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: I629AP06.DGN	

C S

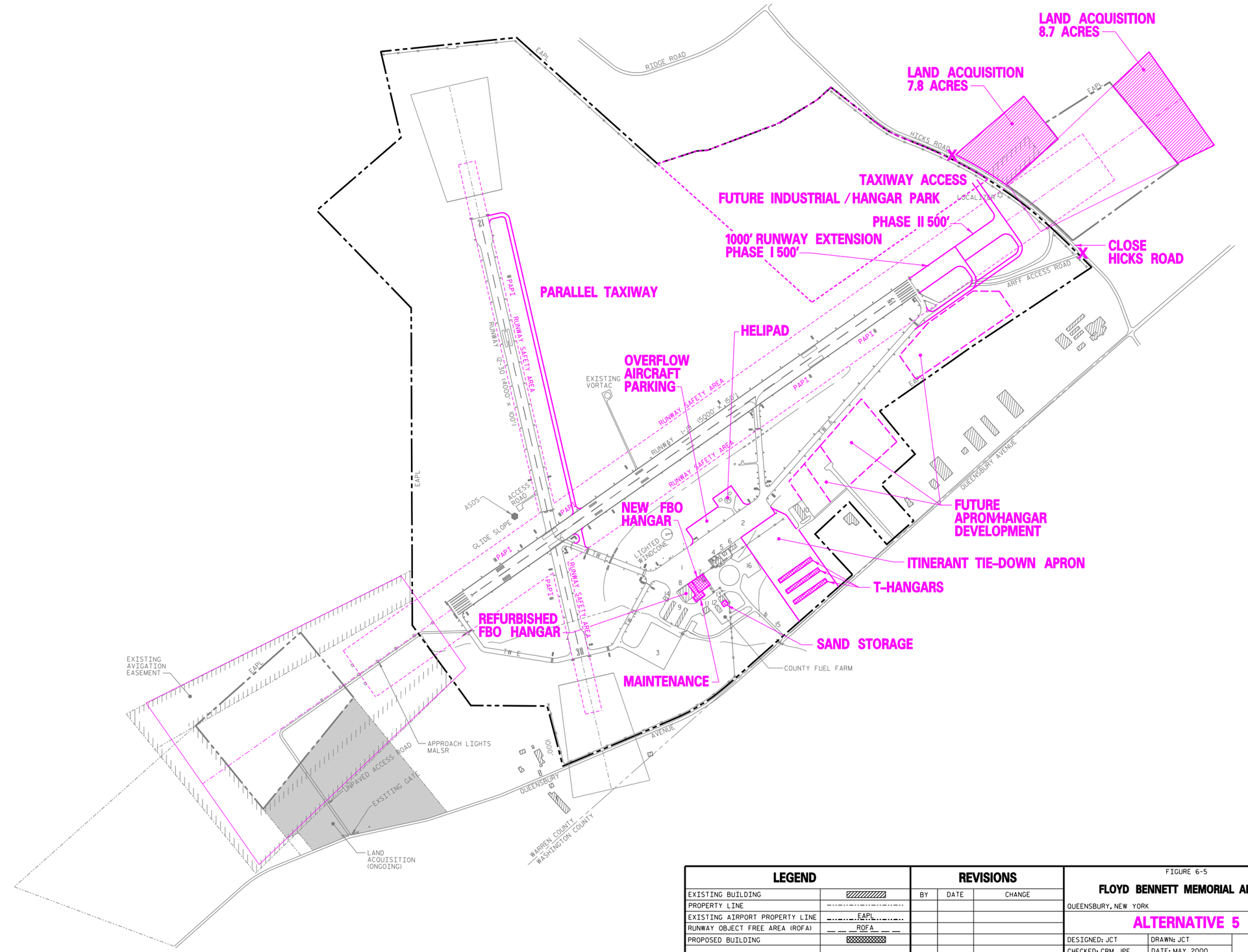
Alternative 5:

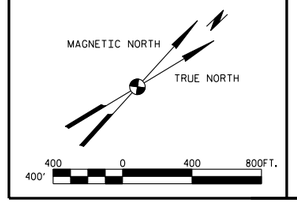
This alternative is depicted in Figure 6-5 and involves the following:

- A 1,000-foot extension to Runway 19 and associated taxiway.
  - Phase I-500-foot extension to Runway 19 and associated taxiway.
  - Phase II-500-foot extension to Runway 19 and associated taxiway.
  - Hicks Road closed to accommodate the Runway 19 extension.
  - Approximately 17 acres of land acquisition for the Hicks Road Right of Way to be included on airport property and for control of the area in the Runway Protection Zone.
- Taxiway access from Runway 19 to the proposed Industrial/Hangar park.
- Parallel Taxiway on Runway 12-30.
- A 45,000 square yard itinerant tie-down and hangar apron to be constructed north of the auto parking lot.
- Existing FBO hangar to be refurbished.
- New Maintenance building north of the existing FBO hangar.
- New FBO hangar to be constructed north of the existing FBO hangar at a later phase.
- Construction of 30 T-hangar bays.
  - Three 10-bay T-hangars on the new aircraft apron located north of the auto parking.
- Sites for future apron/hangar development are located along along Taxiway A and shown on the plan.
- Runway safety areas will be evaluated and reconstructed to standard requirements as necessary.

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH LENGTH	500' 7,000'	150' 4,600'
ROFA	WIDTH LENGTH	800' 7,000'	500' 4,600'
TSA	WIDTH	118'	118'
TOFA	WIDTH	186'	186'

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGAR (2-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE SHOP
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	SAND STORAGE





LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
PROPOSED BUILDING	

REVISIONS

BY	DATE	CHANGE

FIGURE 6-5

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

ALTERNATIVE 5

DESIGNED: JCT	DRAWN: JCT	SHEET 5 OF 5
CHECKED: CRM, JPE	DATE: MAY 2000	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: I629AP06.DGN	

CS COMPANIES

6.03 Evaluation Criteria

Evaluation criteria were developed to determine which of the airside and landside development alternatives would best meet Floyd Bennett Memorial Airport's requirements for the year 2020. These criteria are discussed in the following sections.

6.03-1 Airport Design Standards

First the alternatives were rated on their ability to meet the FAA airport design standards and to continue to provide for safe operation of aircraft at the airport. These standards are design criteria involving widths, gradients, separations of runways, taxiways, and other features of the landing area that must necessarily incorporate wide variations in aircraft performance, pilot technique, and weather conditions. The FAA design standards provide for uniformity of airport facilities and serve as a guide to aircraft manufacturers and operators with regard to the facilities which may be expected to be available in the future. Examples of improvements based on airport design standards would include the removal of an obstruction to air navigation, the grading of a runway safety area, or the addition of a parallel taxiway (to improve the aircraft traffic flow, limiting the time an aircraft must spend on the runway, both before takeoff and after landing).

The alternative plans for Floyd Bennett Memorial Airport are based in general on design standards, contained in FAA AC 150/5300-13, for an Airport Reference Code (ARC) D-II airport. (Aircraft Approach Category D includes aircraft with a speed of 141 knots or more but less than 161 knots. Airplane Design Group II includes airplanes with a wingspan up to but not including 79 feet.) These design standards will apply in particular for Runway 1-19.

For Runway 12-30, an ARC of B-II has been established Aircraft usage only by Aircraft Approach Category B (including aircraft with a speed of 91 knots or more but less than 121 knots) and Airplane Design Group II (wingspan up to but not including 79 feet) is anticipated. The major design standards used are shown in Table 6-1.

TABLE 6-1
DESIGN STANDARDS

Item	Recommended Distance or Dimension Runway 1-19	Recommended Distance or Dimension Runways 12-30
Runway Centerline to		
- Taxiway Centerline	300 feet	240 feet
- Aircraft Parking Area	400 feet	250 feet
Runway Width	100 feet	75 feet
Runway Safety Area		
- Width	500 feet	150 feet
- Length (Beyond Runway End)	1000 feet	300 feet
Runway Object Free Area		
- Width	800 feet	500 feet
- Length (Beyond Runway End)	1000 feet	300 feet
Taxiway Width	35 feet	35 feet
Taxiway Safety Area Width	79 feet	79 feet
Taxiway Object Free Area Width	131 feet	131 feet

Source: C&S Engineers, Inc., and Federal Aviation Administration Advisory Circular 150/5300-13

6.03-2 Environmental Impacts

This criterion was used to rate alternatives on how they would affect the airport environment and the airport community. An environmental review of the possible impacts associated with each of the alternatives was undertaken as part of the rating process. This review included assessing how the environment could be affected by the proposed development, and to what degree (e.g., acres of wetlands impacts).

6.03-3 Development Costs

This criterion was used to rate each of the alternatives based on probable development cost.

6.03-4 Facility Requirements

This criterion was used to rate alternatives based on ability to satisfy the facility requirements identified in Chapter 4. Facility requirements are developed from an analysis of the demand and capacity requirements, and from geometric and other standards governing the design of airport components. Specific projects required to meet existing and future demand at the airport include:

- Additional Runway Length
- Full Parallel and Access Taxiways
- Runway and Taxiway Edge Lighting, and
- Aircraft Storage Hangars.

6.03-5 Implementation Feasibility

This criterion answers the question: What is the likelihood that this alternative will be implemented? The preferred development alternative must have the ability to be implemented through logical phases that meet the airport's increasing requirements to the year 2020. Therefore, each alternative was rated on its feasibility for implementation, considering both quantitative and qualitative factors. These include factors such as the urgency of the need to address deficiencies and safety concerns, the degree of environmental impacts, community receptiveness, feasibility of needed land acquisition, and the sponsor's willingness to bear the development cost (along with the FAA and NYSDOT).

6.04 Evaluation of Alternatives

Each alternative was evaluated based on the five criteria discussed previously: airport design standards, environmental impacts, development costs, facility requirements, and implementation feasibility. An evaluation matrix (Table 6-4) uses a scale of 1 to 5, with 1 being poor and 5 being best, to rate each alternative for its ability to satisfy each criterion. The alternative ratings are then totaled.

This system allows each alternative to be judged on the whole and on each individual criterion. By totaling individual ratings for each of the evaluation criteria, the alternatives can be ranked in order of preference. The following sections provide a discussion of the evaluation of the alternatives based on the specified criteria.

6.04-1 Airport Design Standards

Alternative 1:

This alternative receives a rating of 2 for airport design standards. With one exception, the existing airport meets or exceeds FAA recommended design standards. There are problems with the grade of the Runway 19 safety area and a drainage ditch that runs through the Runway 1 safety area. The problems with the safety area design hamper the safety of operations at the Airport.

Alternative 2:

This alternative will meet all FAA design standards and receives a rating of 5.

Alternative 3:

This alternative will meet all FAA design standards and receives a rating of 5.

Alternative 4:

This alternative will meet all FAA design standards and receives a rating of 5.

Alternative 5:

This alternative will meet all FAA design standards and receives a rating of 5.

6.04-2 Environmental Impacts

The potential environmental impacts that are addressed for each alternative are listed below:

Noise
Compatible Land Use
Social Impacts
Induced Socioeconomic Impacts
Air Quality
Water Quality
DOT Act, Section 4(f)
Historic, Architectural, Arch-ecological & Cultural Resources
Biotic Communities/Endangered & Threatened Species
Wetlands
Flood Plains
Coastal Zone Management
Coastal Barriers
Wild & Scenic Rivers
Prime & Unique Farmland
Energy Supply & Natural Resources
Light Emissions
Solid Waste
Construction Impacts
Environmental Justice
Impacts to Children
Cumulative Impacts

The alternatives were analyzed for their impact in each of the 22 categories. (For preliminary environmental review, see Chapter 5). Specific impacts for each alternative are discussed below:

Alternative 1:

There are no impacts to the environment since no airport development would occur. Since there are no adverse effects on the environment this alternative receives a rating of 5.

Alternative 2:

Alternative 2 receives a 3 based on the following:

1) Biotic Communities/Endangered and Threatened Species – The NYSDEC Division of Fish, Wildlife & Marine Resources indicates the possible presence of the Small White Ladyslipper, which is an endangered plant, and the presence of a Marl Fen Community south and west of Runway 1. The 1,000-foot extension of Runway 1 may encroach upon habitat for the Small White Ladyslipper or into a Marl Fen Community. According to the USDOI Fish and Wildlife Service, except for occasional transient individuals, no Federally listed or proposed endangered or threatened species are known to exist in the project impact areas.

2) Wetlands – The Runway 1 extension is expected to impact wetland areas.

3) Construction - There would be construction impacts due to earth movement, equipment noise, and some soil erosion.

Alternative 3:

Alternative 3 receives a 3 based on the following:

1) Biotic Communities/Endangered and Threatened Species – The NYSDEC Division of Fish, Wildlife & Marine Resources indicates the possible presence of the Small White Ladyslipper, which is an endangered plant, and the presence of a Marl Fen Community south and west of Runway 1. The 500-foot extension of Runway 1 may encroach upon habitat for the Small White Ladyslipper or into a Marl Fen Community. According to the USDOI Fish and Wildlife Service, except for occasional transient individuals, no Federally listed or proposed endangered or threatened species are known to exist in the project impact areas.

2) Wetlands – The Runway 1 extension is expected to impact wetland areas.

3) Construction - There would be construction impacts due to earth movement, equipment noise, and some soil erosion.

Alternative 4:

Alternative 4 receives a 2 based on the following:

1) Biotic Communities/Endangered and Threatened Species – The NYSDEC Division of Fish, Wildlife & Marine Resources indicates the possible presence of the Small White Ladyslipper, which is an endangered plant, and the presence of a Marl Fen Community south and west of Runway 1. The 500-foot extension of Runway 1 may encroach upon habitat for the Small White Ladyslipper or into a Marl Fen Community.

According to the USDOI Fish and Wildlife Service, except for occasional transient individuals, no Federally listed or proposed endangered or threatened species are known to exist in the project impact areas.

2) Social Impacts – The 500-foot extension to Runway 19 would require Hicks Road to be relocated. The road relocation would displace one residence because of the land acquisition required.

3) Wetlands – The Runway 1-19 extension is expected to impact wetland areas.

4) Construction - There would be construction impacts due to earth movement, equipment noise, and some soil erosion.

Alternative 5:

Alternative 5 receives a 1 based on the following:

1) Social Impacts – The closing of a section of Hicks Road may divide or disrupt established communities and would alter surface transportation patterns for local residents to the west and north of the airport. Residential land parcels would need to be acquired in order to construct the extension.

2) Wetlands – The Runway 19 extension is expected to impact wetland areas.

3) Construction - There would be construction impacts due to earth movement, equipment noise, and some soil erosion.

Air quality, water quality, and construction impacts resulting from airport development for Alternatives 2, 3, 4, or 5 would be short-term. Significant land use compatibility or noise impacts are not anticipated for any of the five alternatives since changes in fleet mix and numbers of aircraft operations are projected to be moderate. However, an extension of Runway 19 could affect residential areas to the north of the airport to a greater degree.

Based on the above analysis, Alternative 1 received a rating of 5 since this no-build alternative will have no adverse environmental impacts. Alternative 2 was rated 3 based on the potential impacts associated with wetlands and endangered species. Alternative 3 received a rating of 3 because it may have wetlands and endangered species impacts. Alternative 4 was rated 2 because it involves relocation of a road and may have wetlands and endangered species impacts. Alternative 5 received a rating of 1 because impacts to wetlands are anticipated and the road closure may cause social impacts.

6.04-3 Development Costs

Current unit construction cost estimates for major airside and landside development work was prepared. This consisted of preparation of an opinion of probable costs based upon the consultant's knowledge of contractors and construction material suppliers. The major work items selected for this purpose are presented in Table 6-2 with associated probable unit costs.

The objective of quantifying unit construction costs was to obtain an approximate cost of each alternative plan. In order to accomplish this in a practical manner, major cost items associated with airside and landside improvements were included in the computations. An average cost for acres of land acquisition, whether by fee simple or easement, has been used for comparison purposes among the development alternatives. The construction costs shown for each plan are not to be considered the final total cost of each plan, but are meant to provide a means of comparison.

TABLE 6-2
UNIT COSTS FOR AIRPORT DEVELOPMENT

Item	Unit	Unit Cost
Earthwork	Cubic Yard	$8
Runway Construction	Square Yard	$180
Apron Construction	Square Yard	$54
Road Construction	Square Yard	$115
Taxiway Construction	Square Yard	$72
Refurbish FBO Hangar	Square Feet	$15
FBO Hangar Construction	Square Feet	$110
10 Bay Maintenance Building	Square Feet	$52
T-Hangar	Per Bay	$35,000
Relocation of Navigational Aids	MALSR-Glideslope	$400,000
Land Acquisition (Fee Simple/Easement)	Per Acre	$5,000
Obstruction Removal	Per Acre	$6,000

Source: C&S Engineers, Inc.

Table 6-3 presents a comparison of the costs associated with each of the alternatives. There is no cost associated with the no-build Alternative 1; thus, it receives a rating of 5. Due to new apron/hangar development and the proposed road closing for the runway extension, Alternative 5 is the most costly at $10.8 million and receives a rating of 1. Alternative 4 costs approximately $1.5 million less than Alternative 5 and receives a rating of 2. Alternative 3, with an estimated cost of $9 million, is rated as a 3. Alternative 2, the least expensive development alternative is projected to cost $8.4 million and receives a rating of 4.

TABLE 6-3
FLOYD BENNETT AIRPORT
OPINION OF PROBABLE DEVELOPMENT COSTS
(2001 DOLLARS)

	ALTERNATIVES				
Item	**1**	**2**	**3**	**4**	**5**
Wetland Mitigation	$0	$650,000	$585,000	$827,500	$242,500
Earthwork	$0	$450,000	$400,000	$800,000	$440,000
Runway Construction	$0	$1,500,000	$750,000	$1,500,000	$1,500,000
Relocation of NavAids	$0	$400,000	$250,000	$250,000	$0
Road Construction	$0	$0	$0	$720,000	$250,000
Apron Construction	$0	$550,000	$1,850,000	$550,000	$3,000,000
T-Hangar	$0	$980,000	$1,230,000	$980,000	$1,050,000
Refurbish Existing Hangar	$0	$200,000	$200,000	$200,000	$200,000
Construct new Hangar	$0	$1,500,000	$1,500,000	$1,500,000	$1,500,000
10 Bay Maintenance	$0	$900,000	$900,000	$900,000	$900,000
Taxiway Construction	$0	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Land Acquisition	$0	$0	$0	$50,000	$110,000
Obstruction Removal	$0	$450,000	$450,000	$400,000	$400,000
TOTAL:	$0	$8,430,000	$9,030,000	$9,350,000	$10,850,000

Source: C&S Engineers, Inc.

6.04-4 Facility Requirements

Alternative 1:

This alternative would not meet the airport's immediate and long-term requirements. The existing deficiencies of the airfield would not be addressed, therefore alternative 1 is rated a 1.

Alternative 2:

This alternative would meet all of the airport's immediate and long-term facility requirements (as discussed in Chapter 4); in addition, it would correct existing deficiencies and allow for future development. Alternative 2 receives a 5 for facility requirements.

Alternative 3:

This alternative would meet all of the airport's immediate and long-term facility requirements (as discussed in Chapter 4); in addition, it would correct existing deficiencies and allow for future development. However, a 500-foot runway extension does not allow the airport to maintain an adequate runway length for aircraft expected to utilize the airport within the forecast period, therefore alternative 3 receives a 4.

Alternative 4:

This alternative would meet all of the airport's immediate facility requirements (as discussed in Chapter 4). In addition, it would correct existing deficiencies and allow for future development. Alternative 4 receives a 5 for facility requirements.

Alternative 5:

This alternative would meet all of the airport's immediate and long-term facility requirements (as discussed in Chapter 4). In addition, it would correct existing deficiencies and allow for future development. Alternative 5 receives a 5 for facility requirements.

Alternative 3 includes a 500-foot runway extension, providing a 5,500-foot runway length, adequate for most regional jets. For Alternatives 2, 4 and 5, a 1,000-foot runway extension is shown to demonstrate how the airport site could accommodate this length in the future.

Based on the facility requirements criterion, Alternative 1 was rated 1, Alternative 2 was rated 5, and Alternative 3 was rated 4. Alternative 4 received a rating of 5 and Alternative 5 was rated 5.

6.04-5 Implementation Feasibility

The last evaluation criterion was the implementation feasibility of the alternatives. Considering both quantitative and qualitative factors, this criterion answers the question: What is the likelihood that this alternative will be implemented?

Alternative 1:

This alternative received a rating of 1 because, although no implementation would be involved, taking no action would allow existing deficiencies and violations of FAA standards discussed in Section 6.04-1 to go uncorrected.

Alternative 2:

Alternative 2 does not involve any land acquisition to extend Runway 1. In addition, Hicks Road, a well-traveled local road, would not have to be closed or relocated. The runway extension creates a potential for impacts to wetlands, biotic communities, and endangered species exists with this alternative. However, this alternative has the lowest estimated cost of all the development alternatives, while also providing a 6,000-foot runway length. Therefore, feasibility of implementation was rated 4 for Alternative 2.

Alternative 3:

Alternative 3 received a rating of 4 for feasibility of implementation. Similar to Alternative 2, the Runway 1 extension of 500-feet would not involve any land acquisition. The 500-foot extension to Runway 1 creates potential for impacts to wetlands, biotic communities, and endangered species, although presumably lesser impacts than Alternative 2. However, the location of T-hangars does not take advantage of locations in which the site work has already

been completed and a 500-foot extension does not take advantage of the airport's full development potential. The projected cost of Alternative 3 is approximately $700,000 more than Alternative 2.

Alternative 4:

This alternative received a rating of 3 for feasibility of implementation. In addition to the impacts to wetlands, biotic communities, and endangered species that exist with extending Runway 1, Hicks Road would need to be relocated to extend Runway 19. Approximately 7.5 acres of land acquisition would be necessary to accommodate the runway extension and the road relocation. The cost projected for Alternative 4 is approximately $500,000 more than that for Alternative 3.

Alternative 5:

Alternative 5 received a rating of 2 for feasibility of implementation. Extending Runway 19 for 1000 feet would require the closing of Hicks Road, a well traveled local road. The road closing would disrupt and divide existing communities and alter surface transportation patterns. Approximately 17 acres would need to be acquired to accommodate this extension. The potential impacts to wetlands, biotic communities, and endangered species that exist with this alternative would be less than for Alternatives 2, 3 and 4. However, Alternative 5 is the most expensive, at a projected cost of $11.1 million.

6.04-6 Evaluation Summary

The evaluation of the five alternatives is summarized in Table 6-4. After totaling the individual ratings, the alternatives are ranked in order of preference.

TABLE 6-4
ALTERNATIVE RATINGS

	ALTERNATIVES				
Evaluation Criteria	**1**	**2**	**3**	**4**	**5**
Airport Design Standards	2	5	5	5	5
Environmental Impacts	5	3	3	2	1
Development Cost	5	4	3	2	1
Facility Requirements	1	5	4	5	5
Implementation Feasibility	1	4	4	3	2
TOTAL	**14**	**21**	**19**	**17**	**14**
RANK	**5th**	**1st**	**2nd**	**3rd**	**4th**

Source: C&S Engineers, Inc.

Of the five alternatives, Alternatives 1 and 5 received the lowest ratings overall based on the five evaluation criteria. Cost and social impacts (related to the road closure) were the main reasons for the low ratings. Alternative 1, the "no-build" alternative avoids the environmental impacts and cost of development; however, the "no-build" alternative does not meet facility requirements or enhance the safety of the airport. Alternative 4, rated third lowest, involves a costly road relocation.

Alternatives 2 and 3 have similar impacts associated with the Runway 1 extension. These alternatives meet most FAA airport design standards and facility requirements, and enhance the safety of the airport. Alternative 2 was rated higher overall than Alternative 3 because it provides the recommended development at the airport for the least amount of money. Alternative 2 is ranked first based on the five evaluation criteria.

6.05 Preferred Alternative

The preferred alternative for development of Floyd Bennett Memorial Airport was selected after discussions with Warren County officials, airport management, the Airport Advisory Committee and other interested parties. It includes elements from several of the development concepts presented in this chapter. Specifically, it includes development of a 6,000-foot runway and associated taxiway with a 1,000-foot phased extension to the Runway 1 end.

T-hangar development is proposed on existing apron space adjacent to the existing 6-bay T-hangars and on the existing based aircraft tie-down apron. Access will remain the same and lead to an expanded general aviation parking area. An area north of the existing conventional hangar is the proposed site for a new multi-purpose hangar.

A parallel taxiway to Runway 12-30 is proposed to stem off of Taxiway "C" and run along the north side of the Runway. The taxiway will be approximately 3,000 feet long and have a width of 35 feet to accommodate Airplane Design Group II aircraft.

An area suitable for apron expansion is located north of the ARFF building. This location for based and itinerant aircraft parking would abut the terminal apron-north on one side and a site for future aviation development on the other. A second site selected for overflow aircraft parking is located across the terminal apron from the terminal building.

Sites suitable for hangar/apron development have been identified along taxiway "A". A site located north and west of the Runway 19 end has been selected for future industrial/aviation development. This site is currently on airport property, has access to Hicks Road, and is planned to have taxiway access to the Runway 19 end.

The Airport Layout Plan presented in Chapter 7 will depict the proposed development for the 20-year planning period.

Chapter 7 - Airport System Design

7.01 General

This chapter discusses the development program for Floyd Bennett Memorial Airport to the year 2020. This airport system design is based upon the airport's existing facilities, the recommended facility requirements and airport development alternatives discussed in Chapter 6, and a list of capital improvement projects planned to satisfy aviation demand to the year 2020.

7.02 Facility Requirements

As previously stated in this master plan report, the role of the airport will be as a transport-category, Airport Reference Code D-II Airport. The facility is expected to accommodate aircraft having approach speeds up to 166 knots (Aircraft Approach Categories A, B, C and D) and wingspans up to, but not including, 79 feet (Airplane Design Groups I and II). Planning standards contained in FAA AC 150/5300-13, *Airport Design*, were used as guidance in planning development at the airport.

Tables 7-1 and 7-2 identify the airside and landside facility requirements for the 20-year development period as determined in Chapter 4.

The Airport Layout Plan (ALP), depicted on Sheet 3 of 10 included at the end of this chapter, was developed as a result of these facility requirements, discussions with the airport management and members of the Airport Advisory Committee, and by incorporating comments made by the NYSDOT Aviation Services Bureau during their review of the Phase 1 and Phase 2 reports. The plan incorporates elements from several of the alternatives presented in Chapter 6. It includes a phased 1,000-foot extension of Runway 1 and associated Taxiway E providing a runway length of 6,000 feet (Phase 1 is 500 feet and Phase 2 is 500 feet). The existing FBO hangar is to be refurbished and a new FBO hangar will be built at a later phase. A parallel taxiway to Runway 12-30 will be constructed and taxiway access provided from Runway 19 to a future Industrial/Aviation park from Runway 19. A new maintenance building that includes sand storage facilities will be constructed east of the existing FBO hangar. T-hangar development occurs, providing 28 new bays. A tie-down apron will be constructed north of the auto parking lot and future sites for apron/hangar development along Taxiway A are shown on the plan.

TABLE 7-1
AIRSIDE FACILITIES SUMMARY

Item	Existing	Proposed
Runways:		
1-19	5,000' x 150'	6,000' x 150'[1]
12-30	4,000' x 100'	4,000 x 150'
Taxiways:		
1-19	Access Taxiway	Access Taxiway
12-30	None	Full Parallel
Lighting:		
1-19	HIRL, MITL, MALSR	HIRL, MITL, MALSR
12-30	MIRL, MITL	MIRL, MITL, REILS
Navigation Aids:	VASI, ILS (R/W 1), GPS (RW 19) NDB	PAPI (RW 1-19 and 12-30), ILS (RW1), GPS (RW 19), NDB

Legend:

HIRL	High Intensity Runway Lights
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
VASI	Visual Approach Slope Indicator
NDB	Non-directional Beacon
PAPI	Precision Approach Path Indicators
REIL	Runway End Identifier Lights
ILS	Instrument landing System
MALSR	Medium Intensity Approach Light System with Runway Alignment Indicator Lights
GPS	Global Positioning Satellite

[1]Appendix G, Supplemental Runway Length Analysis, provides data that supports the need for the runway extension

Source: C&S Engineers, Inc.

TABLE 7-2
LANDSIDE FACILITIES SUMMARY

Item	Existing	Proposed
Terminal:	2,424 SF	4,000 SF
Hangars:		
Conventional	0 SF	38,800 SF
T-Hangar	19,750 SF	60,200 SF
FBO	13,750 SF	9,900 SF
TOTAL	33,500 SF	108,900 SF
Apron:		
Itinerant	25,300 SY	60,000 SY
Based	10,300 SY	4,500 SY
FBO Maintenance	1,100 SY	1,100 SY
Hangar Apron	0 SY	4,316 SY
TOTAL	36,700 SY	69,900 SY
Auto Parking:		
# of Spaces	110	95
Area	4,400 SY	3,800 SY
Fuel Demand:		
(Two week peak)	100LL-11,965	100LL-19,588
	AVGAS-3,080	AVGAS-5,236
TOTAL	**15,045 Gal.**	**24,824 Gal.**

Source: C&S Engineers, Inc.

7.03 Airport Layout Plan

The Airport Layout Plan (Sheet 3 of 10) illustrates the overall development plan for Floyd Bennett Memorial Airport. The ALP presents the various airport improvement projects in three phases that are discussed below. As development opportunities arise at the Airport, some long-range projects may need to be completed sooner than expected. The phasing plan may be adjusted based on private investment and development opportunities.

PHASE 1 DEVELOPMENT

Phase 1, or the short-term development, at Floyd Bennett Memorial Airport is concentrated on satisfying existing needs and correcting existing problems. These projects are considered to be the highest priorities in the development plan, and are supported by findings reached during previous portions of this study. The Phase 1 recommendations are:

- Design and construct 500-foot extension on Runway 1 (Phase 1),
- Construct T-hangars,
- Refurbish existing conventional hangar,
- Construct based/itinerant aircraft parking apron,

- Construct new maintenance/sand storage building,
- Construct overflow aircraft parking area,
- Install security entry fence,
- Rehabilitate RW 1-19 and 12-30 lighting and install REILS,
- Stormwater pollution prevention plan,
- Runway 12-30 safety area improvements and crack sealing,
- Purchase snow removal equipment,
- Install runway surface sensor,
- Rehabilitate Taxiways B, D and E,
- Runway 1-19 off-airport obstruction removal,
- Runway 1 end safety area improvements,
- Runway 12-30 off-airport obstruction removal,
- Install sanitary sewer line, and
- Environmental assessment for Master Plan projects.

PHASE 2 DEVELOPMENT

The intermediate-range development, Phase 2, encompasses the period 2006-2010 and includes airside and landside improvements.

- Construct parallel taxiway on Runway 12-30,
- Construct helipad,
- Rehabilitate Runway 12-30, and
- Pavement rehabilitation on airport access road.

PHASE 3 DEVELOPMENT

The long-range development, Phase 3, covers the period from 2011-2020. In this phase, additional airside and landside facilities are planned to be in place to satisfy the requirements defined in this plan.

- Design and construct 500-foot extension to Runway 1 (Phase 2),
- Construct new conventional hangar,
- Construct taxiway access to industrial/aviation park, and
- Install PAPIs on Runways 1-19 and 12-30.

7.04 Obstruction Plan and Profile

The Obstruction Plans and Profiles for the airport, presented on Sheets 5 through 8 of the Airport Layout Plan drawing set, provide detailed obstruction information and depict the imaginary surfaces on and around Floyd Bennett Memorial Airport, through which no object should penetrate. The dimensions and criteria employed in determining these obstructions on or near the surfaces for the airport are those outlined in Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. Obstruction data from the Floyd Bennett Memorial Airport Obstruction Study, completed in July 2001, were used for this analysis.

As defined by FAR Part 77, the **primary surface** of a runway is defined as an area longitudinally centered on the runway for a width dependent on the type of runway, and extending 200 feet beyond each end of the landing threshold. At Floyd Bennett Memorial Airport, Runway 1-19 is defined as a transport-category runway with a precision instrument approach. Therefore, its planned primary surface width is 1,000 feet. Runway 12-30 is a visual runway with a primary surface width of 500 feet.

A terrain obstruction lies easterly of the Runway 19 end, and consists of approximately 0.12 acre of terrain within the primary surface. There are no obstructions to the primary surface of Runway 12-30. See Sheet 5 of 10 for specific obstruction information and recommended actions.

Approach surfaces are longitudinally centered on the extended runway centerline and extend outward and upward from each end of the primary surface. The slope and configuration of each runway approach surface also vary as a function of runway type and availability of instrument approaches. As previously mentioned, Runway 1-19 is a transport-category runway with a precision approach to Runway 1. Runway 19 has a non-precision approach. Therefore, Runway 1 has an approach surface with an inner width of 1,000 feet that extends outward and upward at a 50 to 1 slope for a distance of 10,000 feet, and then extending an additional 40,000 feet at a 40 to 1 slope, to a width of 16,000 feet. Runway 19 has an approach surface with an inner width of 1,000 feet that extends outward and upward at a slope of 34 to 1 for a distance of 10,000 feet, to a width of 3,500 feet. Runway 12-30 has approach surfaces for both runway ends with inner widths of 500 feet, extending outward and upward at a 20 to 1 slope for a distance of 5,000 feet to an outer width of 1,500 feet.

There are nineteen obstructions to the Runway 1 approach surface; the obstructions are trees, terrain and a road. There are 41 obstructions to the Runway 19 approach surface, consisting of trees, a pole and a building. The Runway 12 approach has five trees which are obstructions to the approach surface. The Runway 30 approach has four trees and tree canopy area covering 4.89 acres, which are obstructions to the approach surface. See Sheet 5 of 10 for specific obstruction information and recommended actions.

The **transitional surfaces** extend outward and upward from the primary and approach surfaces to the horizontal surface at right angles to the runway centerline at a slope of 7 to 1. There are 43 obstructions to Runway 1-19's transitional surfaces. There are seven obstructions to Runway 12-30's transitional surfaces. Similar in nature to the primary and approach surface obstructions, many of the transitional surface obstructions include individual trees and groups of trees. Once again, specific obstruction information and corrective actions are shown on Sheet 5 of 10.

RUNWAY PROTECTION ZONES (RPZ)

Runway protection zones are also shown on the Airport Layout Plan drawings. As defined by FAA A/C 150/5300-13, *Airport Design*, the function of the RPZ is *to enhance the protection of people and property on the ground by clearing RPZ areas (and maintaining them clear of incompatible objects and activities)*. This is best done by obtaining property interest in the RPZ area giving the airport owner the desired degree of control. The RPZ is trapezoidal in shape and centered on the extended

runway centerline. The dimensions of the RPZ are determined by the type of aircraft that the facility expects to serve, and by the approach visibility minimums for each runway end. The RPZ begins at the end of the primary surface with an inner width the same as the width of the primary surface which it adjoins. The RPZ dimensional standards for the four runway ends are listed in Table 7-3.

TABLE 7-3
RUNWAY PROTECTION ZONE DIMENSIONS

	Inner Width (Feet)	Outer Width (Feet)	Length (Feet)
Runway 1	1,000	1,750	2,500
Runway 19	500	1,010	1,700
Runway 12	500	700	1,000
Runway 30	500	700	1,000

Source: C&S Engineers, Inc.

The RPZ dimensions represent the required configurations to serve the aircraft and provide the approach visibility minimums that have been planned for the airport. For example, the above-described dimensions for Runway 1 RPZ are necessary to achieve Category I ILS visibility minimums. The airport does not currently control all of the land in the Runway Protection Zones. Therefore, land and/or easement acquisitions are necessary to assure the airport some form of control over current and future objects and obstructions in these areas, which is considered critical to the continued safe operation of the airport.

THRESHOLD SITING ANALYSIS

FAA Advisory Circular 150/5300-13 *Airport Design,* outlines runway threshold siting requirements in Appendix 2, and states that a "runway threshold should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object that obstructs the airspace required for landing airplanes is beyond the airport authority's power to remove, relocate, or lower."

"Displacement of a threshold reduces the length of runway available for landings. Depending on the reason for displacement of the threshold, the portion of the runway behind a displaced threshold may be available for take-off in either direction and landing from the opposite direction."

The standard shape, dimensions, and slope of the surface used for locating a threshold is dependent upon the type of aircraft operations currently conducted or forecasted, the landing visibility minimums desired, and the types of instrumentation available or planned for that runway end. The threshold siting surface categories for each of the runway ends were defined in Section 2.11, which provides a threshold siting analysis for existing conditions.

THRESHOLD SITING BASED ON EXISTING CONDITIONS

The proposed extension of Runway 1 moves the 34:1 threshold siting surface for the runway end 1,000 feet to the south. This surface is penetrated by obstructions noted above for the approach surface and depicted on Sheets 5 and 6 of 10. If no obstruction removal were to occur, these obstructions would require a 2,068-foot displacement of the threshold.

All objects noted in the threshold siting analysis and the corrective action recommended for each, as part of the obstruction study, are indicated on Sheet 5 of 10.

OBSTRUCTION SUMMARY

It should be noted that an object is considered an obstruction if it penetrates an FAR Part 77 surface. A bush or tree top located within 10 feet of an FAR Part 77 surface may also be considered an obstruction. In addition, FAA design standards recommend clearing the entire Runway Protection Zone of all aboveground objects. As can be seen from the previous information, the Runway 1 threshold siting surface would need to be displaced 1,034 feet based on existing conditions. A 1,000-foot extension on the Runway 1 end would require a 2,068-foot displacement of the threshold.

Depending on the extent of obstruction removal, the Runway 30 threshold needs to be displaced between 470 and 640 feet. Depending on the extent of obstruction removal, the Runway 19 threshold needs to be displaced between 347 and 1,012 feet. There are no known obstructions in the threshold siting surface for the Runway 12 end. Obstruction removal is recommended in the phasing of projects for the airport. In order to control the future construction of obstacles that may hamper the safe operation of aircraft using Floyd Bennett Memorial Airport, it is recommended that this Obstruction Plan and Profile be incorporated into the zoning ordinances of the municipalities surrounding the airport.

7.05 Compatible Land Use

Sheet 9 of 10, the Land Use Plan, indicates the overall pattern of land use and ground access around Floyd Bennett Memorial Airport. The Airport is located off Interstate 87, the Adirondack Northway, which serves Warren and Washington Counties and extends from the New York State Thruway (I-90) at Albany, north to the Canadian border. Access to the airport from Interstate 87 is off Exit 19, heading easterly on Route 254 to Queensbury Avenue, approximately 4 miles. The airport is located about 3 miles northeast of Glens Falls. The airport entrance is on the left, approximately one-mile north on Queensbury Avenue.

The immediate area surrounding the airport is a mixture of Residential, Recreational, Open Space, Commercial, and Industrial uses. Although the airport does not have a history of frequent aircraft noise-related complaints, the approach and departure paths to most airports may receive a higher level of perceived noise exposure due to aircraft overflights. Therefore,

the following land use compatibility measures should be considered for residential areas and other noise-sensitive land uses to be sited within 1,000 feet of the approach and departure flight paths.

COMPREHENSIVE PLANNING AND ZONING

Warren County and the communities near the airport are encouraged to establish an Airport Approach District which will serve to inform nearby residents of potential impacts and discourage residential development in the runway approach areas. An effective working relationship between the airport and the surrounding communities is perhaps ***the most important single step*** in accomplishing the process of compatible land use planning and support for achieving airport-oriented land use measures. As an example, in certain cases (such as the erection of water towers, communications, antennae, etc.) structures may penetrate the approach or navigational airway surfaces associated with runways at the airport. Determinations of the height of structures by airport and community representatives on a case-by-case basis may be necessary to insure that consideration is given to the placement of potential hazards near the airport. This process should include information available to airport personnel transmitted through an active involvement in community affairs.

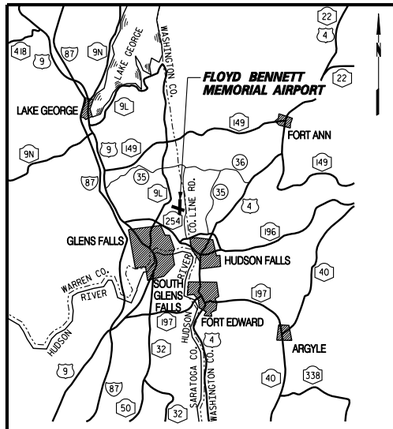
ENCOURAGE AND MAINTAIN COMPATIBLE LAND USES

Recognizing that low-density residential development may not and most likely should not be eliminated from all areas near the airport that may be impacted by some level of aircraft sound, a policy of encouraging compatible development is recommended. This includes continued promotion of open land and industrial/commercial development in available vacant areas near the airport. To this end, the airport should make it a goal have adequate property interests in all of the land within the RPZs and additional adjoining land as feasible.

CAPITAL IMPROVEMENTS PROGRAM

Airport representatives should also remain aware of community expenditures for various capital improvements and encourage those that will directly or indirectly increase compatible land use in the airport vicinity. For example, the extension of sewer or water lines into new areas, often done initially to serve industrial or institutional development, frequently encourages residential development that also utilizes this community infrastructure. Thus, the extension of services to potentially airport-sensitive land uses near the airport should be reviewed.

The use of these basic approaches, within the time frame of this airport master plan should reduce or eliminate the likelihood of problems over potential airport related land use impacts. Moreover, until and unless airport traffic increases substantially above the forecasted numbers, there will be no impact at all.



LOCATION MAP
NOT TO SCALE

AIRPORT MASTER PLAN

FLOYD BENNETT MEMORIAL AIRPORT

GLENS FALLS, NEW YORK

AIP NO. 3–36–0033–17–98
NYSDOT NO. 1903.58

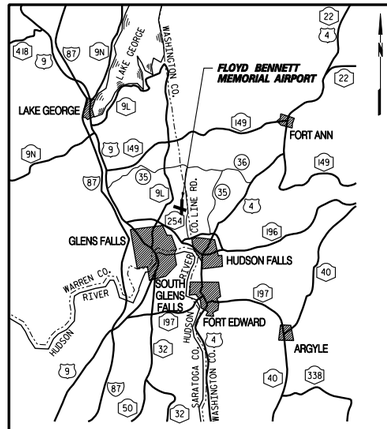
SHEET NO.	TITLE
1.	TITLE SHEET
2.	EXISTING AIRPORT LAYOUT
3.	AIRPORT LAYOUT PLAN
4.	TERMINAL AREA PLAN
5.	AIRPORT AIRSPACE & OBSTRUCTION DATA
6.	RUNWAY 1 APPROACH PLAN & PROFILE
7.	RUNWAY 19 APPROACH PLAN & PROFILE
8.	RUNWAY 12–30 APPROACH PLANS & PROFILES
9.	LAND USE PLAN
10.	AIRPORT PROPERTY MAP

JUNE 2009

C&S COMPANIES
C&S Engineers, Inc.
499 Col. Eileen Collins Blvd.
Syracuse, New York 13212
Phone: 315-455-2000
Fax: 315-455-9667
www.cscos.com

REFNAME

F:\Project\107 - Warren County\10701601\cadd\10701601\1629ap00.dgn



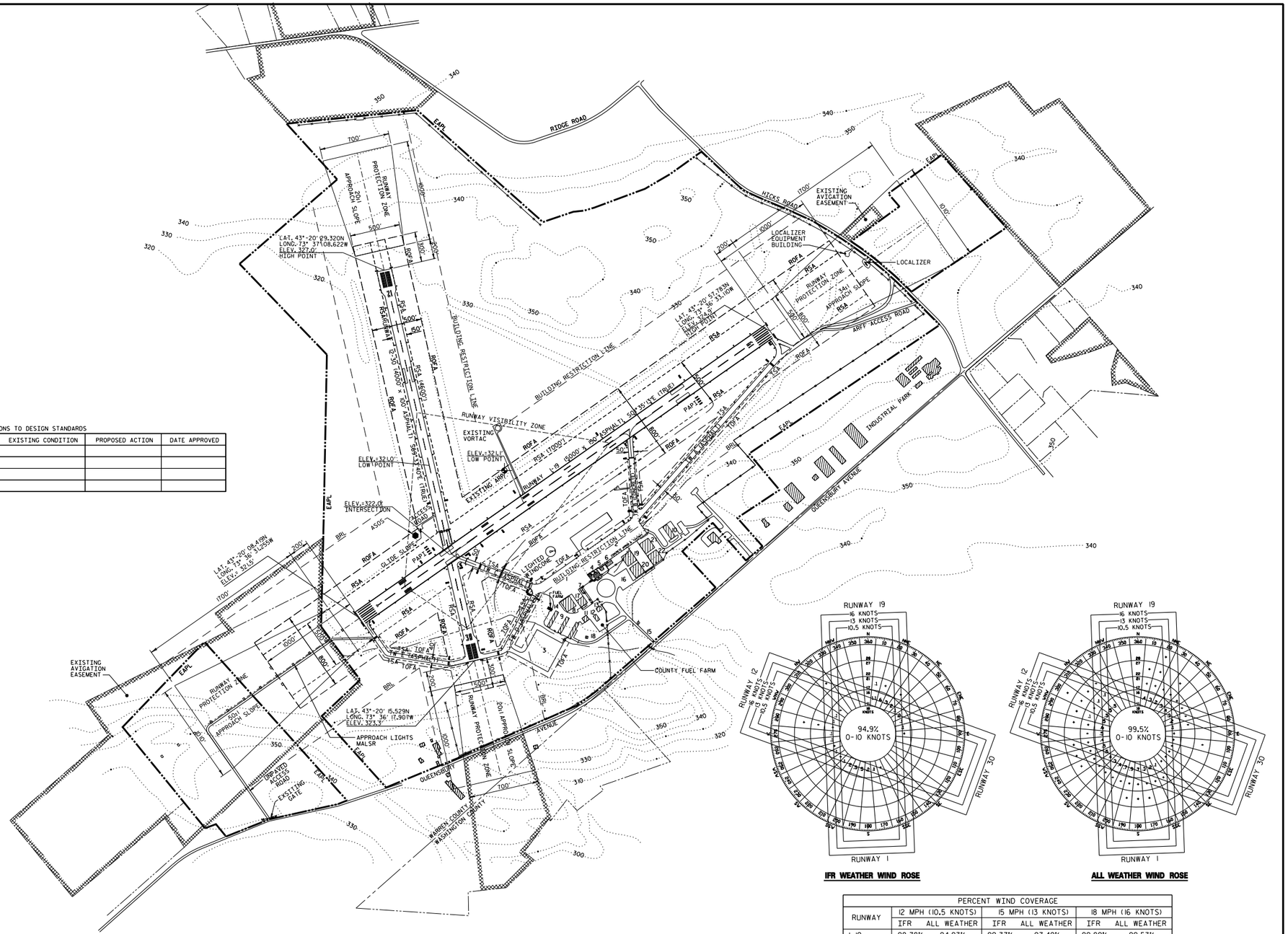
LOCATION MAP
NOT TO SCALE

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH	500'	150'
	LENGTH	7,000'	4,600'
ROFA	WIDTH	800'	500'
	LENGTH	7,000'	4,600'
TSA	WIDTH	118'	79'
TOFA	WIDTH	186'	131'

MODIFICATIONS TO DESIGN STANDARDS

NO.	STANDARD MODIFIED	FAA STANDARDS	EXISTING CONDITION	PROPOSED ACTION	DATE APPROVED

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGARS (3-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE HANGAR
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	MAINTENANCE HANGAR
18	LEACH FIELD
19	CONVENTIONAL HANGAR
20	CONVENTIONAL HANGAR
21	CONVENTIONAL HANGAR
22	CONVENTIONAL HANGAR



FAR PART 77 CATEGORY	12 VISUAL 30 VISUAL	1 PRECISION 19 NON-PRECISION

NOTE:

MINIMUM SEPARATION DISTANCE FROM RUNWAY 1-19 TO PARALLEL TAXIWAY IS 400'

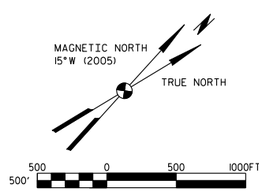
IFR WEATHER WIND ROSE

ALL WEATHER WIND ROSE

PERCENT WIND COVERAGE						
RUNWAY	12 MPH (10.5 KNOTS)		15 MPH (13 KNOTS)		18 MPH (16 KNOTS)	
	IFR	ALL WEATHER	IFR	ALL WEATHER	IFR	ALL WEATHER
1-19	98.78%	94.93%	99.37%	97.49%	99.89%	99.53%
12-30	96.07%	94.17%	97.68%	96.86%	99.67%	99.50%
COMBINED	99.67%	98.78%	99.96%	99.79%	100.00%	99.93%

SOURCE: NATIONAL CLIMATIC DATA CENTER, ASHVILLE, NORTH CAROLINA
PERIOD COVERED: 1994-2003

▪ LATITUDE / LONGITUDE AND ELEVATION DATA IS FROM FAA FORM 5010 (4-20-2000)



RENAME

AIRPORT DATA

ITEMS	EXISTING
AIRPORT ELEVATION (MSL) ▪	328'
REFERENCE POINT (ARP) LAT. ▪	43°20'28.356" N
REFERENCE POINT (ARP) LONG. ▪	73°36'37.107" W
MEAN MAXIMUM TEMPERATURE	79°F
MAGNETIC VARIATION (YEAR)	15°W (2005)
AIRPORT CATEGORY	TRANSPORT
CRITICAL AIRCRAFT / ARC	DC-9 / CIII
AIRPORT NAVAIDS	VORTAC, ROTATING BEACON, DIRECTION FINDER, LIGHT WINDCONE

RUNWAY DATA

ITEMS	RUNWAY 1 - 19	RUNWAY 12 - 30
	EXISTING	EXISTING
PHYSICAL LENGTH & WIDTH	5000' X 150' (ASPHALT-GROOVED)	4000' X 100' (ASPHALT)
EFFECTIVE GRADIENT (%)	0.1%	0.15%
WIND COVERAGE (%) (13 KNOTS)	97.49%	96.86%
PAVEMENT STRENGTH (000 LBS.)	SW80, DW110, DTW 180	SW39, DW53, DTW 76
APPROACH SURFACES	RW1- 50:1/RW19 - 34:1	20:1
RUNWAY LIGHTING	HIRL	MIRL
RUNWAY MARKING	PRECISION INSTR.(1) NON-PRECISION INSTR.(19)	BASIC (12-30)
NAVIGATION AIDS	ILS, TVOR, VASI	

LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
CONTOUR LINE	800
RUNWAY SAFETY AREA (RSA)	RSA
EXISTING EASEMENT LIMIT	
EXISTING FENCE	

REVISIONS

BY	DATE	CHANGE

FIGURE 2-2

FLOYD BENNETT MEMORIAL AIRPORT

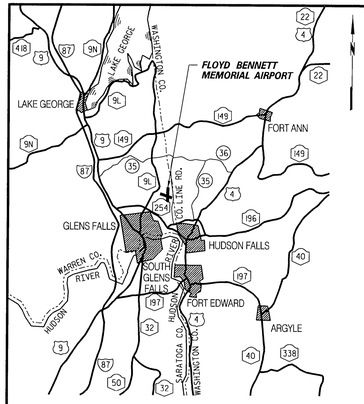
QUEENSBURY, NEW YORK — WARREN COUNTY

EXISTING AIRPORT LAYOUT

DESIGNED: JCT	DRAWN: JCT	SHEET 2 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP04.DGN	

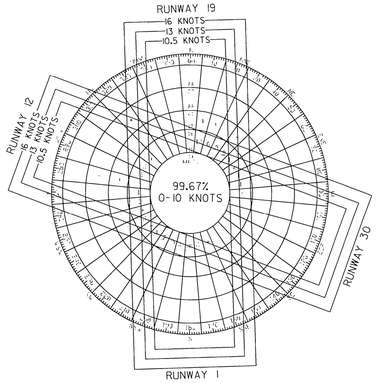
C&S COMPANIES

F:\Project\107 - Warren County\10701601\cadd\10701601\1629ap04.dgn

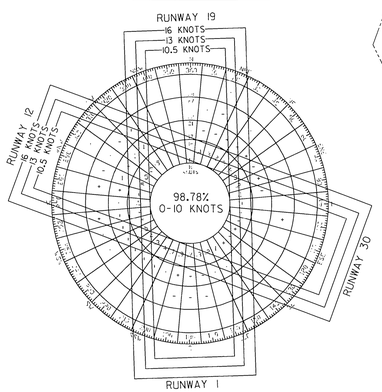


LOCATION MAP

NOT TO SCALE



IFR WEATHER WIND ROSE



ALL WEATHER WIND ROSE

PERCENT WIND COVERAGE						
RUNWAY	10 MPH (10.5 KNOTS)		13 MPH (13 KNOTS)		16 MPH (16 KNOTS)	
	IFR	ALL WEATHER	IFR	ALL WEATHER	IFR	ALL WEATHER
1-19	98.78%	94.93%	99.37%	97.49%	99.89%	99.53%
12-30	96.07%	94.17%	97.68%	96.86%	99.67%	99.50%
COMBINED	99.67%	98.78%	99.96%	99.79%	100.00%	99.93%

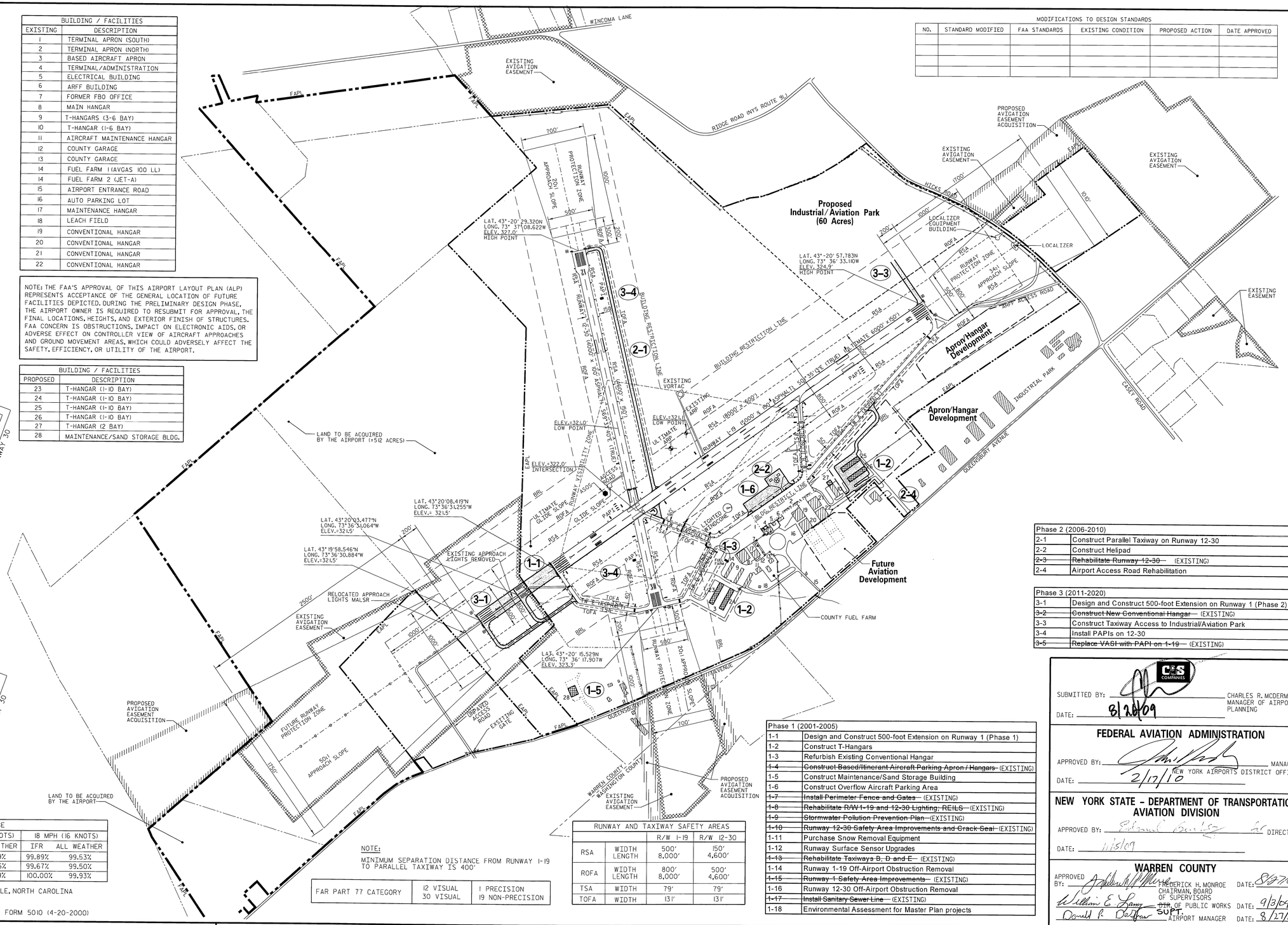
SOURCE: NATIONAL CLIMATIC DATA CENTER, ASHVILLE, NORTH CAROLINA
PERIOD COVERED: 1994-2003

• LATITUDE / LONGITUDE AND ELEVATION DATA IS FROM FAA FORM 5010 (4-20-2000)

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGARS (3-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE HANGAR
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	MAINTENANCE HANGAR
18	LEACH FIELD
19	CONVENTIONAL HANGAR
20	CONVENTIONAL HANGAR
21	CONVENTIONAL HANGAR
22	CONVENTIONAL HANGAR

NOTE: THE FAA'S APPROVAL OF THIS AIRPORT LAYOUT PLAN (ALP) REPRESENTS ACCEPTANCE OF THE GENERAL LOCATION OF FUTURE FACILITIES DEPICTED. DURING THE PRELIMINARY DESIGN PHASE, THE AIRPORT OWNER IS REQUIRED TO RESUBMIT FOR APPROVAL, THE FINAL LOCATIONS, HEIGHTS, AND EXTERIOR FINISH OF STRUCTURES. FAA CONCERN IS OBSTRUCTIONS, IMPACT ON ELECTRONIC AIDS, OR ADVERSE EFFECT ON CONTROLLER VIEW OF AIRCRAFT APPROACHES AND GROUND MOVEMENT AREAS, WHICH COULD ADVERSELY AFFECT THE SAFETY, EFFICIENCY, OR UTILITY OF THE AIRPORT.

BUILDING / FACILITIES	
PROPOSED	DESCRIPTION
23	T-HANGAR (1-10 BAY)
24	T-HANGAR (1-10 BAY)
25	T-HANGAR (1-10 BAY)
26	T-HANGAR (1-10 BAY)
27	T-HANGAR (2 BAY)
28	MAINTENANCE/SAND STORAGE BLDG.



NOTE:

MINIMUM SEPARATION DISTANCE FROM RUNWAY 1-19 TO PARALLEL TAXIWAY IS 400'

FAR PART 77 CATEGORY	12 VISUAL 30 VISUAL	1 PRECISION 19 NON-PRECISION

RUNWAY AND TAXIWAY SAFETY AREAS			
		R/W 1-19	R/W 12-30
RSA	WIDTH	500'	150'
	LENGTH	8,000'	4,600'
ROFA	WIDTH	800'	500'
	LENGTH	8,000'	4,600'
TSA	WIDTH	79'	79'
TOFA	WIDTH	131'	131'

MODIFICATIONS TO DESIGN STANDARDS					
NO.	STANDARD MODIFIED	FAA STANDARDS	EXISTING CONDITION	PROPOSED ACTION	DATE APPROVED

Phase 2 (2006-2010)	
2-1	Construct Parallel Taxiway on Runway 12-30
2-2	Construct Helipad
~~2-3~~	~~Rehabilitate Runway 12-30~~ (EXISTING)
2-4	Airport Access Road Rehabilitation

Phase 3 (2011-2020)	
3-1	Design and Construct 500-foot Extension on Runway 1 (Phase 2)
~~3-2~~	~~Construct New Conventional Hangar~~ (EXISTING)
3-3	Construct Taxiway Access to Industrial/Aviation Park
3-4	Install PAPIs on 12-30
~~3-5~~	~~Replace VASI with PAPI on 1-19~~ (EXISTING)

Phase 1 (2001-2005)	
1-1	Design and Construct 500-foot Extension on Runway 1 (Phase 1)
1-2	Construct T-Hangars
1-3	Refurbish Existing Conventional Hangar
~~1-4~~	~~Construct Based/Itinerant Aircraft Parking Apron / Hangars~~ (EXISTING)
1-5	Construct Maintenance/Sand Storage Building
1-6	Construct Overflow Aircraft Parking Area
~~1-7~~	~~Install Perimeter Fence and Gates~~ (EXISTING)
~~1-8~~	~~Rehabilitate R/W 1-19 and 12-30 Lighting; REILS~~ (EXISTING)
~~1-9~~	~~Stormwater Pollution Prevention Plan~~ (EXISTING)
~~1-10~~	~~Runway 12-30 Safety Area Improvements and Crack Seal~~ (EXISTING)
1-11	Purchase Snow Removal Equipment
1-12	Runway Surface Sensor Upgrades
~~1-13~~	~~Rehabilitate Taxiways B, D and E~~ (EXISTING)
1-14	Runway 1-19 Off-Airport Obstruction Removal
~~1-15~~	~~Runway 1 Safety Area Improvements~~ (EXISTING)
1-16	Runway 12-30 Off-Airport Obstruction Removal
~~1-17~~	~~Install Sanitary Sewer Line~~ (EXISTING)
1-18	Environmental Assessment for Master Plan projects

SUBMITTED BY: _____ CHARLES R. MCDERMOTT, MANAGER OF AIRPORT PLANNING
DATE: 8/20/09

FEDERAL AVIATION ADMINISTRATION

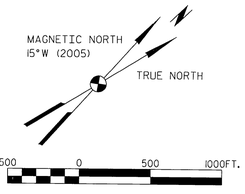
APPROVED BY: _____ MANAGER, NEW YORK AIRPORTS DISTRICT OFFICE
DATE: 2/17/10

NEW YORK STATE - DEPARTMENT OF TRANSPORTATION AVIATION DIVISION

APPROVED BY: _____ DIRECTOR
DATE: 11/5/09

WARREN COUNTY

APPROVED BY: _____ FREDERICK H. MONROE, CHAIRMAN, BOARD OF SUPERVISORS DATE: 8/27/09
_____ DIR. OF PUBLIC WORKS DATE: 9/3/09
_____ AIRPORT MANAGER DATE: 8/27/09



AIRPORT DATA

ITEMS	EXISTING	FUTURE
AIRPORT ELEVATION (MSL) •	328'	328'
REFERENCE POINT (ARP) LAT. •	43° 20' 28.356" N	43° 20' 25.869" N
REFERENCE POINT (ARP) LONG. •	73° 36' 37.107" W	73° 36' 36.504" W
MEAN MAXIMUM TEMPERATURE	79°F	79°F
MAGNETIC VARIATION (YEAR)	15°W (2005)	15°W (2005)
AIRPORT CATEGORY	TRANSPORT	TRANSPORT
CRITICAL AIRCRAFT / ARC	DC-9 / CIII	R/W 1-19 G-4 DII; R/W 12-30 BII
AIRPORT NAVAIDS	VORTAC, ROTATING BEACON, DIRECTION FINDER, LIGHT WINDCONE	VORTAC, ROTATING BEACON, DIRECTION FINDER, LIGHT WINDCONE

RUNWAY DATA

ITEMS	RUNWAY 1 - 19		RUNWAY 12 - 30	
	EXISTING	FUTURE	EXISTING	FUTURE
PHYSICAL LENGTH & WIDTH	5000' X 150' (ASPHALT-GROOVED)	6000' X 150' (ASPHALT-GROOVED)	4000' X 100' (ASPHALT)	4000' X 100' (ASPHALT)
EFFECTIVE GRADIENT (%)	0.1%	0.1%	0.15%	0.15%
WIND COVERAGE (%) (13 KNOTS)	97.49%	97.49%	96.86%	96.86%
PAVEMENT STRENGTH (000 LBS.)	SW80, DW110, DTW 180	SW80, DW110, DTW 180	SW39, DW53, DTW 76	SW39, DW53, DTW 76
APPROACH SURFACES	RW1- 50:1/RW19 - 34:1	RW1- 50:1/RW19 - 34:1	20:1	20:1
RUNWAY LIGHTING	HIRL	HIRL	MIRL	MIRL
RUNWAY MARKING	PRECISION INSTR. (1) NON-PRECISION INSTR. (19)	PRECISION INSTR. (1) NON-PRECISION INSTR. (19)	BASIC (12-30)	BASIC (12-30)
NAVIGATION/VISUAL AIDS	ILS, TVOR, VASI	ILS, TVOR, PAPI, REIL'S	REILS	PAPI

LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	FAPL
RUNWAY OBJECT FREE AREA (ROFA)	ROFA
CONTOUR LINE	800
RUNWAY SAFETY AREA (RSA)	RSA
FUTURE BUILDING	
EXISTING FENCE	

REVISIONS

BY	DATE	CHANGE

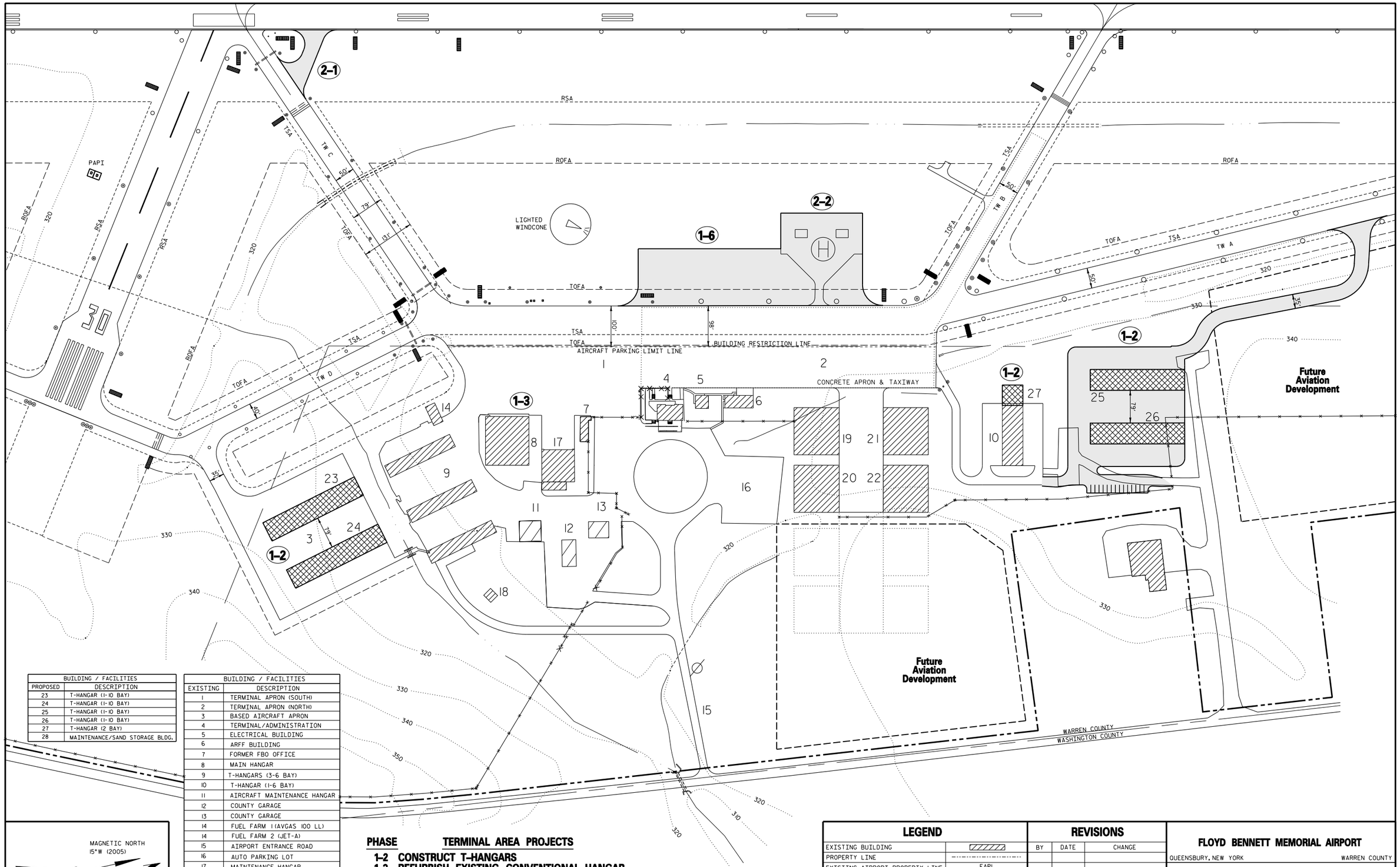
FIGURE 7-1

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

AIRPORT LAYOUT PLAN

DESIGNED: JCT	DRAWN: JCT	SHEET 3 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP07.DGN	



BUILDING / FACILITIES	
PROPOSED	DESCRIPTION
23	T-HANGAR (1-10 BAY)
24	T-HANGAR (1-10 BAY)
25	T-HANGAR (1-10 BAY)
26	T-HANGAR (1-10 BAY)
27	T-HANGAR (2 BAY)
28	MAINTENANCE/SAND STORAGE BLDG.

BUILDING / FACILITIES	
EXISTING	DESCRIPTION
1	TERMINAL APRON (SOUTH)
2	TERMINAL APRON (NORTH)
3	BASED AIRCRAFT APRON
4	TERMINAL/ADMINISTRATION
5	ELECTRICAL BUILDING
6	ARFF BUILDING
7	FORMER FBO OFFICE
8	MAIN HANGAR
9	T-HANGARS (3-6 BAY)
10	T-HANGAR (1-6 BAY)
11	AIRCRAFT MAINTENANCE HANGAR
12	COUNTY GARAGE
13	COUNTY GARAGE
14	FUEL FARM 1 (AVGAS 100 LL)
14	FUEL FARM 2 (JET-A)
15	AIRPORT ENTRANCE ROAD
16	AUTO PARKING LOT
17	MAINTENANCE HANGAR
18	LEACH FIELD
19	CONVENTIONAL HANGAR
20	CONVENTIONAL HANGAR
21	CONVENTIONAL HANGAR
22	CONVENTIONAL HANGAR

PHASE — TERMINAL AREA PROJECTS

- **1-2 CONSTRUCT T-HANGARS**
- **1-3 REFURBISH EXISTING CONVENTIONAL HANGAR**
- **1-5 CONSTRUCT MAINTENANCE /SAND STORAGE BUILDING**
- **1-6 CONSTRUCT OVERFLOW AIRCRAFT PARKING AREA**
- **2-1 CONSTRUCT PARALLEL TAXIWAY ON RUNWAY 12-30**
- **2-2 CONSTRUCT HELIPAD**

LEGEND

EXISTING BUILDING	
PROPERTY LINE	
EXISTING AIRPORT PROPERTY LINE	EAPL
RUNWAY OBJECT FREE AREA	ROFA
CONTOUR LINE	300
PROPOSED BUILDING	
EXISTING FENCE	

REVISIONS

BY	DATE	CHANGE

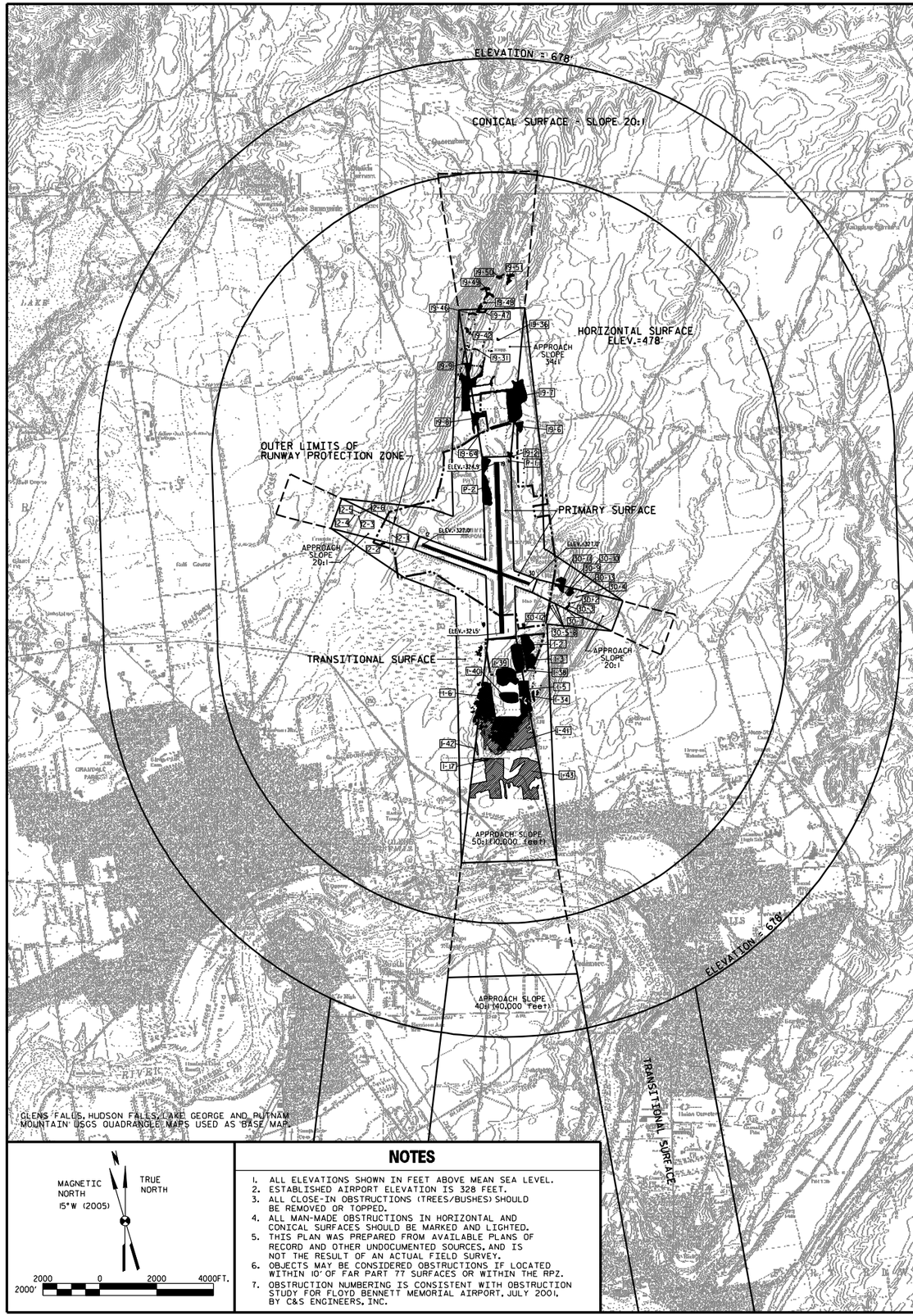
FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

TERMINAL AREA PLAN

DESIGNED: JCT	DRAWN: JCT	SHEET 4 OF 10
CHECKED: CRM, KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP10.DGN	

C S COMPANIES



Runway 12 Approach Surface
20:1 Approach Slope

Obstruction Number	Dist. From RW	Offset from Centerline (LT or RT)	(Ft)	Higest Obstructio	Penetration Surface	Surface	Object / Canopy Area (Acres)	Within RPZ	Within Wetland	Recommended Actions
12-1	1100'	LT	40'	371'	-1'	A	Tree	No	No	Remove
12-2	1360'	LT	450'	398'	-3'	T	0.108	No	No	Remove
12-3	2445'	RT	285'	430'	-9'	A	Tree	No	No	Remove
12-4	2690'	RT	170'	440'	-8'	A	Tree	No	No	Remove
12-5	2485'	RT	305'	430'	-10'	A	Tree	No	No	NA
12-6	2430'	RT	300'	430'	-8'	A	Tree	No	No	NA

Total Acres = 0.108

Runway 1-19 Primary & Transitional Surface

Obstruction Number	Station	Offset from Centerline (LT or RT)	(Ft)	Higest Obstruction	Penetration Surface	Surface	Object / Canopy Area (Acres)	Within RPZ	Within Wetlands	Recommended Actions
P-1	35'	RT	420'	330'	5'	P	0.12	No	No	Remove
P-2	550'	LT	400'	329'	3'	P	28,000cy	No	28,000cy	Excavate
P-3	739'	RT	904'	397'	5'	T	Tree	No	No	Remove
P-4	115'	RT	812'	395'	-9'	T	Tree	No	No	Remove
P-5	554'	RT	943'	394'	-4'	T	Tree	No	No	Remove
P-6	400'	RT	946'	393'	-5'	T	Tree	No	No	Remove

Total Acres = 0.12

Runway 19 Approach Surface
34:1 Approach Slope

Obstruction Number	Dist. From RW	Offset from Centerline (LT or RT)	(Ft)	Higest Obstruction	Penetration Surface	Surface	Object / Canopy Area (Acres)	Within RPZ	Within Wetlands	Recommended Actions
19-1					INTENTIONALLY NOT USED					
19-2	235'	RT	500	336'	10'	A	1	.321 ac	No	Remove
19-3	390'	RT	1760'	366'	0'	T	Tree	No	No	NA
19-4	400'	RT	1870'	378'	-8'	T	Tree	No	No	NA
19-5	550'	RT	1000'	403'	-7'	T	Tree	No	No	NA
19-6	1240'	RT	850'	399'	-5'	T	3.5	.057ac	No	Removed
19-7	2010'	RT	750'	390'	11'	A	18.3	1.37ac	No	Remove[3]
19-8	1500'	LT	700'	417'	54'	A	8.9	1.57ac	No	Remove
19-9	2570'	LT	980'	439'	14'	A	22.7	No	No	Remove[3]
19-10	2310'	LT	1250'	453'	-7'	T	Tree	No	No	NA
19-11	1030'	LT	600'	383'	34'	A	Tree	Yes	No	Removed
19-12	2870'	LT	1360'	483'	5'	T	Tree	No	No	Remove
19-13	2975'	LT	1315'	472'	-5'	T	Tree	No	No	NA
19-14	3150'	LT	1240'	474'	0'	T	Tree	No	No	NA
19-15	3250'	LT	1170'	448'	-9'	T	Tree	No	No	NA
19-16	3290'	LT	1160'	446'	-9'	T	Tree	No	No	NA
19-17	3370'	LT	1120'	447'	4'	T	Tree	No	No	Remove
19-18					INTENTIONALLY NOT USED					
19-19					INTENTIONALLY NOT USED					
19-20					INTENTIONALLY NOT USED					
19-21					INTENTIONALLY NOT USED					
19-22	4060'	LT	975'	466'	23'	A	Tree	No	No	Remove
19-23	4046'	LT	935'	447'	11'	A	Tree	No	No	Remove
19-24	3980'	LT	890'	440'	5'	A	Tree	No	No	Remove
19-25	3976'	LT	820'	446'	11'	A	Tree	No	No	Remove
19-26	4090'	LT	830'	457'	-2'	A	Tree	No	No	NA
19-27	4130'	LT	825'	437'	-2'	A	Tree	No	No	NA
19-28	4136'	LT	890'	455'	14'	A	Tree	No	No	Remove
19-29	4140'	LT	900'	461'	21'	A	Tree	No	No	Remove
19-30	4250'	LT	870'	446'	3'	A	Tree	No	No	Remove
19-31	4000'	LT	600'	429'	-7'	A	0.155	No	No	NA
19-32	4100'	LT	340'	441'	2'	A	Tree	No	No	Remove
19-33	4250'	LT	300'	457'	-7'	A	Tree	No	No	NA
19-34	3940'	LT	130'	428'	-5'	A	Tree	No	No	NA
19-35	3916'	LT	30'	435'	2'	A	0.068	No	No	Remove
19-36	4310'	RT	180'	434'	0'	A	0.095	No	No	NA
19-37	3435'	LT	740'	439'	19'	A	Tree	No	No	Remove
19-38	3426'	LT	670'	436'	17'	A	Tree	No	No	Remove
19-39	3410'	LT	581'	433'	14'	A	Tree	No	No	Remove
19-40	4996'	LT	910'	459'	1'	A	Building	No	No	Light
19-41	4700'	LT	75'	447'	-9'	A	Tree	No	No	NA
19-42	4710'	LT	870'	448'	-10'	A	0.183	No	No	NA
19-43	4856'	LT	1246'	468'	-10'	T	Tree	No	No	NA
19-44	5230'	LT	1000'	465'	-9'	A	Tree	No	No	NA
19-45	5070'	LT	785'	463	-9'	A	0.08	No	No	NA
19-46	5266'	LT	700'	471'	-4'	A	0.286	No	No	NA
19-47	5410'	LT	485'	493'	19'	A	0.922	No	No	Remove
19-48	5630'	LT	200'	493'	15'	H	0.078	No	No	Remove
19-49	5970'	LT	250'	486'	8'	H	1.38	No	No	Remove
19-50	5600'	LT	390'	493'	16'	H	0.402	No	No	Remove
19-51	5436'	LT	660'	494'	19'	H	0.869	No	No	Remove
19-52	2330'	LT	1310'	458'	-9'	T	Tree	No	No	NA
19-53					INTENTIONALLY NOT USED					
19-54					INTENTIONALLY NOT USED					
19-55					INTENTIONALLY NOT USED					
19-56	920'	LT	700'	365'	1'	T	Pole	No	No	Light
19-57	4535'	LT	790'	449'	-2'	A	Tree	No	No	NA
19-58	4610'	LT	745'	452'	-1'	A	Tree	No	No	NA
19-59	4720'	LT	730'	461'	3'	A	Tree	No	No	NA
19-60	4870'	LT	600'	461'	-1'	A	Tree	No	No	NA
19-61	5020'	LT	600'	461'	-6'	A	Tree	No	No	NA
19-62	3690'	LT	1020'	440'	-5'	A	Pole	No	No	Lighted
19-63					O M I T T E D					
19-64	1080'	LT	508'	337'	1'	A	Road (260')	Yes	No	NA

Total Acres = 52.518

Runway 30 Approach Surface
20:1 Approach Slope

Obstruction Number	Dist. From RW	Offset from Centerline (LT or RT)	(Ft)	Higest Obstruction	Penetration Surface	Surface	Object / Canopy Area (Acres)	Within RPZ	Within Wetland	Recommended Actions
30-1	1600'	RT	420'	388'	-9'	T	Tree	No	No	Remove
30-2	1645'	RT	120'	385'	-10	A	Tree	No	No	Remove
30-3	1535'	RT	130-430'	394'	5'	A	0.694	No	No	Remove
30-4	1730'	LT	120'	397'	-3'	A	Tree	No	No	Remove
30-5	1120'	RT	345'	381'	11'	T	Tree	No	No	Remove
30-6	1110'	RT	390'	373'	-7	T	Tree	No	No	Remove
30-7	1030'	RT	420'	390'	2'	T	Tree	No	No	Remove
30-8	912'	RT	460'	390'	0'	T	Tree	No	No	Remove
30-9	1280'	LT	120'	366'	-9'	A	Tree	No	No	Remove
30-10	1440'	LT	60-396'	384'	-1'	A	1.42	No	No	Remove
30-11	1025	LT	115-510'	399'	15'	A	2.78	.387 ac	No	Remove
30-12	982'	RT	475'	400'	4'	T	Tree	No	No	Remove
30-13	1810'	LT	360'	396'	-5'	A	Tree	No	No	NA

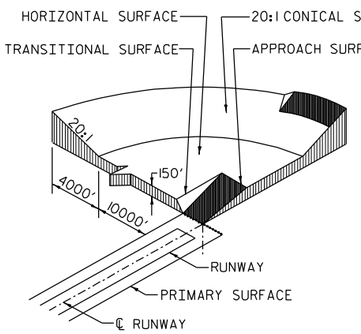
Total Acres = 4.894

Runway 1 Approach Surface
50:1 Approach Slope (with 1000' Runway Extension)

Obstruction Number	Dist. From RW	Offset from Centerline (LT or RT)	(Ft)	Higest Obstruction	Penetration Surface(Ft)	Surface	Object / Canopy Area (Acres)	Within RPZ	Within Wetland	Recommended Actions
1-1	-230	LT	730-820'	375'	10'	T	0.273	No	No	Remove
1-2	486'	LT	845-1110'	436'	57'	T	5.5	No	No	Remove
1-3	1030'	LT	770-1130'	419'	26'	T	3.1	No	No	Remove
1-4	1370'	LT	1085'	430'	25'	T	0.082	No	No	Remove
1-5	1909'	LT	820-900'	432'	76'	A	5	Yes	No	Remove
1-6	3130'	LT-RT	970LT-1100'RT	442'	61'	A	40	No	No	Remove [1]
1-7	1730'	RT	830'	379'	13'	T	0.057	No	0.057	Remove
1-8	1770'	RT	970'	379'	9'	T	0.103	No	0.068	Remove
1-9	2620'	RT	1165'	405'	-12'	T	0.02	No	No	Remove [3]
1-10	2825'	RT	1080'	404'	5'	T	Tree	No	No	Remove [3]
1-11	1740'	RT	1115'	402'	6'	T	0.114	No	No	Remove [3]
1-12	3160'	RT	920-1040'	416'	36'	AandT	0.183	No	No	Remove [3]
1-13	3300'	RT	740-860'	416'	32'	A	0.278	No	No	Remove [3]
1-14	3280'	RT	620-700'	426'	44'	A	0.091	No	No	Remove [3]
1-15	3430'	RT	700-740'	418'	31'	A	0.132	No	No	Remove [3]
1-16	4070'	RT	480-580'	423'	23'	A	0.119	No	No	Remove [3]
1-17	4490'	RT	570-740'	434'	26'	A	0.238	No	No	Remove
1-18	4090'	RT	165'	422'	23'	A	0.057	No	No	Remove
1-19	4000'	RT	200-370'	433'	33'	A	0.195	No	No	Remove
1-20	890'	RT	800'	372'	6'	T	0.067	No	0.067	Remove
1-21	810'	RT	700-920'	379'	16'	T	0.72	No	0.72	Remove
1-22	3110'	RT	400-440'	402'	23'	A	0.183	No	No	Remove [3]
1-23	3200'	RT	480'	397'	18'	A	Tree	No	No	Remove [3]
1-24	-315'	RT	580-670'	337'	-5'	T	0.21	No	No	Remove
1-25	1867'	LT	1039'	427'	31'	T	Tree	No	No	NA
1-26	1852'	LT	999'	437'	46'	T	Tree	No	No	NA
1-27	2181'	LT	1220'	419'	-2'	T	Tree	No	No	NA
1-28	2112'	LT	1277'	426'	0'	T	Tree	No	No	NA
1-29	1911'	LT	1307'	431'	-4'	T	Tree	No	No	NA
1-30	1590'	LT	918'	374'	-6'	T	Pole	No	No	NA
1-31	1609'	LT	1053'	427'	29'	T	Tree	No	No	NA
1-32	1434'	LT	1154'	418'	9'	T	Tree	No	No	NA
1-33	1757'	LT	900-970'	375'	-4'	T	Road (700')	No	No	Reconstruct
1-34	2390'	LT	1076'	397'	-3'	T	Tree	No	No	NA
1-35	2238'	LT	970-1060'	390'	-3'	T	0.5	No	No	NA
1-36	2141'	LT	1125-1170'	410'	-5'	T	0.1	No	No	NA
1-37	942'	LT	220-970'	358'	19'	AandT	Road (600')	Yes	No	NA [4]
1-38	788'	LT	310-780'	357'	24'	A	Terrain	Yes	No	Excavate
1-39	1893'	LT-RT	530LT-210'RT	373'	21'	A	Terrain	Yes	No	Excavate
1-40(est.)	3470'	LT-RT	510LT-200'RT	377'	10'	A	Terrain	Yes		Excavate
1-41(est.)	4200'	LT-RT	960LT-1090'RT	440'	38'	A	30	No		Remove
1-42(est.)	3780'	RT	980-1060'	440'	47'	A	0.7	No		Remove
1-43(est.)	4400'	LT-RT	1120LT-1180'RT	420'	14'	A	47	No		Remove

Total Acres = 134.88

NA = NO ACTION
1 = POWERS PARCEL TO BE ACQUIRED IN 2009
2 = FOREST ENTERPRISE FUTURE EASEMENT
3 = PORTION ON-AIRPORT OR UNDER AVIGATION EASEMENT HAS BEEN REMOVED
4 = AIRPORT ACCESS ROAD FOR LIGHTING SYSTEM



FAR PART 77 SURFACES

NOTES:

1. ALL OBSTRUCTIONS HAVE BEEN PLOTTED BUT FOR CLARITY NOT ALL ARE LABELED. FOR MORE INFORMATION REFER TO FLOYD BENNETT MEMORIAL AIRPORT OBSTRUCTION STUDY, COMPLETED BY C&S ENGINEERS, JULY 2001
2. THRESHOLD DISPLACEMENT IS NOT NECESSARY BECAUSE PENETRATIONS OF 20:1 AND 34:1 RUNWAY END SITING SURFACES HAVE BEEN OR WILL BE REMOVED EXCEPT FOR RUNWAYS 12 & 30 THAT ARE BEING MITIGATED BY PAPI'S SET ABOVE 3° TO CLEAR THE PENETRATIONS.

MAGNETIC NORTH 15°W (2005)
TRUE NORTH
2000 0 2000 4000FT.
2000'

NOTES

1. ALL ELEVATIONS SHOWN IN FEET ABOVE MEAN SEA LEVEL.
2. ESTABLISHED AIRPORT ELEVATION IS 328 FEET.
3. ALL CLOSE-IN OBSTRUCTIONS (TREES/BUSHES) SHOULD BE REMOVED OR TOPPED.
4. ALL MAN-MADE OBSTRUCTIONS IN HORIZONTAL AND CONICAL SURFACES SHOULD BE MARKED AND LIGHTED.
5. THIS PLAN WAS PREPARED FROM AVAILABLE PLANS OF RECORD AND OTHER UNDOCUMENTED SOURCES, AND IS NOT THE RESULT OF AN ACTUAL FIELD SURVEY.
6. OBJECTS MAY BE CONSIDERED OBSTRUCTIONS IF LOCATED WITHIN 10' OF FAR PART 77 SURFACES OR WITHIN THE RPZ.
7. OBSTRUCTION NUMBERING IS CONSISTENT WITH OBSTRUCTION STUDY FOR FLOYD BENNETT MEMORIAL AIRPORT, JULY 2001, BY C&S ENGINEERS, INC.

LEGEND

PAVED RUNWAY	
OBSTRUCTION (RUNWAY 1-19)	1-5 19-5
OBSTRUCTION (RUNWAY 12-30)	12-5 30-5
FAR PART 77 SURFACES	
NON CRITICAL LIMITS OF FAR PART 77 SURFACES	

REVISIONS

BY	DATE	CHANGE

FIGURE 7-2
FLOYD BENNETT MEMORIAL AIRPORT
QUEENSBURY, NEW YORK — WARREN COUNTY

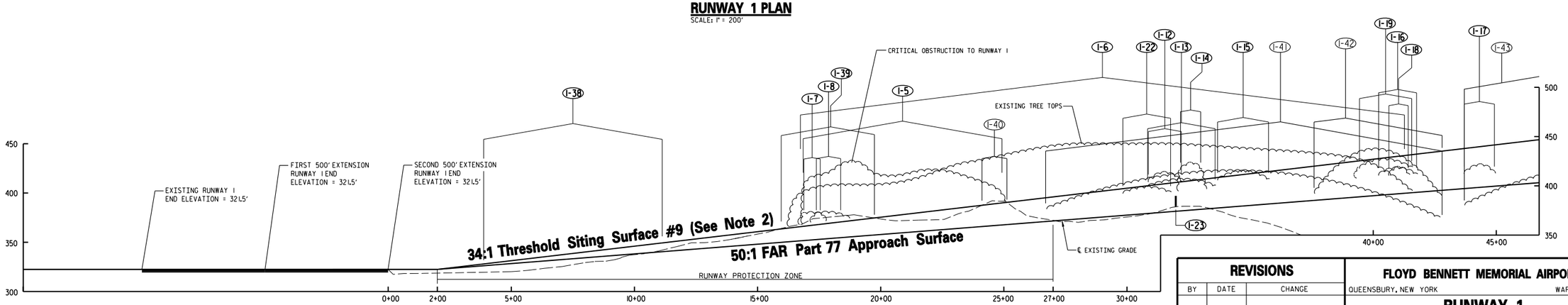
AIRPORT AIRSPACE & OBSTRUCTION DATA

DESIGNED: JCT	DRAWN: JCT	SHEET 5 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: I629AP09.DGN	

C&S COMPANIES

RUNWAY 1 PLAN

SCALE: 1" = 200'



RUNWAY 1 PROFILE

SCALE: 1" = 200' HORIZONTAL
SCALE: 1" = 50' VERTICAL

NOTE:

REFER TO OBSTRUCTION DATA TABLES ON SHEET 5 OF 10 FOR DETAILED INFORMATION AND RECOMMENDED ACTIONS FOR IDENTIFIED OBSTRUCTIONS.

50' 50 0 50 100FT.

200' 200 0 200 400FT.

REVISIONS		
BY	DATE	CHANGE

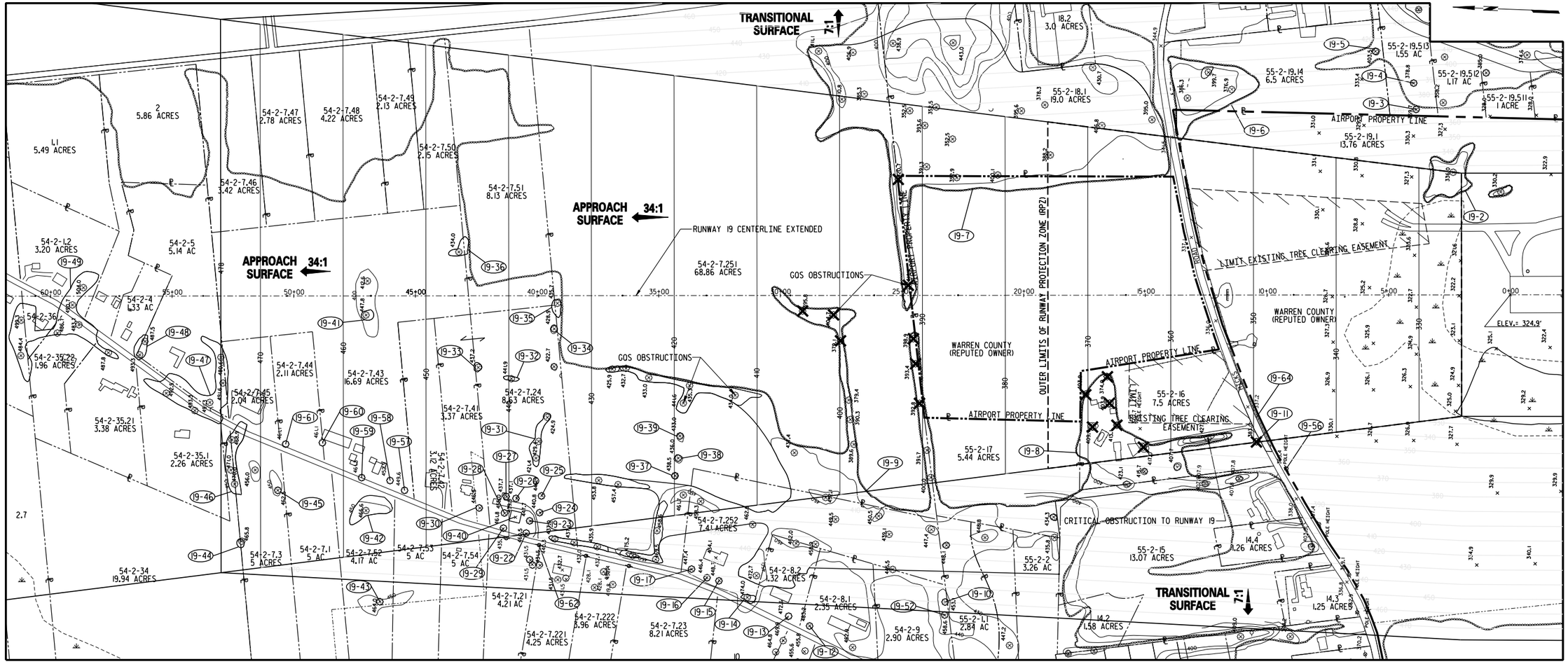
FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

RUNWAY 1 APPROACH PLAN & PROFILE

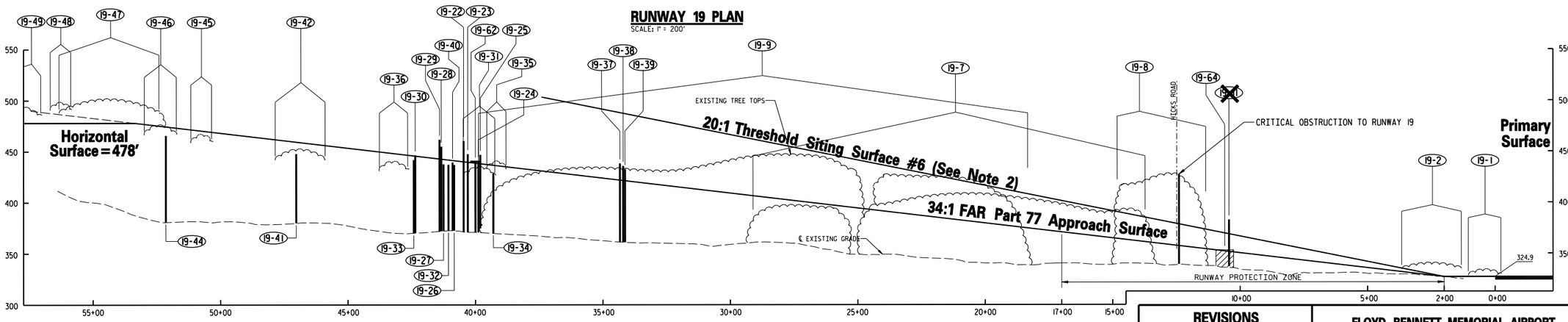
DESIGNED: JCT	DRAWN: JCT	SHEET 6 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP13.DGN	

CS CLOUGH, HARBOUR & ASSOCIATES



RUNWAY 19 PLAN

SCALE: 1" = 200'



RUNWAY 19 PROFILE

SCALE: 1" = 200' HORIZONTAL
SCALE: 1" = 50' VERTICAL

NOTES:

1. REFER TO OBSTRUCTION DATA TABLES ON SHEET 5 OF 10 FOR DETAILED INFORMATION AND RECOMMENDED ACTIONS FOR IDENTIFIED OBSTRUCTIONS.
2. ✕ = OBSTRUCTIONS REMOVED

50' 50 0 50 100FT.

200' 200 0 200 400FT.

REVISIONS		
BY	DATE	CHANGE

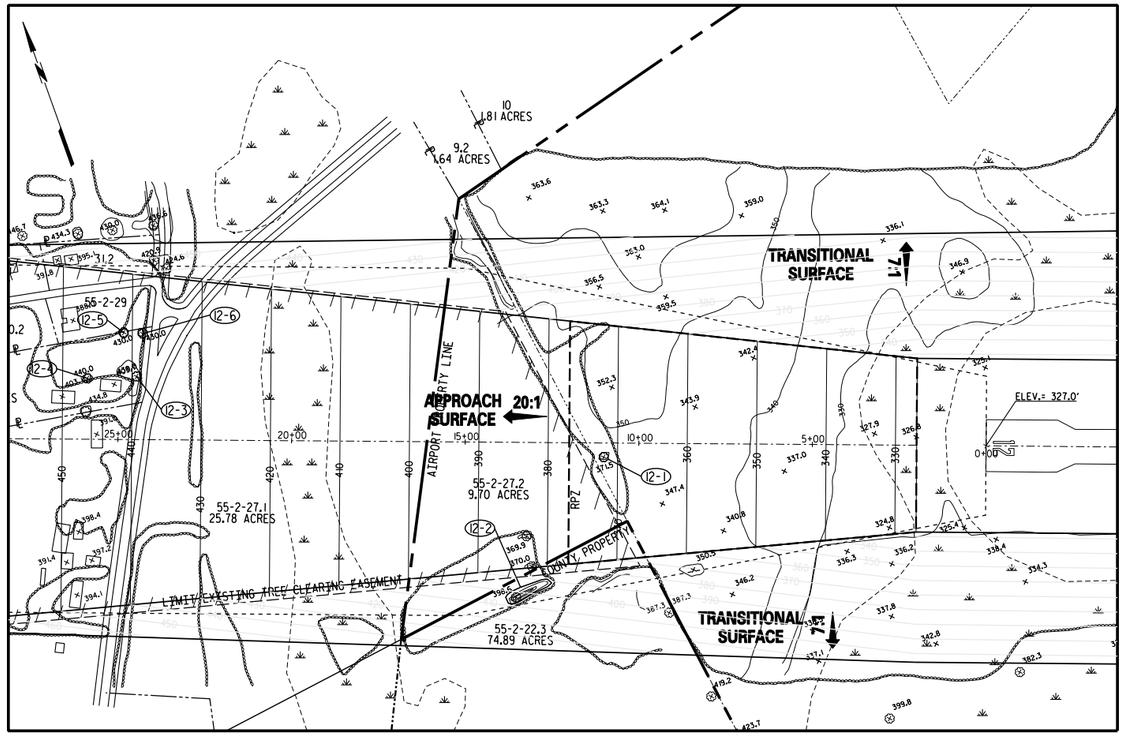
FLOYD BENNETT MEMORIAL AIRPORT

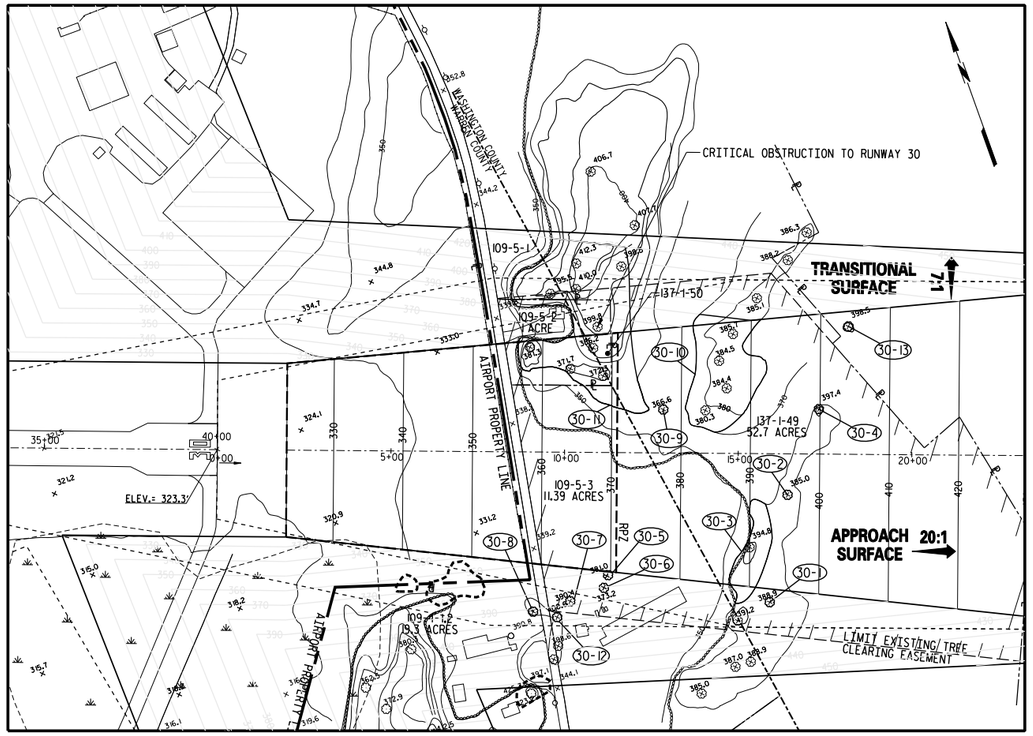
QUEENSBURY, NEW YORK — WARREN COUNTY

RUNWAY 19 APPROACH PLAN & PROFILE

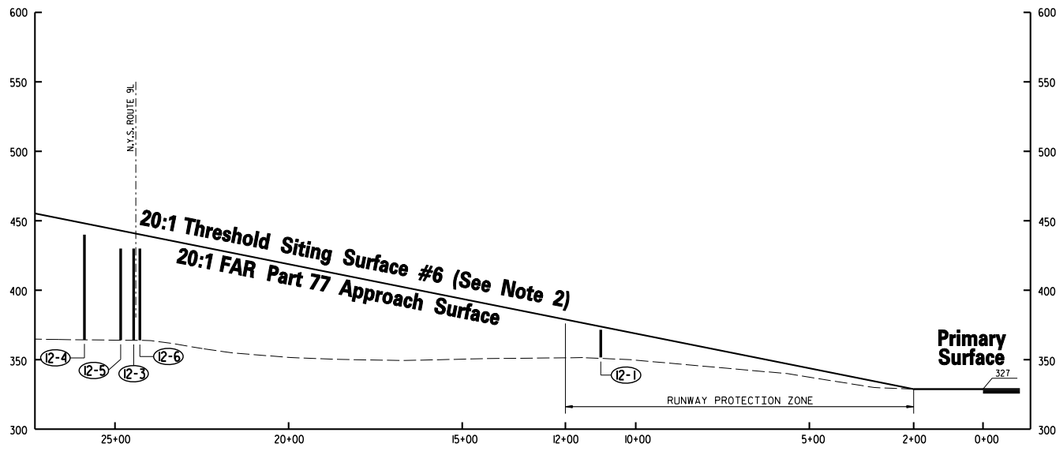
DESIGNED: JCT	DRAWN: JCT	SHEET 7 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP14.DGN	

CS Consultants



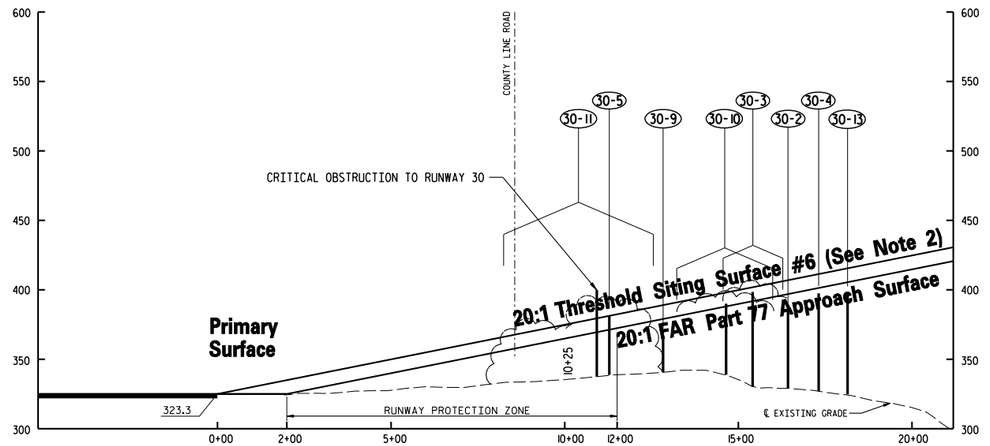


RUNWAY 12 PLAN
SCALE: 1" = 200'



RUNWAY 12 PROFILE
SCALE: 1" = 200' HORIZONTAL
SCALE: 1" = 50' VERTICAL

RUNWAY 30 PLAN
SCALE: 1" = 200'



RUNWAY 30 PROFILE
SCALE: 1" = 200' HORIZONTAL
SCALE: 1" = 50' VERTICAL

NOTES:

1. REFER TO OBSTRUCTION DATA TABLES ON SHEET 5 OF 10 FOR DETAILED INFORMATION AND RECOMMENDED ACTIONS FOR IDENTIFIED OBSTRUCTIONS.
2. TO AVOID OBSTRUCTIONS TO TSS, PAPI'S WILL BE DESIGNED TO CREATE A GLIDE ANGLE OVER FIXED OBSTRUCTIONS.

50' 50 0 50 100FT.

200' 200 0 200 400FT.

REVISIONS		
BY	DATE	CHANGE

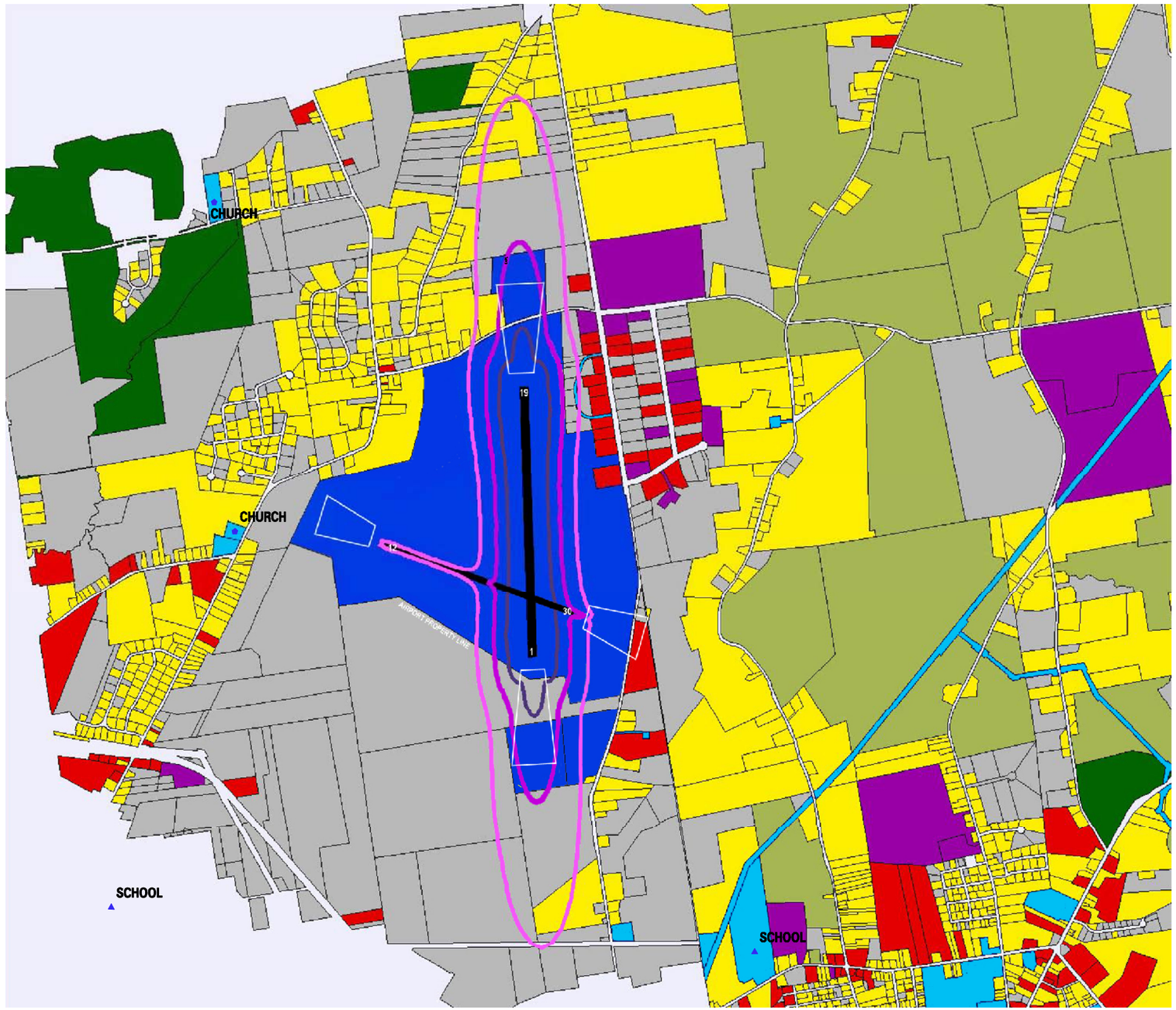
FLOYD BENNETT MEMORIAL AIRPORT
QUEENSBURY, NEW YORK — WARREN COUNTY

RUNWAY 12-30 APPROACH PLANS & PROFILES

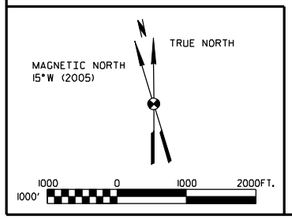
WARREN COUNTY

DESIGNED: JCT	DRAWN: JCT	SHEET 8 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP15.DGN	

C S COMPANIES



SOURCE: WARREN COUNTY PLANNING DEPARTMENT, 2002



REVISIONS		
BY	DATE	CHANGE

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

LAND USE PLAN

DESIGNED: JCT	DRAWN: JCT	SHEET 9 OF 10
CHECKED: CRM, KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP11.DGN	

C S COMPANIES

PLANNED LAND ACQUISITION TABLE			
PARCEL NO.	GRANTOR	ACREAGE	FUNDING SOURCE
1	COUNTY OF WARREN	517	
2	LEO POWERS	25	AIP

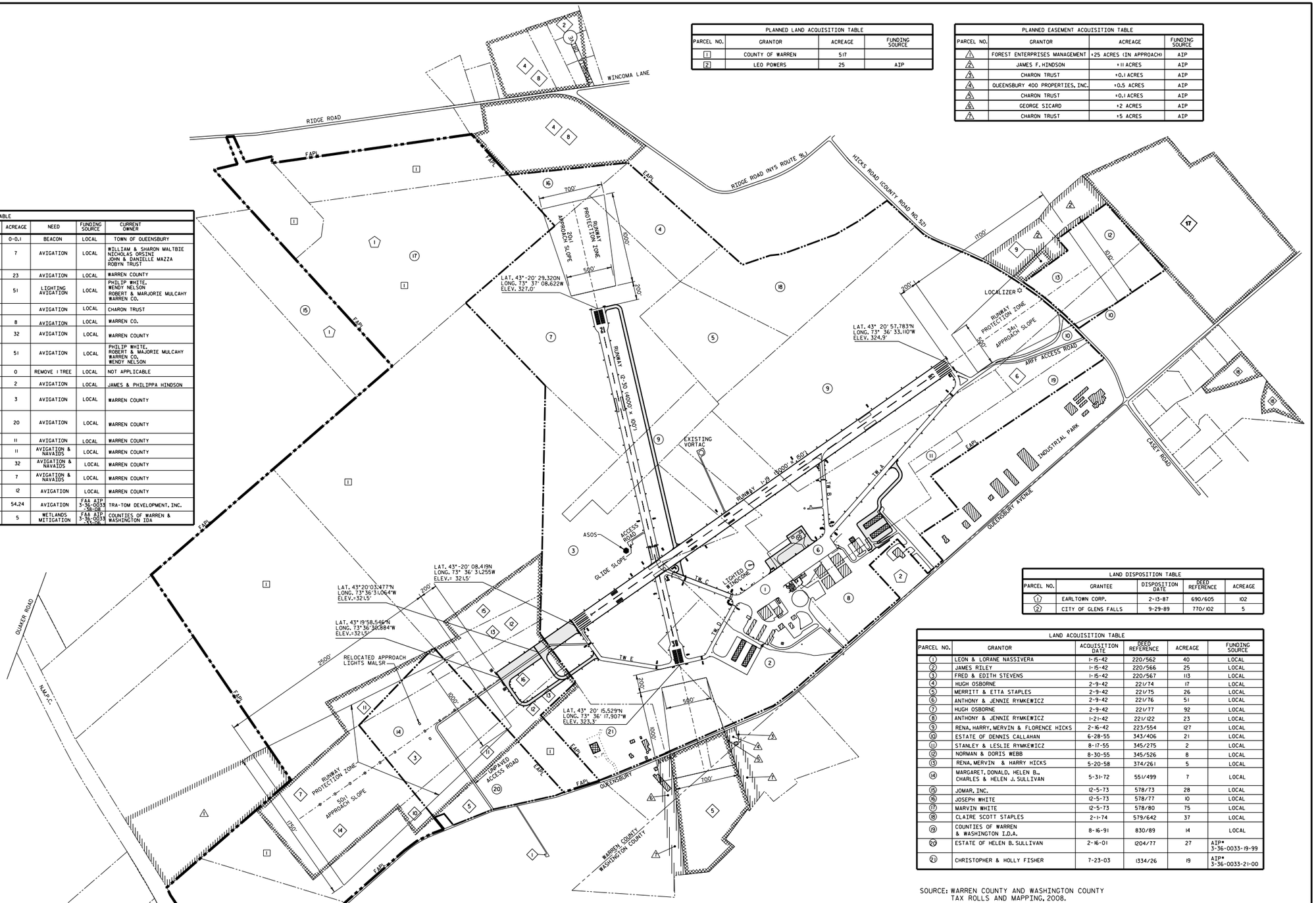
PLANNED EASEMENT ACQUISITION TABLE			
PARCEL NO.	GRANTOR	ACREAGE	FUNDING SOURCE
1	FOREST ENTERPRISES MANAGEMENT	±25 ACRES (IN APPROACH)	AIP
2	JAMES F. HINDSON	±11 ACRES	AIP
3	CHARON TRUST	±0.1 ACRES	AIP
4	QUEENSBURY 400 PROPERTIES, INC.	±0.5 ACRES	AIP
5	CHARON TRUST	±0.1 ACRES	AIP
6	GEORGE SICARD	±2 ACRES	AIP
7	CHARON TRUST	±5 ACRES	AIP

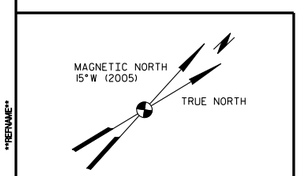
EASEMENT TABLE							
PARCEL NO.	GRANTOR	ACQUISITION DATE	DEED REFERENCE	ACREAGE	NEED	FUNDING SOURCE	CURRENT OWNER
1	JOHN NASSIVERA	7-1-42	222/195	0-0.1	BEACON	LOCAL	TOWN OF QUEENSBURY
2	MARY DOBRINDT	9-30-43	225/570	7	AVIGATION	LOCAL	WILLIAM & SHARON MALTBIE NICHOLAS ORSINI JOHN & DANIELLE MAZZA ROBYN TRUST
3	PATRICK MARGARET & JOHN SULLIVAN	9-30-43	225/570	23	AVIGATION	LOCAL	WARREN COUNTY
4	NORMAN K. CALKINS	9-30-43	225/572	51	LIGHTING AVIGATION	LOCAL	PHILIP WHITE, WENDY NELSON ROBERT & MARJORIE MULCAHY WARREN CO.
5	JAMES I. RILEY	6-8-44	228/225		AVIGATION	LOCAL	CHARON TRUST
6	ESTATE OF DENNIS CALLAHAN	6-19-44	228/302	8	AVIGATION	LOCAL	WARREN CO.
7	FRANK J. GUERIN, AGNES J. FLEMING, ANNA G. HOWELL, CLARA UHL, MABLE O'ROURKE	6-19-44	228/309	32	AVIGATION	LOCAL	WARREN COUNTY
8	NORMAN L. CALKINS	8-17-44	229/130	51	AVIGATION	LOCAL	PHILIP WHITE, ROBERT & MAJORIE MULCAHY WARREN CO. WENDY NELSON
	PATRICK H. BREEN	4-2-45	251/468	0	REMOVE 1 TREE	LOCAL	NOT APPLICABLE
9	RENA, MERVIN & HARRY HICKS	5-20-58	374/261	2	AVIGATION	LOCAL	JAMES & PHILIPPA HINDSON
10	MABEL GUERIN O'ROURKE, CLAIR GUERIN UHL, ANNA GUERIN HOWELL & AGNES GUERIN FLEMING	5-17-66	468/345	3	AVIGATION	LOCAL	WARREN COUNTY
11	MARGARET, DONALD, HELEN B., CHARLES & HELEN J. SULLIVAN	6-30-66	470/292	20	AVIGATION	LOCAL	WARREN COUNTY
12	WILLIAM & CLARA ARONSON	7-7-66	470/403	11	AVIGATION	LOCAL	WARREN COUNTY
13	TORRINGTON CONSTRUCTION CO., INC.	4-10-72	549/368	11	AVIGATION & NAVAIDS	LOCAL	WARREN COUNTY
14	TORRINGTON CONSTRUCTION CO., INC.	4-10-72	549/371	32	AVIGATION & NAVAIDS	LOCAL	WARREN COUNTY
15	TORRINGTON CONSTRUCTION CO., INC.	4-10-72	549/374	7	AVIGATION & NAVAIDS	LOCAL	WARREN COUNTY
16	TORRINGTON CONSTRUCTION CO., INC.	5-31-72	551/501	12	AVIGATION	LOCAL	WARREN COUNTY
17	TRA-TOM DEVELOPMENT, INC.	11-28-06	3124/176	54.24	AVIGATION	FAA AIP 3-36-0033-18-08	TRA-TOM DEVELOPMENT, INC.
18	COUNTIES OF WARREN & WASHINGTON IDA	XX-XX-XX	XXX/XXX	5	WETLANDS MITIGATION	FAA AIP 3-36-0033-XX-06	COUNTIES OF WARREN & WASHINGTON IDA

LAND DISPOSITION TABLE				
PARCEL NO.	GRANTEE	DISPOSITION DATE	DEED REFERENCE	ACREAGE
1	EARLTOWN CORP.	2-13-87	690/605	102
2	CITY OF GLENS FALLS	9-29-89	770/102	5

LAND ACQUISITION TABLE					
PARCEL NO.	GRANTOR	ACQUISITION DATE	DEED REFERENCE	ACREAGE	FUNDING SOURCE
1	LEON & LORANE NASSIVERA	1-15-42	220/562	40	LOCAL
2	JAMES RILEY	1-15-42	220/566	25	LOCAL
3	FRED & EDITH STEVENS	1-15-42	220/567	113	LOCAL
4	HUGH OSBORNE	2-9-42	221/74	17	LOCAL
5	MERRITT & ETTA STAPLES	2-9-42	221/75	26	LOCAL
6	ANTHONY & JENNIE RYMKEWICZ	2-9-42	221/76	51	LOCAL
7	HUGH OSBORNE	2-9-42	221/77	92	LOCAL
8	ANTHONY & JENNIE RYMKEWICZ	1-21-42	221/122	23	LOCAL
9	RENA, HARRY, MERVIN & FLORENCE HICKS	2-16-42	223/554	127	LOCAL
10	ESTATE OF DENNIS CALLAHAN	6-28-55	343/406	21	LOCAL
11	STANLEY & LESLIE RYMKEWICZ	8-17-55	345/275	2	LOCAL
12	NORMAN & DORIS WEBB	8-30-55	345/526	8	LOCAL
13	RENA, MERVIN & HARRY HICKS	5-20-58	374/261	5	LOCAL
14	MARGARET, DONALD, HELEN B., CHARLES & HELEN J. SULLIVAN	5-31-72	551/499	7	LOCAL
15	JOMAR, INC.	12-5-73	578/73	28	LOCAL
16	JOSEPH WHITE	12-5-73	578/77	10	LOCAL
17	MARVIN WHITE	12-5-73	578/80	75	LOCAL
18	CLAIRE SCOTT STAPLES	2-1-74	579/642	37	LOCAL
19	COUNTIES OF WARREN & WASHINGTON I.D.A.	8-16-91	830/89	14	LOCAL
20	ESTATE OF HELEN B. SULLIVAN	2-16-01	1204/77	27	AIP* 3-36-0033-19-99
21	CHRISTOPHER & HOLLY FISHER	7-23-03	1334/26	19	AIP* 3-36-0033-21-00

SOURCE: WARREN COUNTY AND WASHINGTON COUNTY TAX ROLLS AND MAPPING, 2008.





BENAME

LEGEND

EXISTING BUILDING	
PROPOSED BUILDING	
PARCEL LINE	
EXISTING AIRPORT PROPERTY LINE	FAPL
FUTURE AIRPORT PROPERTY LINE	FAPL
EXISTING EASEMENT LIMIT	
PROPOSED EASEMENT LIMIT	
FUTURE AIRPORT DEVELOPMENT	

REVISIONS

SYM	DATE	CHANGE

FLOYD BENNETT MEMORIAL AIRPORT

QUEENSBURY, NEW YORK — WARREN COUNTY

AIRPORT PROPERTY MAP

DESIGNED: LCB, JCT	DRAWN: LCB, JCT	SHEET 10 OF 10
CHECKED: KCK	DATE: JUNE 2009	
PROJECT FILE NO.: 107.016.001	CADD FILE NO.: 1629AP01.DGN	

C S COMPANIES

F:\Project\107 - Warren County\10701601\cadd\10701601\1629ap01(updated).dgn

Chapter 8 - Financial Plan

8.01 General

This chapter presents a financial plan to support capital improvement decisions and to serve as a guide for orderly development of Floyd Bennett Memorial Airport. It identifies capital improvement projects, their sequencing, and the possible financial obligations to be assumed by the federal and state government, and the airport sponsor (Warren County). The objective of this financial analysis is to identify the most likely plan for funding capital improvement projects to the year 2020.

8.02 Capital Improvements

The proposed schedule of capital improvements is presented in Tables 8-1 through 8-4. The tables describe, by phase, the investment required for airport improvements, as shown on the Airport Layout Plan (Sheet 3 of 10). In addition, the proposed airport improvement projects were based on input from the Floyd Bennett Memorial Airport Advisory Committee and comments from local, state and federal representatives. Project costs were based on unit costs developed by the consultant from experience at other airports of similar size in New York and elsewhere. For comparative purposes, the estimated costs of capital improvements are stated in 2001 dollars. Therefore, these costs should be considered as foundation planning costs that will likely have to be adjusted regularly to arrive at actual project costs. In most cases, the actual project costs and corresponding budgeted amounts will be greater, to account for varying economic conditions.

The Capital Improvement Program (CIP) is presented in three phases. Phase 1 (2001-2005), Phase 2 (2006-2010), and Phase 3 (2011-2020) are divided into federal, state, private investors and sponsor portions. A majority of the airport improvement projects qualify for Federal Aviation Administration/Airport Improvement Program (AIP) and New York Department of Transportation funding. **Based on current legislation**, AIP approved projects are eligible for 90 percent funding. The state of New York is anticipated to fund an additional 5 percent of eligible project costs. The remaining 5 percent of eligible project costs are to be financed by the airport sponsor (Warren County). Total investment (i.e., federal/state/sponsor) is estimated to be $16,160,300 to the year 2020.

Table 8-5 provides a historical summary for the years 1991-2001 of airport capital improvements for which Federal and State funding was provided. During this 11-year period, projects with a total value of $8.9 million have been funded, with the Counties share estimated at $446,000, or 5%, of the total funded improvements. Based upon historical funding, and assuming Federal and State funding of airports continues, the capital projects recommended by the plan are realistic.

8.03 Financing Capital Improvements

The total expected airport improvement costs associated with the implementation of the development program are presented in Tables 8-1 through 8-4. However, the portions of those development costs that must be funded by the airport owner are of a more immediate concern to the implementation of the master plan.

For a majority of airport development projects, airport sponsors are eligible for federal financial assistance through the Airport Improvement Program (AIP).

The funds for the AIP are distributed in accordance with provisions contained in the Airport and Airway Improvement Act (the Act). The Airport and Airway Trust Fund, which was established by the Act, provides the revenue used to fund AIP projects.

TABLE 8-1
CAPITAL IMPROVEMENT PROGRAM (2001 DOLLARS)
PHASE 1, 2001 – 2005

Phase 1	Project	Total Cost	Federal Eligible	State Eligible	Sponsor
1-1	Construct 500' extension to Runway 1	$1,500,000	$1,350,000	$75,000	**$75,000**
1-2	Construct T-hangars	$980,000			**$980,000**
1-3	Refurbish existing conventional hangar	$200,000			**$200,000**
1-4	Construct based/itinerant apron	$780,000	$702,000	$39,000	**$39,000**
1-5	Construct new maintenance/sand storage bldg.	$900,000	$810,000	$45,000	**$45,000**
1-6	Construct overflow aircraft parking area	$600,000	$540,000	$30,000	**$30,000**
1-7	Install security entry fence	$805,000	$724,500	$40,250	**$40,250**
1-8	Rehabilitation lighting RW's 1-19, 12-30; and install REILS	$733,500	$660,150	$36,675	**$36,675**
1-9	Stormwater pollution prevention plan	$10,800	$9,720	$540	**$540**
1-10	RW 12-30 RSA improvements and crack sealing	$360,000	$324,000	$18,000	**$18,000**
1-11	Purchase snow removal equipment	$75,000	$67,500	$3,750	**$3,750**
1-12	Install runway surface sensor	$182,000	$163,800	$9,100	**$9,100**
1-13	Rehabilitate Taxiways B, D and E	$594,000	$534,600	$29,700	**$29,700**
1-14	Runway 1-19 off-airport obstruction removal	$682,000	$613,800	$34,100	**$34,100**
1-15	RW 1 safety area improvements	$1,100,000	$990,000	$55,000	**$55,000**
1-16	Runway 12-30 off-airport obstruction removal	$63,000	$56,700	$3,150	**$3,150**
1-17	Install sanitary sewer line	$100,000			**$100,000**
1-17	Conduct EA for MP projects	$90,000	$81,000	$4,500	**$4,500**
	TOTAL	**$9,665,300**	**$7,627,770**	**$423,765**	**$1,703,765**

Source: C&S Engineers, Inc.

TABLE 8-2
CAPITAL IMPROVEMENT PROGRAM (2001 DOLLARS)
PHASE 2, 2006-2010

Phase 2	Project	Total Cost	Federal Eligible	State Eligible	Sponsor
2-1	Construct parallel taxiway on Runway 12-30	$1,500,000	$1,350,000	$75,000	**$75,000**
2-2	Construct helipad	$375,000	$337,500	$18,750	**$18,750**
2-3	Rehabilitate Runway 12-30	$1,377,000	$1,239,300	$68,850	**$68,850**
2-4	Rehabilitate pavement on airport access road	$175,000	$157,500	$8,750	**$8,750**
	TOTAL	**$3,427,000**	**$3,084,300**	**$171,350**	**$171,350**

Source: C&S Engineers, Inc.

TABLE 8-3
CAPITAL IMPROVEMENT PROGRAM (2001 DOLLARS)
PHASE 3, 2011-2020

Phase 3	Project	Total Cost	Federal Eligible	State Eligible	Sponsor
3-1	Construct 500-foot extension on Runway 1 (Phase 2)	$1,500,000	$1,350,000	$75,000	**$75,000**
3-2	Construct conventional hangar	$1,500,000			**$1,500,000**
3-3	Construct taxiway access to industrial/aviation park	$300,000	$270,000	$15,000	**$15,000**
3-4	Install PAPIs on Runways 1-19 and 12-30	$240,000	$216,000	$12,000	**$12,000**
	TOTAL	**$3,540,000**	**$1,836,000**	**$102,000**	**$1,602,000**

Source: C&S Engineers, Inc.

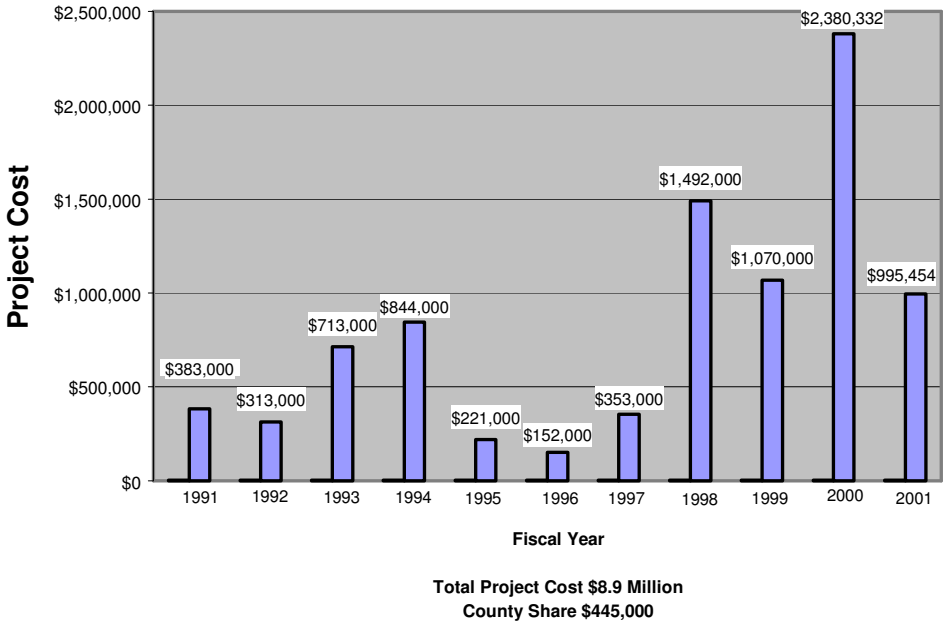
TABLE 8-4
CAPITAL IMPROVEMENT PROGRAM (2001 DOLLARS)
SUMMARY

	Total Cost	Federal Eligible	State Eligible	Sponsor
Phase 1 (2001 - 2005)	$9,193,300	$7,211,970	$400,665	**$1,580,665**
Phase 2 (2006 - 2010)	$3,427,000	$3,084,300	$171,350	**$171,350**
Phase 3 (2011 - 2020)	$3,540,000	$1,836,000	$102,000	**$1,602,000**
Total	**$16,160,300**	**$12,132,270**	**$674,015**	**$3,354,015**

Source: C&S Engineers, Inc.

With the existing federal and state airport development programs in mind, the anticipated local sharing of development costs, for the next twenty years, is outlined in Table 8-4. In 2001 dollars, the federal and state shares are projected to total $12,132,270 (or an average of $606,600 per year) and $674,015 (average of $33,700 per year) respectively, to the year 2020. The airport sponsor (i.e., Warren County) share of capital projects is projected at $3,354,015 (average of $167,700 per year) for the planning period.

TABLE 8-5
HISTORICAL FUNDING



In June 2009, the CIP through the year 2020 was updated to reflect remaining projects to be completed in the 20-year plan for the airport; costs are updated and expressed in 2009 dollars. Table 8-6 summarizes the updated CIP and current project development costs.

TABLE 8-6
CAPITAL IMPROVEMENT PROGRAM (2009 DOLLARS)
UPDATED SUMMARY

Project No.	Project	Total Cost	Federal Eligible	State Eligible	Sponsor
1-1	Construct 500' extension to Runway 1	$2,500,000	$2,250,000	$125,000	$125,000
1-2	Construct T-Hangars (42 bays)	$3,240,000			$3,240,000
1-3	Refurbish existing conventional hangar	$250,000			$250,000
1-5	Construct new maintenance/sand storage bldg.	$1,500,000	$1,350,000	$75,000	$75,000
1-6	Construct overflow aircraft parking area	$1,000,000	$900,000	$50,000	$50,000
1-11	Purchase snow removal equipment	$450,000	$405,000	$22,500	$22,500
1-12	Install runway surface sensor	$200,000	$180,000	$10,000	$10,000
1-14	Runway 1-19 off-airport obstruction removal	$750,000	$675,000	$37,500	$37,500
1-16	Runway 12-30 off-airport obstruction removal	$250,000	$225,000	$12,500	$12,500
1-18	Conduct EA for MP projects	$350,000	$315,000	$17,500	$17,500
2-1	Construct parallel taxiway on Runway 12-30	$2,500,000	$2,250,000	$125,000	$125,000
2-2	Construct helipad	$400,000	$360,000	$20,000	$20,000
2-4	Rehabilitate pavement on airport access road	$500,000	$450,000	$25,000	$25,000
3-1	Construct 500-foot extension on Runway 1 (Phase 2)	$2,500,000	$2,250,000	$125,000	$125,000
3-3	Construct taxiway access to industrial/aviation park	$300,000	$270,000	$15,000	$15,000
3-4	Install PAPIs on Runway 12-30	$200,000	$180,000	$10,000	$10,000
	TOTAL	**$16,890,000**	**$12,060,000**	**$670,000**	**$4,160,000**

Source: C&S Engineers, Inc.

8.04 Rates and Charges Comparison

In order to provide the sponsor portion of the capital projects outlined in this chapter, Warren County may want to consider ways in which to increase revenue generated at the airport.

With the exception of periodic state funding, revenue producing capital projects such as T-hangars are not eligible for funding. Two projects proposed as part of the capital program for the 2001-2005 time frame fall into the non-eligible category. These projects are the construction of T-hangars estimated at $980,000 and the refurbishment of the existing conventional hangar estimated at $200,000.

Table 8-7 provides an analysis of the unit cost for constructing 28 T-hangar units as proposed by this plan. The analysis compares unit costs including construction and interest at 4%, 5% and 6% amortized over a 15-year period. As indicated, the annual cost to the County per unit ranges from $2,477 to $2,553. Currently new hangars at the airport lease for $250 monthly or $3,000 annually. Although T-hangars require very little maintenance, a 15% markup to the unit cost for administration and maintenance brings the unit cost including the 6% finance rate to $2,936 per year, which based on current unit rents for new hangars would be covered by rental income.

TABLE 8-7
T-HANGAR COST ANALYSIS

T-Hangar Cost	Annual Cost 15-Year Amortization			Annual Rental Rate Per Hangar to Cover Debt
	4%	5%	6%	
$980,000 ($35,000 per unit)	$69,376	$70,424	$71,489	4% - $2,477.70 5% - $2,515.16 6% - $2,553.18

Source: C&S Engineers, Inc.

Obvious variables that can impact this analysis and the potential success of the project include project cost, occupancy rate and rental rates. Hangar rental rates vary across the state. However, a survey, indicates that rental rates for hangars could be increased. Six airports, located throughout New York, were contacted. The airports surveyed are similar to Floyd Bennett Memorial Airport in runway length, number of annual operations and number of based aircraft, as reported on FAA Airport Master Record Form 5010. The rates and fees presently being charged for T-hangars and tie-downs at Floyd Bennett Memorial Airport are below the range of charges at comparable airports. Of the airports surveyed, tie-down prices range from $30 to $120 per month and hangar space can range from $150 to $375 per month. The possibility for increasing hangar rates seems to be a viable option.

Some suggested methods to mitigate the County's risk include:

- Tenants sign agreements prior to construction.
- Lease escalation clauses that reflect an appropriate CPI index, or actual increase in airport expenses could be included in lease agreements.
- Private development of T-hangars is an option. Niagara Falls and Syracuse both have land leases for the development of T-hangars. These land leases usually contain escalator and revisionary clauses.

With regard to the $200,000 investment to renovate the existing freestanding hangar, it is recommended that negotiations with the FBO be conducted to help offset this expenditure. This improvement as well as the construction of new T-hangars will benefit the FBO, and there should be an economic basis for the investment.

A review of the FBO agreement indicates that the County only shares in certain facets of the revenue generated from FBO services. While there is a minimum guarantee rental of $25,000 per year, perhaps a contract without a minimum guarantee, but a better split of all the revenue makes more economic sense.

It is recommended that the County develop an airport business plan with defined economic goals that are quantifiable and related to the cost of operating the airport, as well as, the indirect economic benefits to the community.

8.05 Conclusions

This chapter has laid out the recommended capital projects and their financial implications for improving Floyd Bennett Memorial Airport on a development schedule outlined to the year 2020.

This Airport Master Plan has documented the existing aviation need for a general aviation service airport in the Warren County area based on existing conditions, business and user surveys (see Appendix D), and informed local and technical opinions, as expressed through the study's Airport Advisory Committee. From today to the year 2020, the continued development of the airport could be influenced by many factors, yet the most basic question remains, **"What is the value of the airport to the Warren County area, and why does the community continue to need to support it?"**

For the community, the value of the airport rests in the community's expectations and vision for the future. In a dynamic economy, one that is growing and developing, aviation can provide a community with one additional asset to assist development, or keep businesses in place. To make the airport "better" entails making it safer, capable of being used year-round under differing weather conditions, and providing services for the air traveler, aircraft storage, maintenance, repair, and refueling. It also means providing an adequate runway system with respect to its length, width, and pavement condition for the types of aircraft that use it. During the development phases of the airport, new circumstances may arise that could affect the development of the airport either by accelerating development or postponing it. Generally, the pace of the economy and the general aviation industry itself serve as barometers for the pace of aviation demand and growth.

It is sometimes difficult to show the economic benefits of an airport; however, some points can be made based on studies done in New York and the rest of the country. **It is a fact that small, medium, and large businesses do use airports in many ways.** For attracting new businesses into the area, an airport is an important asset if the target firms that are considering the Warren County area are large ones, or firms with other aeronautical needs.

The other major benefit of an airport is its reflection of the community's attitude toward the future. To support an airport reflects a commitment on the part of a community to grow, develop, and meet its economic needs of the future. Many communities feel their airports are a vital piece of infrastructure that has helped them to attract new businesses, allow existing businesses to grow, and keep other businesses from shutting their doors, losing jobs, tax

revenues and disrupting the community. Each community makes its own choice. The demand for aviation is either satisfied, shifted to another airport, or alternative means of transport are found. In all these situations, benefits and costs to aviation users are traded with other community priorities and needs.

During the review of this Master Plan, the Airport Advisory Committee evaluated the need and role of the airport in terms of the demand for aviation services. This plan reflects the commitment on the part of Warren County to support and to improve the airport and maintain its economic benefits to its aviation users and the community.

APPENDIX A

AIRPORT ADVISORY COMMITTEE

ADVISORY COMMITTEE

Chandler Atkins
PO Box 95
Lake Luzerne, NY 12846

William Bingham
15 Charles Street
South Glens Fall, NY 12803

Nicolas A. Caimano
36 Surrey Field Road
Queensbury, NY 12804

Rebecca Marino
104 Sunnyside Drive
Queensbury, NY 12804

Gail Solomon
238 Chestnut Ridge Road
Queensbury, NY 12804

George Thurston
44 Meadowview Road
Queensbury, NY 12804

Scott Sopczk
A/GFTC
Washington County Municipal Center
Room A-204
Ft. Edward, NY 12828

Matt Catone
Empire East Aviation, Inc.
439 Queensbury Avenue
Queensbury, NY 12804

Jennifer L. Dermody
Federal Aviation Administration
600 Old Country Road, Suite 446
Garden City, NY 11530

Robert J. Lenuzza
Federal Aviation Administration
600 Old Country Road, Suite 446
NY Airports District Office
Garden City, NY 11530

Marshall B. Stevens, CM
Floyd Bennett Memorial Airport
Room 201
443 Queensbury Ave.
Queensbury, NY 12804

Lorrin Bird
NYS Department of Transportation
Aviation Bureau State Office Campus Bldg.
1220 Washington Avenue
Albany, NY 12232

John Kelly
NYS Dept. of Environmental Conservation
232 Hudson St., PO Box 220
Warrensburg, NY 12885

Chris Round
Queensbury Planning Office
742 Bay Road
Queensbury, NY 12804

William L. Remington, PE
Warren County
Department of Public Works
4028 Main Street
Warrensburg, NY 12885

Len Fosbrook
Warren County EDC
234 Glen St.
Glens Falls, NY 12801

Patricia A. Tatich
Warren County Planning
1340 State Route 9
Lake George, NY 12845

Willy F. Grimmke, PE
Washington County
Dept. of Public Works
383 Upper Broadway
Fort Edward, NY 12828

Louis E. Tessier
34 Hubbell Lane
Lake George, NY 12845

APPENDIX B

NEIGHBORING AIRPORTS

APPENDIX B
NEIGHBORING AIRPORTS

Airport	Identifier	Use	Dimensions	Location (to airport)
Argyle	1C3	Public	2400'x100' (turf)	8.0 nm SE
Shaw Field	7NY8	Private	1200'x40' (dirt/turf)	9.0 nm S
Heber Airpark	K30	Public	2200'x24' (asphalt)	9.5 nm S
Russell Field	0NY1	Private	1360'x125' (turf)	12.3 nm S
Granville	B01	Public	2500'x36' (asphalt)	16.0 nm ENE
Garnseys	B04	Public	2600'x103' (turf)	16.0 nm S
Hulett Landing Strip	VT60	Private	1125'x75' (turf)	16.1 nm E
Mach Personal Strip	VT20	Private	1750'x75' (turf)	20.2 nm E
Chapin Field	1B8	Public	2100'x71' (turf) 2200'x80' (turf)	20.5 nm SSE
Saratoga County	5B2	Public	4000'x100' (asphalt/concrete) 4700'x100' (asphalt/concrete)	20.6 nm SSW
Fair Haven Municipal	1B3	Public	2070'x50' (turf/gravel)	22.0 nm NE
Plateau Sky Ranch	1F2	Public	2000'x100' (turf) 2400'x100' (turf)	23.1 nm WSW

Source: AirNav Airport Search (2/24/00)

APPENDIX C

GLOSSARY OF TERMS

APPENDIX C
GLOSSARY AND ABBREVIATIONS

-A-

A-WEIGHTED SOUND LEVEL - The sound pressure level which has been filtered or weighted to reduce the influence of low and high frequency (dBA).

AIRCRAFT APPROACH CATEGORY - An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 V_{so} (V_{so} is the aircraft stall speed at the maximum certificated landing weight). V_{so} and the maximum certificated landing weight are established for the aircraft by the certificating authority of the country of registry.

(1) Category A: Speed less than 91 knots;

(2) Category B: Speed 91 knots or more but less than 121 knots;

(3) Category C: Speed 121 knots or more but less than 141 knots;

(4) Category D: Speed 141 knots or more but less than 166 knots; and,

(5) Category E: Speed 166 knots or more.

AIRCRAFT MIX - The relative percentage of operations conducted at an airport by each of four classes of aircraft differentiated by gross takeoff weight and number of engines.

AIR SPACE - Space above the ground in which aircraft travel; divided into corridors, routes and restricted areas.

AIR TAXI - Air taxi is an aircraft operation by the holder of an air taxi operating certificate which authorizes the carriage of passengers, mail, or cargo for revenue in accordance with FAR Part 135.

AIRPLANE DESIGN GROUP (PHYSICAL CHARACTERISTICS) - The airplane design group subdivides airplanes by wingspan. The airplane design group concept links an airport's dimensional standards to aircraft approach categories or to airplane design groups or to runway instrumentation configurations.

(1) Airplane Design Group I: Wingspan up to but not including 49 feet (15 m);

(2) Airplane Design Group II: Wingspan 49 feet (15 m) up to but not including 79 feet (24 m);

(3) Airplane Design Group III: Wingspan 79 feet (24 m) up to but not including 118 feet (36 m);

(4) Airplane Design Group IV: Wingspan 118 feet (36 m) up to but not including 171 feet (52 m);

(5) Airplane Design Group V: Wingspan 171 feet (52 m) up to but not including 197 feet (60 m); and,

(6) Airplane Design Group VI: Wingspan 197 feet (60 m) up to but not including 262 feet (80 m).

AIRPORT AVAILABLE FOR PUBLIC USE - An airport available for use by the public with or without a prior request.

AIRPORT HAZARD - An airport hazard is any structure or natural object located on or in the vicinity of a public airport, or any use of land near such airport, that obstructs the airspace required for the flight of aircraft in landing or taking off at the airport or is otherwise hazardous to aircraft landing, taking off, or taxiing at the airport.

AIRPORT LAYOUT PLAN (ALP) - The current and planned airport development portrayal, which may be part of an airport master plan.

AIRPORT MASTER PLAN (AMP) - A long term development plan for an airport, adopted by the airport proprietor.

ALS - Approach Light System.

AMBIENT NOISE - All encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far.

APPROACH END OF RUNWAY - The approach end of runway is the near end of the runway as viewed from the cockpit of a landing airplane.

APPROACH SLOPE - Imaginary areas extending out and away from the approach ends of runways which are to be kept clear of obstructions.

APPROACH SURFACE - An element of the airport imaginary surfaces, longitudinally centered on the extended runway centerline, extending upward and outward from the end of the primary surface at a designated slope.

ASV - Annual Service Volume.

AVIGATION AND HAZARD EASEMENT - An easement which provides right of flight at any altitude above the approach surface, prevents any obstruction above the approach surface, provides a right to cause noise vibrations, prohibits the creation of electrical interferences, and grants right-of-way entry to remove trees or structures above the approach surface.

-B-

BASED AIRCRAFT - An aircraft permanently stationed at an airport, usually by some form of agreement between the aircraft owner and airport management.

BIT - Bituminous Asphalt Pavement.

BUSINESS JET - Any of a type of turbine powered aircraft carrying six or more passengers and weighing less than 65,000 pounds gross takeoff weight.

-C-

CIRCLING APPROACH - A descent in an approved procedure to an airport a circle-to-land maneuver.

COMMUTER AIRLINE - Commuter is an air carrier certified in accordance with FAR Part 135, air taxi operators and commercial operators, and authorized to provide air transportation of passengers or cargo pursuant to a published schedule of at least five round trips per week, between two or more points, or transports mail pursuant to a contract with the U.S. Postal Service.

CONICAL SURFACE - An imaginary surface extending upward and outward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CROSSWIND RUNWAY - A runway aligned at an angle to the prevailing wind which allows use of an airport when crosswind conditions on the primary runway would otherwise restrict use.

-D-

DECISION HEIGHT (DH) - With respect to the operation of aircraft, this means the height at which a decision must be made, using an ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.

DISPLACED THRESHOLD - A displaced threshold is a threshold located at a point on the runway other than at the runway end.

DISTANCE MEASURING EQUIPMENT (DME) - An electronic installation established with either a VOR or ILS to provide distance information from the facility to pilots by reception of electronic signals. It measures, in nautical miles, the distance of an aircraft from a NAVAID.

-E-

ENPLANEMENT - Any passenger boarding an aircraft at an airport. Can be either a local origination or a connecting passenger. Applies also to freight shipments.

ENROUTE - The route of flight from point of departure to point of destination, including intermediate stops (excludes local operations).

-F-

FAA - Federal Aviation Administration.

FAR - Federal Aviation Regulations issued by the Federal Aviation Administration to implement the agency's statutory authority.

FAR PART 77 - A regulation establishing standards for determining obstructions to navigable airspace.

FAR PART 139 - A regulation establishing standards for the operation of air taxi and commercial operations of small aircraft.

FAR PART 150 - A regulation establishing criteria for noise assessment and procedures and criteria for FAA approval of noise compatibility programs.

FBO - Fixed Base Operator.

FINAL APPROACH IFR - The flight path of an aircraft which is inbound to the airport on an approved final instrument approach course, beginning at the point of interception of that course and extending to the airport or the point where circling for landing or missed approach is executed.

FINAL APPROACH VFR - A flight path of landing aircraft in the direction of landing along the extended runway centerline from the base leg to the runway.

FLEET MIX - The proportion of aircraft types or models expected to operate at an airport.

-G-

GENERAL AVIATION (GA) - Refers to all civil aircraft and operations which are not classified as air carrier.

-H-

HELIPORT - An airport or an area of the airport used or intended to be used for the landing and takeoff of helicopters.

HIRL - High Intensity Runway Lighting.

HORIZONTAL SURFACE - An imaginary surface constituting a horizontal plane 150 feet above the airport elevation.

-I-

IMAGINARY SURFACE - An area established in relation to the airport and to each runway consistent with FAR Part 77 in which any object extending above these imaginary surfaces is, by definition, an obstruction.

INSTRUMENT APPROACH - An approach conducted while the final approach fix is below VFR minimums.

INSTRUMENT FLIGHT RULES (IFR) - Rules by which aircraft are operated without visual reference to the ground, usually when cloud ceiling are less than 1,000 feet or visibility is less than 3 miles.

INSTRUMENT LANDING SYSTEM (ILS) - A system which provides in the aircraft, the lateral, longitudinal, and vertical guidance necessary for landing.

INSTRUMENT OPERATION - A landing or takeoff conducted while operating on an instrument flight plan.

INSTRUMENT RUNWAY - A runway equipped with electronic and visual navigation aids for which a precision or non-precision approach procedure having straight-in landing minimums has been established.

INTEGRATED NOISE MODEL (INM) - A computer-based airport noise exposure modelling program.

ITINERANT OPERATION - All aircraft arrivals and departures other than local operations.

-J-

-L-

LANDING MINIMUMS/IFR LANDING MINIMUMS - The minimum visibility prescribed for landing while using an instrument approach procedure.

LARGE AIRCRAFT - A large aircraft is an aircraft of more than 12,500 pounds (5,700 kg) maximum certificated takeoff weight.

LAT - Latitude.

LOC (LOCALIZER) - Part of ILS that provides course guidance to the runway.

LOCAL OPERATION - Operations performed by aircraft which: a) operate in the local traffic pattern or within sight of the tower; b) are known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the control tower; or c) execute simulated instrument approaches or low passes at the airport.

LONG - Longitude.

-M-

MALS - Medium (intensity) Approach Light System.

MALSR - MALS with runway alignments indicator lights (RAILs).

MASTER PLAN - Long-range plan of airport development requirements.

MILITARY OPERATION - An operation by military aircraft.

MIRL - Medium Intensity Runway Lighting.

MISSED APPROACH - A prescribed procedure to be followed by aircraft that cannot complete an attempted landing at an airport.

MITL - Medium Intensity Taxiway Lighting.

MSL - Mean Sea Level.

-N-

NAVAID - See Air Navigation Facility.

NDB (NON-DIRECTIONAL BEACON) - An electronic ground station transmitting in all directions in the L/MF frequency spectrum; provides azimuth guidance to aircraft equipped with direction finder receivers. These facilities are often established with ILS outer markers to provide transition guidance to the ILS system.

NM - Nautical Mile.

NOISE ABATEMENT - A procedure for the operation of aircraft at an airport which minimizes the impact of noise on the environs of the airport.

NOISE CONTOUR - A noise impact boundary line connecting points on a map where the level of sound is the same.

NOISE EXPOSURE MAP - A scaled, geographic depiction of an airport, its noise contours and surrounding area.

NON-PRECISION APPROACH PROCEDURE/NON-PRECISION APPROACH - A standard instrument approach procedure in which no electronic glide slope is provided.

NON-PRECISION INSTRUMENT RUNWAY - A non-precision instrument runway is one with an instrument approach procedure utilizing air navigation facilities, with only horizontal guidance, or area-type navigation equipment for which a straight-in non-precision instrument approach procedure has been approved or planned, and no precision approach facility or procedure is planned or indicated on an FAA or DOD approved airport layout plan, or on other FAA or DOD planning documents.

NPIAS - National Plan of Integrated Airport Systems.

NYSDOT - New York State Department of Transportation.

-O-

OBSTACLE FREE ZONE - An OFZ is an area: Comprised of the runway OFZ, the approach OFZ, and the inner-transitional surface OFZ.

(a) Runway OFZ - The runway OFZ is the volume of space above a surface longitudinally centered on the runway. The elevation of any point on the surface is the same as the elevation of the nearest point on the runway centerline. The runway OFZ extends 200 feet (60 m) beyond each end of the runway and its width is:

(b) Approach OFZ - The approach OFZ is the volume of space above a surface which has the same width as the runway OFZ and rises at a slope of 50 (horizontal) to 1 (vertical) away from the runway into the approach area.

(c) Inner-Transitional Surface OFZ - The inner-transitional surface OFS is the volume of space above the surfaces which slope 3 (horizontal) to 1 (vertical) laterally from the edges of the runway OFZ and approach OFS and end at the height of 150 feet (45 m) above the established airport elevation.

(2) Free of all fixed objects. FAA approved frangible equipment which provides an essential aviation service may be located in the OFZ, provided the amount of penetration is kept to a practical minimum.

(3) Clear of vehicles as well as parked, holding, or taxiing aircraft in the proximity of an airplane conducting an approach, missed approach, landing, takeoff, or departure.

OBSTRUCTION - Any object/obstacle exceeding the obstruction standards specified by FAR Part 77.

OBSTRUCTION LIGHT - A light, or one of a group of lights, usually red or white, frequently mounted on a surface structure or natural terrain to warn pilots of the presence of an obstruction.

OPERATION - A takeoff, landing, low approach, or missed approach.

-P-

PAPI - Precision Approach Path Indicator.

PRECISION APPROACH - A standard instrument approach in which an electronic glide slope is provided.

PRIMARY RUNWAY - The runway on which the majority of operations take place. On large, busy airports, there may be two or more parallel primary runways.

PRIMARY SURFACE - An area longitudinally centered on a runway with a width ranging from 250 to 1000 feet and extending 200 feet beyond the end of a paved runway.

PROHIBITED AREA - Airspace of defined dimensions identified by an area on the surface of the earth within which flight is prohibited.

-R-

RASP - Regional Airport System Plan.

REIL - Runway End Identifier Lights.

RELIEVER AIRPORT - An airport relieving congestion at a commercial service airport and providing more general aviation access to the overall community.

RELOCATED THRESHOLD - A relocated threshold is a permanent threshold located at the relocated runway end.

ROTATING BEACON - A visual NAVAID displaying flashes of white and/or colored light used to indicate location of an airport.

RUNWAY SAFETY AREA - An area symmetrical about the runway centerline and extending beyond the ends of the runway which shall be free of obstacles as specified.

RVR - Runway Visual Range.

RW and R/W - Runway.

-S-

SEGMENTED CIRCLE - An airport aid identifying the traffic pattern direction.

SMALL AIRCRAFT - A small aircraft is an aircraft of 12,500 pounds (5,700 kg) or less maximum certificated takeoff weight.

STRAIGHT-IN APPROACH - A descent in an approved procedure in which the final approach course alignment and descent gradient permits authorization of straight-in landing minimums.

SYSTEM PLAN - A representation of the aviation facilities required to meet the immediate and future air transportation needs and to achieve the overall goals.

-T-

TAXIWAY - A taxiway is a defined path, from one part of an airport to another, selected or prepared for the taxiing of aircraft.

TERMINAL AIRSPACE - The controlled airspace normally associated with aircraft departure and arrival patterns to/from airports within a terminal system and between adjacent terminal systems in which tower enroute air traffic control service is provided.

TERMINAL CONTROL AREA (TCA) - This consists of controlled airspace extending upward from the surface or higher to specified altitudes within which all aircraft are subject to positive air traffic control procedures.

TERPS - Terminal Instrument Procedures.

T-HANGAR - A T-shaped aircraft hanger which provides shelter for a single airplane.

THRESHOLD - The threshold is the beginning of that portion of the runway available and suitable for the landing of airplanes.

TOUCH-AND-GO - An aircraft operation that includes a landing immediately followed by a takeoff.

TRAFFIC PATTERN - The traffic flow that is prescribed for aircraft landing at, taxiing on and taking off from an airport. The usual components of a traffic pattern are upwind leg, crosswind leg, downwind leg and final approach.

TRANSIENT OPERATIONS - An operation performed at an airport by an aircraft that is based at another airport.

TRANSITIONAL SURFACE - An element of the imaginary surfaces extending outward at right angles to the runway centerline and from the sides of the primary and approach surfaces to where they intersect the horizontal and conical surfaces.

TRANSPORT AIRPORT - A transport airport is an airport designed, constructed, and maintained to serve airplanes in Aircraft Approach Category C and D.

TW and T/W - Taxiway.

-U-

UHF - Ultra High Frequency.

UTILITY AIRPORT - A utility airport is an airport designed, constructed, and maintained to serve airplanes in Aircraft Approach Category A and B.

-V-

VASI - Visual Approach Slope Indicator providing visual glide path.

VFR - Visual Flight Rules that govern flight procedures in good weather.

VHF - Very High Frequency.

VISUAL APPROACH RUNWAY - A runway intended for visual approaches only.

VISUAL OMNIRANGE RECEIVER (VOR) - A unit designed to receive very high frequency (VHF) omnidirectional radio navigational aids.

VISUAL RUNWAY - A visual runway is a runway intended solely for the operation of aircraft using visual approach procedures.

VOR - Very High Frequency Omnirange Station. A ground-based radio (electronic) navigation aid transmitting radials in all directions in the VHF frequency spectrum; provides azimuth guidance to pilots by reception of electronic signals.

-W-

WIND-CONE (WIND SOCK) - Conical wind direction indicator.

WIND COVERAGE - Wind coverage is the percent of time for which aeronautical operations are considered safe due to acceptable crosswind components.

WIND TEE - A visual device used to advise pilots about wind direction at an airport.

-Y-

YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (Ldn) - The 24-hour average sound levels, in decibels, for the period from midnight to midnight, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. the following day, averaged over a span of one year.

APPENDIX D

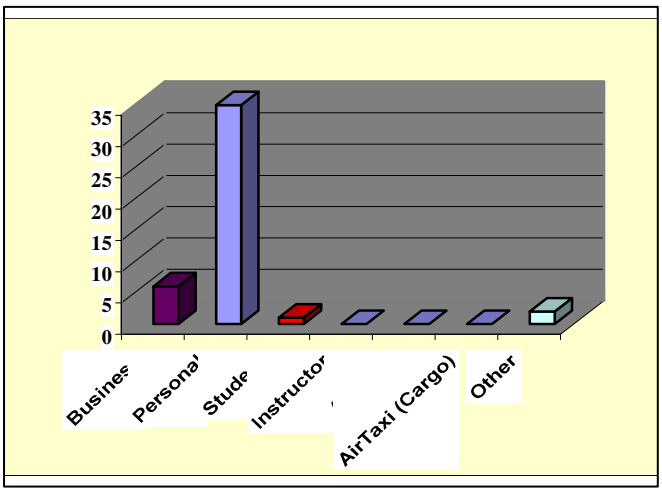
PILOT SURVEY SUMMARY

APPENDIX D
PILOTS SURVEY SUMMARY

Collection of data for the Master Plan included sending out one hundred and forty-one surveys to certified pilots within the Floyd Bennett Memorial study area. Forty-two (30%) responded out of the total one hundred forty-one surveys. The following is a summary of results from the Pilot Survey.

Of the 30% who responded, the largest proportions are privately licensed pilots (83%) with an instrument rating (29%). Of the respondents, 55% base their aircraft at Floyd Bennett Memorial Airport with the remainder split between Saratoga County, Schenectady County and Argyle. Aircraft used by the respondent pilots are predominantly single engine planes (79%). Approximately 7% own and operate multi-engine or turboprop planes.

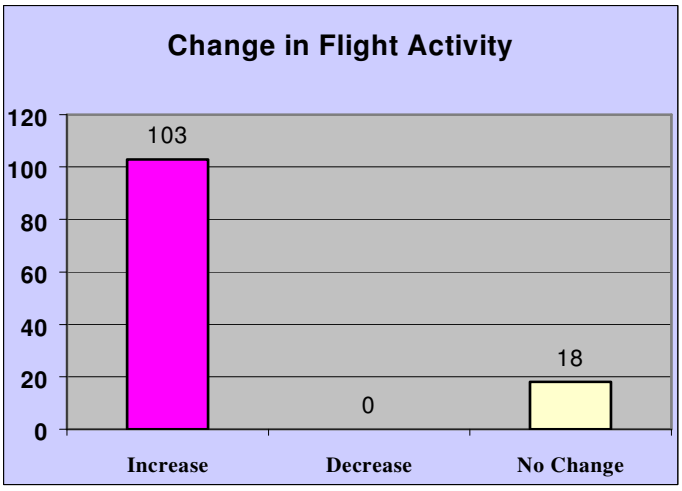
CHART 1
PRIMARY PURPOSE OF FLIGHT ACTIVITY



Source: C&S Engineers, Inc.

The primary purpose of flight activity according to respondents (Chart 1) is overwhelmingly *personal* at 83% (or 35 respondents) with *business* following at 14% (6 respondents). Over the past year (1999-2000), itinerant operations versus local operations among the respondents is roughly a 35% to 65% split, respectively. Of the respondents, 52% anticipate that their flying activity will increase over the next five years.

CHART 2
CHANGE IN FLIGHT ACTIVITY



Source: C&S Engineers, Inc.

The primary reason that the respondents utilize the Floyd Bennett Memorial Airport is *convenience* (60%), followed by *location*, *services* and *facilities*. The facilities were rated as follows:

- Out of 24 that rated the ***flight schools*** at the airport, 4 rated them *high* with 20 rating them *average.*

- Out of 26 that rated ***maintenance rates***, 4 rated them as *high*, 21 rated them *average* and rated them *low*.

- Out of 31 that rated ***fuel costs***, 9 rated them *high* and 22 rated them *average.*

- Out of 25 that rated ***aircraft storage and parking fees***, 3 rated them *high,* 19 rated them *average* and the remaining 3 rated them *low.*

- Out of 31 that rated ***FBO services***, 11 rated them *excellent*, 13 rated them *good*, 6 rated them fair and 1 rated them *poor.*

- Out of 32 that rated the airport's ***NAVAIDs***, 21 rated them *excellent*, 10 rated them *good*, and 1 rated them *fair*.

- Out of 27 that rated the airport's ***hangar facilities***, 2 rated them *excellent*, 8 rated them *good*, 10 rated them *fair* and 7 rated them *poor*.

- Out of 32 that rated the airport's ***pavement conditions***, 14 rated the pavement as *excellent*, 16 rated it *good*, 1 rated it *fair* and 1 rated it *poor*.

- Out of 31 who rated the airport's ***snow removal***, 20 rated it as *excellent* and 10 rated it as *good* and 1 rated it as *fair*.

- Out of 33 that rated the ***geographic location*** of the airport, 22 rated it *excellent* and 10 rated it *good* and 1 rated it as *fair*.

To briefly summarize, pilots who responded to the survey rated the Floyd Bennett Memorial Airport facilities and its associated services, such as flight schools, fuel maintenance rates, aircraft and parking fees, FBO services, pavement conditions, and navigational aids as average to above average. The respondents rated the airport navigational aids, snow removal and geographic location favorably from good to excellent. There is evidence the hangar facilities need improvements since the survey implies that the facilities are deficient for the needs of the current users and pilots who base their aircraft at the airport. The primary reasons that the Pilot Survey respondents utilize Floyd Bennett Memorial Airport is for *convenience*, *location*, its *services* and *facilities*, which indicates a favorable approval of the airport for General Aviation use.

APPENDIX E

AIRPORT CAPACITY AND DELAY DATA

APPENDIX E
AIRPORT CAPACITY AND DELAY DATA

C = Percent of airplanes over 12,500 lbs. but not over 300,000 lbs……100
D = Percent of airplanes over 300,000 lbs……...0
Mix Index (C+3D)……100
Annual demand……38,000
General aviation operations dominate

AIRPORT CAPACITY AND DELAY FOR LONG RANGE PLANNING

Runway Layout	Capacity			Ratio of Annual Demand to ASV	Average Delay per Aircraft		Minutes of Annual Delay	
(Sketch) No.	(Ops/Hour) VFR	IFR	ASV	Ratio	(Minutes) Low	High	(000) Low	High
8	210	117	565,000	0.07	0.0	0.0	0	0
7	161	117	510,000	0.07	0.0	0.0	0	0
4	111	105	315,000	0.12	0.0	0.1	0	4
12	111	105	315,000	0.12	0.0	0.1	0	4
6	161	70	315,000	0.12	0.0	0.1	0	4
5	149	70	310,000	0.12	0.0	0.1	0	4
3	111	70	300,000	0.13	0.0	0.1	0	4
11	111	70	300,000	0.13	0.0	0.1	0	4
16	146	59	300,000	0.13	0.0	0.1	0	4
18	146	59	300,000	0.13	0.0	0.1	0	4
19	146	59	300,000	0.13	0.0	0.1	0	4
13	138	59	295,000	0.13	0.0	0.1	0	4
2	105	59	285,000	0.13	0.0	0.1	0	4
10	105	59	285,000	0.13	0.0	0.1	0	4
17	105	59	285,000	0.13	0.0	0.1	0	4
14	77	59	225,000	0.17	0.0	0.1	0	4
15	77	59	225,000	0.17	0.0	0.1	0	4
9	76	59	225,000	0.17	0.0	0.1	0	4
1	55	53	210,000	0.18	0.1	0.1	4	4

REFERENCE: Chapter 2 of AC 150/5060-5, Airport Capacity and Delay, including Changes 1 and 2.

APPENDIX F

ENVIRONMENTAL CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
3817 LUKER ROAD
CORTLAND, NY 13045

May 30, 2000

Mr. Joshua P. Emhoff
Assistant Planner
C&S Engineers, Inc.
Syracuse Hancock International Airport
Syracuse, NY 13212

Dear Mr. Emhoff:

This responds to your letter of May 2, 2000, requesting information on the presence of Federally listed or proposed endangered or threatened species in the vicinity of the Floyd Bennett Memorial Airport in the Town of Queensbury, Warren County, New York. The information will be used in preparation of an airport master plan.

Except for occasional transient individuals, no Federally listed or proposed endangered or threatened species under our jurisdiction are known to exist in the project impact area. Therefore, no Biological Assessment or further Section 7 consultation under the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) is required with the U.S. Fish and Wildlife Service (Service). Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

The above comments pertaining to endangered species under our jurisdiction are provided pursuant to the Endangered Species Act. This response does not preclude additional Service comments under the Fish and Wildlife Coordination Act or other legislation.

For additional information on fish and wildlife resources or State-listed species, we suggest you contact:

New York State Department of
Environmental Conservation
Region 5
Route 86
Ray Brook, NY 12977
(518) 897-1333

New York State Department of
Environmental Conservation
Wildlife Resources Center - Information Services
New York Natural Heritage Program
700 Troy-Schenectady Road
Latham, NY 12110-2400
(518) 783-3932

National Wetlands Inventory (NWI) maps may or may not be available for the project area. However, while the NWI maps are reasonably accurate, they should not be used in lieu of field surveys for determining the presence of wetlands or delineating wetland boundaries for Federal regulatory purposes. Copies of specific NWI maps can be obtained from:

Cornell Institute for Resource Information Systems
302 Rice Hall
Cornell University
Ithaca, NY 14853
(607) 255-4864

Work in certain waters and wetlands of the United States may require a permit from the U.S. Army Corps of Engineers (Corps). If a permit is required, in reviewing the application pursuant to the Fish and Wildlife Coordination Act, the Service may concur, with or without stipulations, or recommend denial of the permit depending upon the potential adverse impacts on fish and wildlife resources associated with project implementation. The need for a Corps permit may be determined by contacting Mr. Joseph Seebode, Chief, Regulatory Branch, U.S. Army Corps of Engineers, 26 Federal Plaza, New York, NY 10278 (telephone: [212] 264-3996).

If you require additional information please contact Michael Stoll at (607) 753-9334.

Sincerely,

June M DeWeese

David A. Stilwell
Field Supervisor

cc: NYSDEC, Ray Brook, NY (Environmental Permits)
NYSDEC, Latham, NY
COE, New York, NY

DEPARTMENT OF STATE

George E. Pataki
Governor
Alexander F. Treadwell
Secretary of State

Division of
Coastal Resources
41 State Street
Albany, NY 12231-0001

FAX MEMORANDUM

TO: JOSHUA P. EMHOFF, ASSISTANT PLANNER
CVS COMPANIES, SYRACUSE HANCOCK INTERNATIONAL AIRPORT
SYRACUSE, NY 13212 (315) 455-2000, (315) 455-9667 (FAX)

FROM: DAVID BUERLE

DATE: JULY 6, 2000

MESSAGE: RE: YOUR THREE (3) TWO PAGE FAX TRANSMISSION SHEETS (CVS FILE NUMBERS 107, 129, AND 393) DATED JUNE 20, 2000. A COPY OF THE LOCATIONS OF THE: 1) FLOYD BENNETT MEMORIAL AIRPORT IN WARRENSBURG, WARREN COUNTY; 2) WATERTOWN INTERNATIONAL AIRPORT IN WATERTOWN, JEFFERSON COUNTY, AND; 3) OGDENSBURG INTERNATIONAL AIRPORT IN OSWEGATCHIE, ST. LAWRENCE COUNTY SHOWS THAT ALL THREE ARE OUTSIDE THE STATE'S COASTAL ZONE.

The original of this document will be sent by:
- [X] this will be the only form of delivery
- [ ] overnight mail
- [ ] ordinary mail

Number of sheets (including this cover sheet): ONE (1)

New York State Department of Environmental Conservation
Division of Fish, Wildlife & Marine Resources
Wildlife Resources Center – New York Natural Heritage Program
700 Troy-Schenectady Road, Latham, New York 12110-2400
Phone: (518) 783-3932 FAX: (518) 783-3916

John P. Cahill
Commissioner

July 13, 2000

Joshua P Emhoff
C & S Engineers
Syracuse Hancock International Airport
Syracuse, NY 13212

Dear Mr. Emhoff:

In response to your recent request, we have reviewed the New York Natural Heritage Program databases with respect to the proposed Land Acquisition at the Floyd Bennett Memorial Airport, area as indicated on the map you provided, located in the Town of Warrensburg, Warren County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

This response applies only to known occurrences of rare or state-listed animals and plants, of significant natural communities, and of other significant habitats. For information regarding regulated areas or permits that may be required under state law (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

Sincerely,

Betty Ketcham

Betty A. Ketcham Information Services
NY Natural Heritage Program

Encs.
cc: Reg. 5, Wildlife Mgr.
Reg. 5, Fisheries Mgr.
Reg. 5, Bureau of Habitat

Natural Heritage Report on Rare Species and Ecological Communities

Prepared 11 July 2000 by NY Natural Heritage Program, NYS DEC, Latham, New York

Records with a Precision value of "S" or with a blank Precision are known to be in a location that may be impacted by the proposed action.
Records with a Precision value of "M" may possibly occur within the project area in appropriate habitat.
This report contains SENSITIVE information that should be treated in a sensitive manner -- Please see cover letter.
Refer to the Users' Guide for explanations of codes, ranks, and fields.

* County
** Town

Scientific Name, COMMON NAME, & Group Name	NY Legal Status, Heritage Ranks, & Federal Status	Precision & Acreage	EO Rank & Last Seen	General Habitat and Quality	Detailed Location	USGS Topo Quad	Office Use
* WARREN							
** QUEENSBURY							
Cypripedium candidum SMALL WHITE LADYSLIPPER Vascular Plant	ENDANGERED G4; S1	M	H 1942		ROSECRANZ SWAMP ROSECRANZ SWAMP, N OF GLENS FALLS.	HUDSON FALLS	4307335
MARL FEN Community	UNPROTECTED G2G3; S1	S 60	D 1988-06-22	SITE SEVERELY DEGRADED, WATER TABLE BEEN LOWERED BY PUMPING. FORMERLY, OPEN MARL FLATS AND MARLY POOLS WERE BETWEEN AIRPORT RUNWAYS AND RICH SWAMP (BOTH HARDWOOD SWAMP AND THUJA SWAMP). SEVERELY DEGRADED AND DRAINED BY DITCHING AND PUMPING.	GLENS FALLS AIRPORT MARSH, ROSENCRANS SWAMP FROM DIX AVE. IN GLENS FALLS, N ABOUT 1.2 MI ON QUEENSBURY AVE TO DIRT RD ON W LEADING TO S END OF AIRPORT RUNWAYS, FEN IS S AND W OF RUNWAYS.	HUDSON FALLS	4307335

2 Records Processed

Natural Heritage Map of Rare Species and Ecological Communities

Prepared July 11, 2000 by NY Natural Heritage Program, NYS DEC, Latham, New York

Project Site: Floyd Bennet Airport

New York Natural Heritage Program Database Records*

- Animal
- Plant
- Community
- Other

N

Scale: 1:24000

0.5 0 0.5 Miles

*The information displayed on this map is considered sensitive and may not be released to the public.

New York State Department of Environmental Conservation
Division of Environmental Permits, Region 5
Route 86 – P.O. Box 296, Ray Brook, New York 12977
Phone: (518) 897-1234 • **FAX:** (518) 897-1394
Website: www.dec.state.ny.us

Mr. Joshua P. Emhoff
Assistant Planner
C&S Engineers, Inc.
Syracuse Hancock International Airport
Syracuse, NY 13212

Re: Floyd Bennett Memorial Airport
Master Plan

Dear Mr. Emhoff:

I have been asked to respond to your letter of May 2, 2000 to Regional Director Stuart Buchanan regarding information on a number of identified Environmental Impact Categories.

The nature of your request is not sufficient to allow us to identify any specific jurisdiction or concerns that our Department may have. In order for us to have any meaningful comments, we need more specific information on particular developments or activities that may be proposed for the subject facility. As far as general information for the Environmental Impact Categories that you identified, we do have a number of references, such as Freshwater Wetlands Maps, Protected Steam Classifications and Archeological Sensitivity Maps, available in our Warensburg Office that you may want to review. In addition, if you know specific actions or activities that are proposed, our Bureau of Habitat can make a determination on the potential impact to threatened or endangered species. In order to schedule an appointment to review this information, please contact the Environmental Permits Office in Warrensburg (Telephone 518-623-1281).

Sincerely,

R. A. Wild

Richard A. Wild
Regional Permit Administrator

cc: S. Buchanan
T. Hall w/incoming
K. Kogut w/incoming

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278–0090

June 22, 2000

REPLY TO
ATTENTION OF

Planning Division

Joshua P. Emhoff
Assistant Planner
C&S Engineers, Inc.
Syracuse Hancock International Airport
Syracuse, NY 13212

RE: Floyd Bennet Memorial Airport Master Plan

Dear Mr. Emhoff:

Thank you for your letter dated May 2, 2000 and pertinent documents regarding the above referenced project. We have completed our review and enclose comments for your use (Enclosure 1).

Should you require any further assistance in this matter, please feel free to contact Mr. David Webb, NEPA Review Coordinator at (212) 264-2008.

Sincerely,

Roselle Henn
Acting Chief, Environmental Analysis Branch

Attachments

Enclosure 1

Comments for
Floyd Bennet Memorial
Airport Master Plan

1. **Cultural Resources:** The supplied map does not indicate clearly what is being done. Are all of the Runway Protection Zones new or is it only the labeled one in the southern portion of the map? Cultural Resource investigation of the southern Runway Protection Zone should be conducted as there is high potential for, at the least, prehistoric activity because of the proximity of both streams and wetlands.

2. **Permits:** The Army Corps of Engineers regulates activities that include dredging or construction activities in or over any navigable waters of the United States, the placement of any dredged or fill material in any waters of the United States (including coastal or inland wetlands) or the accomplishment of any work affecting the course, location, condition or capacity of such areas. Such activities may require a Department of the Army permit, in accordance with 33 CFR 320-330.

OFFICE OF PARKS · RECREATION · HISTORIC PRESERVATION
NEW YORK STATE

Bernadette Castro
Commissioner

New York State Office of Parks, Recreation and Historic Preservation
Historic Preservation Field Services Bureau
Peebles Island, PO Box 189, Waterford, New York 12188-0189
518-237-8643

June 16, 2000

Joshua P. Emhoff
Assistant Planner
C&S Engineers, Inc.
Syracuse Hancock International Airport
Syracuse, New York 13212

Dear Mr. Emhoff:

Re: FAA
Floyd Bennett Memorial Airport
Queensbury, Warren County
00PR2108

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP) concerning your project's potential impact/effect upon historic and/or prehistoric cultural resources. Our staff has reviewed the documentation that you provided on your project. Preliminary comments and/or requests for additional information are noted on separate enclosures accompanying this letter. A determination of impact/effect will be provided only after ALL documentation requirements noted on any enclosures have been met. Any questions concerning our preliminary comments and/or requests for additional information should be directed to the appropriate staff person identified on each enclosure.

In cases where a state agency is involved in this undertaking, it is appropriate for that agency to determine whether consultation should take place with OPRHP under Section 14.09 of the New York State Parks, Recreation and Historic Preservation Law. In addition, if there is any federal agency involvement, Advisory Council on Historic Preservation's regulations, "Protection of Historic and Cultural Properties" 36 CFR 800 requires that agency to initiate consultation with the State Historic Preservation Officer (SHPO).

When responding, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont

Ruth L. Pierpont
Director

RLP:bsd
Enclosure(s)

ARCHEOLOGY COMMENTS

00PR2108

Based on reported resources, there may be archeological sites within your project area. Therefore, the Office of Parks, Recreation and Historic Preservation (OPRHP) recommends that a Phase I archeological survey is warranted, unless substantial prior ground disturbance can be documented. If you consider the project area disturbed, documentation of disturbance will need to be reviewed by the OPRHP.

A Phase 1 survey is designed to determine the presence or absence of archeological sites or other cultural resources in the project's area of potential effect. The Phase 1 survey is divided into two progressive units of study including a Phase 1A sensitivity assessment and initial project area field inspection, and a Phase 1B subsurface testing program for the project area. The OPRHP can provide standards for conducting cultural resource investigations upon request. Cultural resource surveys and survey reports that meet these standards will be accepted and approved by the OPRHP.

Our Office does not conduct cultural resources surveys. A 36 CFR 61 qualified archeologist should be retained to conduct the Phase 1 survey. Many archeological consulting firms advertise their availability in the yellow pages. The services of qualified archeologists can also be obtained by contacting local, regional, or statewide professional archeological organizations. Phase 1 surveys can be expected to vary in cost per mile of right-of-way or by the number of acres impacted. We encourage you to contact a number of consulting firms and compare examples of each firm's work to obtain the best product.

Documentation of ground disturbance should include a description of the disturbance with confirming evidence. Confirmation can include current photographs and/or older photographs of the project area which illustrate the disturbance (approximately keyed to a project area map), past maps or site plans that accurately record previous disturbances, the land use history, and/or current soil borings that verify past disruptions to the land

If you have any questions concerning archeology, please call Cynthia Blakemore at (518) 237-8643 ext. 3288.

REQUEST FOR ADDITIONAL INFORMATION BUILDINGS/STRUCTURES/DISTRICTS

PROJECT NUMBER **00 PR 2108**

In order for us to complete our evaluation of the historic significance of all buildings/structures/districts within or adjacent to your project area we will need the following additional information:

- ☐ Full project description with map
- ☒ **Clear, original photographs of all buildings/structures/objects 50 years or older within or adjacent to the project area *keyed to a site map*.**
- ☒ **Clear, original photographs of the project site and looking out from the project site in all directions *keyed to a site map*.**
- ☐ Date of construction
- ☐ Brief history
- ☐ Clear, original photographs of the following:
- ☐ Other:

Please provide only the additional information checked above. If you have any questions concerning this request for additional information, please call Lynn Garofalini at (518) 237-8643 ext. 3267.

PLEASE BE SURE TO REFER TO THE PROJECT NUMBER NOTED ABOVE WHEN RESPONDING TO THIS REQUEST

APPENDIX G

SUPPLEMENTAL RUNWAY LENGTH ANALYSIS

Floyd Bennett Memorial Airport

Master Plan Update

Supplemental Runway Length Analysis

Introduction:

In 2002, C&S Engineers, Inc., completed a draft Airport Master Plan Update for the Floyd Bennett Memorial Airport. One of the recommendations of the update was an extension of Runway 1-19 from 5,000 to 6,000 feet to support the increase of jet operations at the airport. The extension justification was based on the use of the airport by a Gulfstream G-IV aircraft. Comments on the update provided by the FAA in January of 2004 indicated that the justification of the runway extension was insufficient; specifically, the comment indicated that there was insufficient data to show that there were at least 350 annual departures of the G-IV in order to use it as the critical aircraft for runway length calculations.

Airport administration, in conjunction with the Fixed Base Operator, undertook a detailed analysis of aircraft operations at the airport and runway length necessary to support these operations. This analysis consisted of three elements:

1. Counts of actual jet aircraft operations based on IFR traffic records and FBO fueling records.
2. Analysis of runway length requirements based on Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*.
3. Survey of jet aircraft operators using the Floyd Bennett Memorial Airport.

Each of these elements is explained in detail below.

Jet Aircraft Operations Counts:

Since the Floyd Bennett Memorial Airport has no control tower and is not staffed 24 hours per day, other data was used to develop counts of jet aircraft operations. Only turbojet aircraft operations were counted in this analysis since the existing runway at the airport is sufficient for all piston and turboprop operations. The jet operations counts were developed in two steps:

1. Airport management contracted with RLM Software, Inc., who provided IFR arrivals data from their archive for the period from October 1, 2003, through September 30, 2004. This data was sorted by aircraft type and tabulated. The number of arrivals was doubled to get total aircraft operations.

2. FBO fueling records for jet fuel sales for the same period were compared against the IFR arrivals data. Each aircraft tail number recorded in the fueling records was checked in the aircraft registration database to determine aircraft type. The tail numbers were also compared against the IFR arrivals records; any record in the fuel sales sheets that could not be matched with a record in the IFR arrivals data was counted as two additional operations to account for either VFR flights or flights that cancel an IFR flight plan before approach to the airport. FBO staff also provided an estimate of jet operations that do not fuel and most likely operate VFR. One such aircraft, a Gulfstream G-IV, is owned by an individual living in the area, but the aircraft is based at a nearby airport with a management company. That aircraft operates frequently at the airport, but usually operates VFR to and from the facility.

Table 1 presents a summary of the jet operations counts.

Table 1
Floyd Bennett Memorial Airport
Jet Aircraft Operations
October 1, 2003 through September 30, 2004

Aircraft Type	IFR Records	FBO Records	Total
Beechjet 400	64	4	68
Bombardier Global Express	12	0	12
Canadair Challenger 600	34	8	42
Cessna Citation I	4	10	14
Cessna Citation I SP	4	0	4
Cessna Citation II	154	10	164
Cessna Citation V	174	12	186
Cessna Citation VII	20	4	24
Cessna Citation X	22	36	58
Cessna CitationJet	4	0	4
Cessna CitationJet CJ1	26	0	26
Dassault Falcon 10	8	14	22
Dassault Falcon 2000	18	0	18
Dassault Falcon 50	22	34	56
Dassault Falcon 900	6	6	12
Grumman Gulfstream II	2	0	2
Gulfstream II	12	0	12
Gulfstream III	30	0	30
Gulfstream IV	78	174	252
Gulfstream V	8	10	18
Gulfstream 100	4	0	4
Gulfstream 200	6	0	6
IAI Westwind	6	4	10
Lear 25	2	0	2
Lear 31	20	0	20
Lear 35	24	8	32
Lear 40	2	0	2
Lear 45	28	2	30
Lear 55	46	6	52
Lear 60	6	0	6
Mitsubishi Diamond Jet	8	2	10
Raytheon Hawker 800	136	6	142
Rockwell Sabre 40/60/65	2	0	2
Total	**992**	**350**	**1342**

Sources: RLM Software, Inc.; Floyd Bennett Memorial Airport; C&S Engineers, Inc.

Runway Length Requirement Analysis:

Several publications regarding runway length planning for business jets were published during the period from the initial draft of the Master Plan Update to the current analysis. On July 1, 2005, the FAA released the final version of Advisory Circular (AC) 150/5325-4B, *Runway Length Requirements for Airport Design*. Since the AC states that its use is mandatory for airports receiving federal funding, the procedures contained therein were used to prepare this runway length requirement analysis.

Paragraph 102 (b) (2) of the AC states that the runway length is determined based on a "family grouping of airplanes having similar performance characteristics and operating weights" when the maximum take-off weight (MTOW) of airplanes using the airport is 60,000 pounds or less. For most corporate jet aircraft, the AC provides tables which define the jet type by "percent of fleet" that it represents. For this analysis, the aircraft presented here in Table 1 were compared to Tables 3-1 and 3-2 of the Advisory Circular to determine the number of operations by percentage of fleet. Table 2 contains the results of this analysis.

Table 2
Floyd Bennett Memorial Airport
Jet Operations by Percent of Fleet

Aircraft Type	Total Operations	Percent of Fleet
Beechjet 400	68	75
Bombardier Global Express	12	Greater than 60,000 lbs MTOW
Canadair Challenger 600	42	100
Cessna Citation I	14	75
Cessna Citation I SP	4	75
Cessna Citation II	164	75
Cessna Citation V	186	75
Cessna Citation VII	24	75
Cessna Citation X	58	100
Cessna CitationJet	4	75
Cessna CitationJet CJ1	26	75
Dassault Falcon 10	22	75
Dassault Falcon 2000	18	100
Dassault Falcon 50	56	75
Dassault Falcon 900	12	100
Grumman Gulfstream II	2	Greater than 60,000 lbs MTOW
Gulfstream II	12	Greater than 60,000 lbs MTOW
Gulfstream III	30	Greater than 60,000 lbs MTOW
Gulfstream IV	252	Greater than 60,000 lbs MTOW
Gulfstream V	18	Greater than 60,000 lbs MTOW
Gulfstream 100	4	Not Listed in AC Table
Gulfstream 200	6	Not Listed in AC Table
IAI Westwind	10	75
Lear 25	2	75
Lear 31	20	75
Lear 35	32	75
Lear 40	2	75
Lear 45	30	75
Lear 55	52	100
Lear 60	6	100
Mitsubishi Diamond Jet	10	75
Raytheon Hawker 800	142	100
Rockwell Sabre 40/60/65	2	75
Total	**1342**	

Sources: FAA Advisory Circular 150/5325-4B; C&S Engineers, Inc.

The total operations by percent of fleet are 676 annual operations for aircraft in the 75 percent of fleet category, 330 annual operations for aircraft in the 100 percent of fleet category, 10 operations by aircraft that are less than 60,000 pounds MTOW but are not included in Table 3-1 or 3-2 in the Advisory Circular, and 326 annual operations by aircraft that have a MTOW of more than 60,000 pounds.

The next step of the analysis is to determine the runway length requirements for the critical family of aircraft. Since the 75 percent of fleet family already surpasses the AC's definition of substantial use (500 annual itinerant operations), the initial analysis was prepared using the performance curves from the AC for that family. To determine runway length requirements, the mean maximum temperature for the hottest month and the airfield elevation are required. The Master Plan Update stated that the average high temperature in the summer is 79° F. Data from the National Weather Service for July and August 2004 and 2005 supports this number. The airfield elevation for the airport is 328' MSL. Using Figure 3-1 from the AC, the recommended runway length for 60 percent of useful load is 4,620 feet, and the recommended runway length for 90 percent of useful load is 6,050 feet. The AC also indicates that the runway length curves presented in the figures are for "no wind, a dry runway surface, and zero effective runway gradient." Adjustments can be made for effective runway gradient or for wet and slippery runways; the length adjustments for these two factors are not cumulative. Per Paragraph 304.a., adjusting for the runway gradient would add 40 feet to each of these lengths for takeoff operations. Adjusting for landing operations of turbojet-powered airplanes under wet and slippery conditions, Paragraph 304.b. of the Advisory Circular states:

> By regulation, the runway length for turbojet-powered airplanes obtained from the "60 percent useful load" curves are increased by 15 percent or up to 5,500 feet (1,676 meters), whichever is less. By regulation, the runway lengths for turbojet powered airplanes obtained from the "90 percent useful load" curves are also increased by 15 percent or up to 7,000 feet (2,133 meters), whichever is less.

Since the airport receives an annual average of 35 inches of rain and 66 inches of snow, it is reasonable to adjust the figures for wet and slippery conditions. Therefore, the recommended runway lengths are adjusted to 5,310 feet for 60 percent of useful load and 6,960 feet for 90 percent of useful load.

The analysis also considered changes in the number of operations that could occur at the airport in the next 12 months. In April of 2006, a tenant at the airport expected to take delivery of a new Hawker 800, intending to put it on a FAR Part 135 Charter certificate. The aircraft would be based at the Floyd Bennett Memorial Airport, and due to its use in charter, could be expected to generate at least 300 operations per year. The Hawker 800 is listed in the AC as an aircraft in the 100 percent of fleet category. Adding the 300 annual operations of this Hawker to the previous total of 330 operations by aircraft in the 100 percent of fleet category yields 630 annual operations, which is more than the 500 operations defined as "substantial use." As a result, the runway length analysis was also performed using the curves from the AC in Table 3-2 for 100 percent of fleet. The results of this runway length requirement analysis are as follows: 5,150 feet for 100 percent of the fleet at 60 percent of useful load and 7,550 feet for 100 percent of the fleet at 90 percent of useful load, under dry conditions. Adjusting these lengths for wet and slippery conditions for 100 percent of the fleet at 60 percent of useful load would yield 5,500 feet (maximum allowable adjustment per Paragraph 304.b.), and 7,550 feet (no adjustment) for 100 percent of the fleet at 90 percent of useful load.

Survey of Jet Aircraft Operators:

In the spring of 2005, airport management and the FBO conducted a voluntary survey of jet operators at the airport to determine runway length needs based on the aircraft operating manuals and pilot's calculations. Eight responses were received, representing the following jet aircraft:

Bombardier Global Express
Canadair Challenger 604
Cessna Citation II
Cessna Citation VII
Learjet 55
Westwind 24
Beechjet 400
Hawker 800
Hawker 800 XP

Specifically, the survey asked whether the existing runway length of 5,000 feet was adequate for operations of the jets. Eighty-eight percent of the respondents indicated that it was not adequate and that they were forced to restrict their load or trip length due to the runway length. Typical destinations for these aircraft were also requested, and the responses varied from short hops to Boston to longer flights to the Midwest and the South, and flights to Vancouver. The respondents were asked to provide an ideal runway length for their operations. The average of all responses was 6,375 feet.

Conclusion:

Based on the analyses presented in this document, the existing runway length of the primary runway at the Floyd Bennett Memorial Airport is inadequate to support the current level of corporate jet operations. The family of aircraft operating at the airport require between 6,000 and 7,500 feet of runway, depending on load factors. The analysis does not include detailed runway length figures for aircraft with a MTOW greater than 60,000 pounds; however, survey data from some of these operators indicated that those aircraft using the airport also require greater runway length.

Based on the FAA's forecasts of general aviation growth and the Airport Master Plan Update for the Floyd Bennett Memorial Airport, jet activity in the area and at the airport is expected to grow significantly in the next few years. The airport is in the process of constructing a new aircraft maintenance hangar, and Warren County has leased land to private individuals for the construction of storage hangars for jet aircraft. Based on all of these factors, it is important that the airport extend the runway to meet the current and future demand of the aviation industry. While 7,500 feet of runway would be difficult due to physical and political constraints, an extension of Runway 1-19 from 5,000 to 6,000 feet is necessary for the airport and the community that it serves.